Variations in Observed Park Physical Activity Intensity Level by Gender, Race, and Age: Individual and Joint Effects

Andrew T. Kaczynski, Sonja A. Wilhelm Stanis, Tanis J. Hastmann, and Gina M. Besenyi

Background: Parks are important settings for physical activity (PA), but few studies have documented the actual behaviors of park users. The purpose of this study was to examine the individual and joint effects of various park user demographic characteristics on observed PA intensity levels. Methods: Four parks were observed using the System for Observing Play and Recreation in Communities. Observers recorded the age group, gender, race, and intensity level of all park users in 83 activity areas over two weekends at each park. Logistic regression examined whether male/White, female/White, and male/non-White users were more likely than female/non-White users to be observed engaging in moderate-to-vigorous PA (MVPA) rather than sedentary activity across 4 age groups. Results: In total, 8612 users were observed during the study. In the child age group, male/White users were significantly more likely to be observed in MVPA than female/non-White users. For teens, female/White and male/White users were less likely to engage in MVPA. For both adults and seniors, female/White and male/White users were more likely to be observed in MVPA. Conclusion: Observations revealed significant differences in intensity levels across gender, age, and race groups. Future interventions should emphasize park design that promotes increased MVPA among diverse groups.

Keywords: built environment, parks, observation, environmental justice

One mechanism to prevent obesity is to increase caloric expenditure via physical activity. In addition to obesity prevention, physical activity has implications for multiple chronic diseases, such as coronary heart disease, hypertension, metabolic syndrome, type 2 diabetes, and certain cancers.1–3 Objective measures of physical activity indicate that the population as whole (children, teens, adults and seniors), are not meeting recommendations.4 Additionally, physical activity has been shown to gradually decrease with age,5 and physical activity level during childhood predicts physical activity in adulthood.6 Disparities in physical activity by gender, race, and age are also evident.4

To impact physical activity participation at the population-level, researchers and professionals have frequently adopted social ecological models to guide health promotion efforts.7,8 These approaches emphasize the role of the built environment in providing positive behavior settings that can impact the physical activity opportunities of entire neighborhoods or communities.9,10 To improve health behaviors and outcomes, especially in areas where personal resources (e.g., income, social support) may be less prevalent, low-cost environmental solutions are needed. To that end, parks are increasingly acknowledged as important physical activity resources in communities because of their legislated ubiquity and relatively low cost of service provision.11,12

Indeed, numerous studies have documented the relationship between parks and physical activity.13 In one review, 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 participants’ physical activity levels.14 In other recent studies, both park users and neighborhood residents stated that nearby parks were their most common places for exercise.15,16 Numerous other studies have reported positive relationships between park proximity and increased physical activity or reduced obesity among both adults and children.17–25

However, better realizing the potential of parks for physical activity promotion requires an understanding of how they are used by different groups. A growing body of research has explored park visitors’ motivations and constraints to park use and physical activity,26–28 as well as the various behaviors that occur in such settings (e.g., activities) and related physiological and psychological responses (e.g., stress reduction).29,30 However, to date, relatively few studies have attempted to document the
actual physical activity behaviors of park users. In one study, Cohen et al. recorded between 524 to 4628 observations in each of 8 parks in Los Angeles over the course of a week. Of all observed park users, 66% were sedentary, 19% were walking, and 16% were engaged in more vigorous activity. The average estimated MET value for park users was 2.5, which is slightly less than the lower boundary of usual classifications (3.0–6.0 METs) for moderate-intensity physical activity. In another study across 28 parks in Tampa and Chicago, Floyd et al. observed that 65% of park users were sedentary, while 23% were walking and 11% were engaged in vigorous activity. Shores and West observed 2113 park users in 4 small suburban parks in an eastern U.S. city. They reported that 34% of users were sedentary, while 21% and 45% were engaged in moderate and vigorous activity, respectively.

Research shows that perceptions of important park features, park characteristics, and outdoor recreation constraints differ by gender, age, and race. However, within the aforementioned park observation studies, few have reported variations in park physical activity levels by gender, age, or race, let alone by several user characteristics combined. Two studies reported that children were more likely to be observed being active than adults, while others reported that males were more likely to be engaged in moderate or vigorous activities than females. With respect to race, Hutchinson’s study of 18,000 park user groups reported that mobile activities (e.g., walking, dog, jogging) were observed in 52% of White groups, 50% of Black groups, and 25% of Hispanic groups, while the proportions of observations for sports (e.g., tennis, basketball) for Whites, Blacks, and Hispanics were 10%, 12%, and 20%, respectively. However, to the authors’ knowledge, no other study to date has examined park physical activity levels by race using systematic observation methods. In their park observation study, Floyd and colleagues described differences in activity levels within parks located in neighborhoods of varying racial/ethnic and income composition, but they did not record or report on the race/ethnicity of park users themselves.

**Purpose**

In summary, given that research has shown gender, race, and age to be associated with diverse factors related to park use, the purpose of the current study was to examine the individual and joint effects of various park user demographic characteristics (i.e., gender, race, and age) on observed physical activity intensity levels. Examining park-based physical activity by gender, race, and age provides important information for better understanding the influence of these demographic characteristics on park-based activity in particular. Further, this information is valuable to better tailor strategies and interventions to improve park-based physical activity across all park users.

**Methods**

**Study Setting**

This study was part of a broader pilot investigation of psychological and behavioral responses to park environments that occurred in 4 parks in Kansas City, Missouri during July and August 2009. In consultation with staff from the local parks and recreation department, the 4 parks were selected based on geographic proximity (all within the central region of the parks system), that they were each a manageable but still substantial size (26, 38, 74, and 129 acres), and because they each contained a variety of features and amenities.

To facilitate observation of park users, the parks were each subdivided into observable target areas based on natural activity zones (e.g., tennis court) or sightline barriers (e.g., trees, hills). Once divided, the 4 parks contained 14, 20, 21, and 28 target areas that represented a range of types of spaces and potential uses (e.g., trail, playground, open space, picnic shelter, etc.).

**Measures**

The System for Observing Play and Recreation in Communities (SOPARC) was used to document the physical activity behavior of park users. As described below, SOPARC involves systematic scans rotating through park target areas to record the characteristics and behaviors of park users. Previous studies using SOPARC have provided evidence of its construct validity and reliability, and other studies have successfully employed SOPARC to examine park-based physical activity in a variety of populations and settings.

In this study, we used a modified version of the SOPARC observation form that permitted simultaneous recording of 4 characteristics for each park visitor: gender, age group, race/ethnicity, and intensity level. Gender was recorded as male or female. Consistent with previous SOPARC studies, age group was recorded as child (2–12 years), teen (13–20 years), adult (21–59 years), or senior (60+ years). Also consistent with SOPARC methodology, race/ethnicity was recorded as White, Black, Asian, Hispanic, or other/unsure. Finally, intensity level was recorded as sedentary (sitting, standing in place), moderate (walking slowly), or vigorous (engaged in an activity more vigorous than an average walk). Interrater reliability was established during staff training and then monitored throughout the study by having 2 observers conduct an average of approximately 20 concurrent observations of target areas per day. These observations revealed strong interrater reliabilities (0.84–0.98) for all recorded user characteristics.

**Data Collection**

Data were collected by 4 staff who received 2 days of classroom and on-site training. Given budget limitations and consistent with past research, study observations...
occurred on only Friday, Saturday, and Sunday. Each park was observed for a full 13-hour day based on daylight hours (7:00 AM to 8:00 PM), with these hours spread across 2 weekends during the study period (July–August). For example, park A may have been observed from 7:00 AM to 1:00 PM on one Friday and from 1:00 PM to 8:00 PM on a second Friday, with a similar schedule used for the other days and parks. Thus, in total, each park was observed for 39 hours across the course of the study. Observations were only conducted during element weather, with cancelled data collection periods rescheduled for identical replacement hours on subsequent weekends as necessary.

During each observation hour, observers moved through the park target areas recording the characteristics of park users (if present) from a designated and standardized observation location. Within each target area, observation sweeps were made from left to right and the users’ characteristics (ie, gender, age group, race, and intensity level) were momentarily captured and recorded. As necessary based on the volume of users in a target area, multiple disaggregated sweeps were made (eg, females then males) and/or a target area was subdivided into a more manageable observation zone (eg, 2 halves of a volleyball court). Based on a total of 83 target areas and 39 hours per park, 3237 total scans were expected (39 per target area). However, due to the length of some rotations through the park, safety concerns in certain areas during particular hours, or minimal weather interruptions, a small number of park target areas were not observed as scheduled. In total, 3125 park target area scans were completed during the course of the study during which 8855 park users were observed.

Analysis

We employed a 2-step process to examine the individual and joint effects of various park user demographic characteristics on observed physical activity intensity levels. For the individual effects, descriptive statistics were initially used to report the number of park users observed within each gender, age, race, and intensity level category. As well, chi-square analyses compared the percentage of park users engaged in moderate-to-vigorous physical activity within the different gender, age, or race groups.

We then explored the joint effects of gender and race on participation in park-based physical activity among park visitors from each age group. For this analysis, all observed users were recoded as White or Non-White. The latter category included users originally recorded, following McKenzie et al’s guidelines, as Black, Asian, or Hispanic, but who were collapsed together based on a fairly small representation of each group within the total sample (see Table 1). However, 243 users (2.7%) whose race was coded as ‘other/unsure’ were excluded from the present analyses, thus reducing our final sample size to 8612 useable observations.

Subsequently, 4 gender/race groups were created: male/White, male/non-White, female/White, and female/non-White. Logistic regression, controlling for the park in which the observation occurred, was used to examine whether park visitors in the former 3 groups were more likely to be observed engaged in moderate-to-vigorous physical activity (vs. sedentary activity) compared with female/non-White visitors. Female/non-White was chosen as the reference group given our expectation that this group would exhibit the lowest intensity levels of park moderate-to-vigorous physical activity based on previous research showing females and minorities to have lower rates of overall physical activity participation. These logistic regression analyses comparing the 4 groups were conducted separately for the 4 different age groups (child, teen, adult, senior). All analyses were completed using SPSS 17.0.

Results

Table 1 provides details about the 8612 park users included in our analysis. There were an equal number of female (50.1%) and male (49.9%) users observed, but the majority was adults (67.3%) or children (21.6%) rather than teens (5.7%) or seniors (5.4%). With respect to race, approximately two-thirds of park users were White (65.2%), with Black (18.0%) and Hispanic (15.2%) users well-represented, but few Asian visitors (1.6%). Just over half of all users (53.0%) were observed being sedentary, while 41% were engaged in moderate-intensity activity and 6% in vigorous activity.

Chi-square analyses suggested that a significantly greater percentage of males (48.6%) than females (45.5%) were observed engaged in moderate-to-vigorous physical activity ($\chi^2 = 8.40, P = .004$). There were also significant differences among the 4 age groups ($\chi^2 = 65.18, P < .001$), with children the most active (54.0%), followed by teens (52.5%) and seniors (50.9%), and adults as the least active group (44.0%). For race/ethnicity, the small number of Asian visitors in our sample had the greatest percentage of active users (56.9%), followed by White (48.2%), Black (44.5%), and Hispanic (43.9%) users, respectively ($\chi^2 = 17.57, P = .001$). Significant differences were also observed ($\chi^2 = 9.01, P = .003$) when simply comparing the total percentage of White (48.2%) vs. Non-White (44.8%) users who were active.

We also wished to examine joint effects of gender, race, and age. Figure 1 depicts the percentage of park users within each age and gender/race group who were observed engaged in moderate-to-vigorous physical activity (MVPA). For all age groups except teens, male/White visitors had the greatest percentage of users engaged in MVPA. The gender/race group with the lowest percentage of users engaged in MVPA varied across age groups, ranging from female/non-White users for adults and seniors, to female/White users for children, and male/White users for teens. Table 2 shows odds ratios testing whether certain gender/race groups were more likely to
be observed engaging in MVPA rather than sedentary activity (with female/White as the reference group for all comparisons). In the child age group, relative to female/non-White, male/White users were significantly more likely to be observed engaged in MVPA (OR = 1.46, 95% CI = 1.12–1.91). For teens, female/White (OR = 0.50, 95% CI = 0.29–0.89) and male/White (OR = 0.49, 95% CI = 0.28–0.85) users were less likely to be observed engaged in MVPA than female/non-White users. Among adults, female/White (OR = 1.36, 95% CI = 1.15–1.61) and male/White (OR = 1.45, 95% CI = 1.23–1.72) users were more likely to be observed participating in MVPA. Likewise, for seniors, female/White (OR = 3.15, 95% CI = 1.23–7.72) and male/White (OR = 4.23, 95% CI = 1.78–10.35) users were more likely to be observed engaged in MVPA.

Finally, because the previous findings generally suggested that both male and female White users were more likely to be active than female/non-White users, we conducted an additional analysis to further clarify the role of gender and race in predicting park-based MVPA. Specifically, we used logistic regression to compare whether female/White visitors were more likely to be observed being active than male/non-White visitors (reference group). Within the adult (OR = 1.29, 95% CI = 1.10–1.50) and senior (OR = 3.04, 95% CI = 1.27–7.29) age groups, female/White park visitors were indeed significantly more likely to engage in MVPA than male/non-White visitors. However, there were no differences between the female/White and male/non-White users for the full sample (OR = 1.02, 95% CI = 0.90–1.15) or among teens (OR = 0.69, 95% CI = 0.41–1.12). Finally, among children, female/White visitors were less likely to observed in MVPA than male/non-White visitors (OR = 0.66, 95% CI = 0.51–0.86).

Discussion

Parks are recognized as important behavior settings for physical activity.11,14 While considerable previous research demonstrates that persons living closer to parks are generally more active, few studies have explored
Table 2 — Associations Between Gender/Race and Age Groups and Moderate-To-Vigorous Physical Activity Participation in Parks

<table>
<thead>
<tr>
<th>Gender/race group</th>
<th>N</th>
<th>Full sample OR (95%CI)</th>
<th>Child OR (95%CI)</th>
<th>Teen OR (95%CI)</th>
<th>Adult OR (95%CI)</th>
<th>Senior OR (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male White</td>
<td>2675 (30.2%)</td>
<td>1.32* (1.16–1.51)</td>
<td>1.46* (1.12–1.92)</td>
<td>.49* (.28–.86)</td>
<td>1.45* (1.22–1.73)</td>
<td>3.15* (1.29–7.73)</td>
</tr>
<tr>
<td>Female White</td>
<td>2939 (33.2%)</td>
<td>1.11( .98–1.27)</td>
<td>.87 (.67–1.13)</td>
<td>.51* (.29–.89)</td>
<td>1.36* (1.15–1.61)</td>
<td>4.29* (1.78–10.35)</td>
</tr>
<tr>
<td>Male Non-White</td>
<td>1551 (17.5%)</td>
<td>1.15 (1.00–1.33)</td>
<td>1.28 (.98–1.66)</td>
<td>.70 (.93–1.26)</td>
<td>1.17 (.97–1.42)</td>
<td>1.10 (.36–3.37)</td>
</tr>
<tr>
<td>Female Non-Whitea</td>
<td>1447 (16.3%)</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td></td>
</tr>
</tbody>
</table>

* Reference group for all analyses.
* Indicates odd ratio significantly different from reference group at \( P < .05 \) level.

differences in the activity levels of visitors to parks. Therefore, the primary aim of this study was to examine the individual and joint effects of various park user demographic characteristics on observed physical activity intensity levels.

Within our 4 study parks, the observed users were fairly representative of the larger population of Kansas City, Missouri. Similar to the city’s even gender distribution (50.3% female), 50.1% of our observed sample was female. Further, 27.3% of our observed users were children or teens, just slightly less than the 32.3% of the Kansas City population under the age of 18 years old. Finally, our observed sample was slightly more racially/ethnically diverse than the overall population (65.2% White in our sample versus 78.2% in Kansas City; 18.0% vs. 5.9% Black; 15.2% vs. 10.5% Hispanic; and 1.6% vs. 1.0% Asian).

Our study found that the majority of all users (53%) were observed being sedentary, while 41% were engaged in moderate-intensity activity, and 6% in vigorous...
activity. These proportions are comparable to previous park observation research, such as Cohen et al’s study which found that 66% of observed users were sedentary, 19% walking, and 16% vigorous.15 and Floyd et al’s study that observed 65% of users were sedentary, 23% walking, and 11% vigorous.31 However, a slightly greater proportion of park users in the current study were observed in physical activities than in previous studies, which may be explained by a variety of factors (park user characteristics, park setting attributes, etc.). Nevertheless, given that more than half of the park visitors were engaged in sedentary behaviors, substantial opportunities remain to increase the number of users who are active during their visits and/or the amount of time visitors spend engaged in active behaviors while at the park.

Individual Effects of Gender, Race, and Age on Park-Based Physical Activity

We expected males to be more active than females as SOPARC observations from Cohen et al. found that males (19%) were more likely to be engaged in vigorous activity than females (10%).15 Additionally, there is a plethora of evidence to support that males are more active than females in general.47–49 Indeed, in our study, a greater percentage of males than females were engaged in MVPA. Therefore, this speaks to the importance of indentifying features that are important for, as well as constraints to, females’ physical activity in parks. Previous research indicates that women are generally more constrained than men in their leisure by factors such as fear of crime.37,50 although additional research specifically focused on women’s constraints to park-based physical activity will provide more insight into such factors.

Overall, children and teens were the most physically active users. This finding is similar to Floyd et al’s study in which children were more likely to be observed being active than adults.31 This is perhaps not surprising as previous research indicates that physical activity levels decline with age.3 However, other qualitative research has documented teens’ perceptions that most parks contain little appeal for users of their age group.51 Consistent with this notion, very few teens were actually observed in our 4 study parks (n = 495; 5.7% of all users), but those who were present were observed being relatively active (52.5% MVPA). Thus, future research should explore what elements of parks contribute to both attracting teens to parks and to facilitating greater levels of physical activity once they are there. For example, one study found that adolescent girls who lived near parks containing little appeal for their age group.51

Our results indicate differences in physical activity levels by race/ethnicity. Overall, White users were more active than non-White users. Likewise, when comparing across the individual race/ethnicity groups, a greater percentage of White users were active than Black and Hispanic users, although Asian visitors had the greatest proportion of active users. Park physical activity levels by ethnicity show an inconclusive relationship based on recent evidence. For example, Floyd and colleagues found that neighborhood race/ethnicity was not associated with physical activity in one of their samples, while in their other sample, park users in mostly Hispanic areas were more likely to be observed walking than park visitors in mostly White areas.31 Similarly, Carlson and colleagues found that compared with non-Hispanic Blacks, non-Hispanic Whites were more likely to report an active park visit.35 However, the same study found that Hispanic and non-Hispanic park users were equally likely to report an active park visit. It could be that different race/ethnicities are attracted to parks for different reasons in that White park users may visit a park to be physically active, while non-White users may be attracted to parks for sedentary activities (eg, picnics, relaxing in the grass). Indeed, Wilhelm Stanis et al found that main activities for Hispanic/Latino park visitors were playing with kids and relaxing, while the main activities for White visitors were walking/hiking and dog walking.53 Research also suggests that different race/ethnicities experience different constraints to park-based physical activity, with constraints generally greater for racially/ethnically diverse respondents.33,37 Future research should continue to explore the physical, cultural, or social factors that contribute to differences in physical activity levels within parks across persons from varied backgrounds.

Joint Effects of Gender, Race, and Age on Park-Based Physical Activity

We also wished to understand the joint effects of multiple sociodemographic characteristics on observed park-based physical activity. Specifically, we examined, across 4 age groups, whether park visitors within 4 gender/race groups differed with respect to their likelihood of engaging in MVPA. Based on previous evidence,46 we hypothesized that female/non-White patrons would be the least active across all age-groups and these visitors were therefore used as the reference group. Indeed, male/White children, male/White adults, female/White adults, male/White seniors, and female/White seniors were all more likely to be engaged in MVPA compared with female/non-White users within their respective age groups. No past SOPARC studies of which we are aware have examined multiple park visitor characteristics simultaneously.

Conversely, among teens, female/White and male/White users were less likely to be observed engaged in MVPA compared with female/non-White teens. This finding contrasts with previous evidence showing White high school students to have a higher prevalence of meeting physical activity recommendations than non-White
students. It is possible that certain attributes specific to parks mean that minority teens are more likely to achieve physical activity in these outdoor settings rather than in the broader contexts in which overall recommendations are measured. For example, compared with other physical activity opportunities (eg, private facilities or organized sports), parks are part of the public domain, are usually free to access, and are well-distributed throughout communities thus mitigating transportation concerns. However, given the limited number of teens observed in our study (n = 495; 5.7%), these findings and explanations should be interpreted with caution. Although past qualitative research suggests teens view parks as having limited opportunities for them, these resources should nevertheless be investigated further as community assets that might stem age-related declines in physical activity.

As our initial logistic regression largely showed that male and female White users were more likely to be active than female/non-White users (except among teens), we conducted an additional analysis comparing female/White visitors and male/non-White visitors to further clarify the role of gender and race on park-based physical activity. We found that among children, female/White visitors were less likely to be observed in MVPA than male/non-White visitors, indicating that for children, gender may be a particularly relevant factor in their park-based physical activity. In broader contexts, male children achieve greater physical activity levels than females, but future research should explore why such gender disparities persist in parks and why, at least among youth, race appears to be less of a factor for park-based activity.

For adults and seniors, however, female/White park visitors were more likely to engage in MVPA than male/non-White visitors, suggesting that while several demographic characteristics appear to influence park users’ behaviors, race may be a particularly important factor in understanding levels of park-based MVPA among adults. Indeed, other past research has reported different types and intensities of activities among park users from different backgrounds. For example, in one study, compared with non-Hispanic Whites, non-Hispanic Blacks were less likely to engage in moderate activities while visiting a park, such as walking/hiking, but more likely to report attending a gathering with family and friends, running/jogging, and playing sports. The latter 2 findings contrast with our present results, but it is notable that in that study, more intense activities such as running/jogging and playing sports were reported much less often by all respondents compared with more sedentary pursuits such as relaxing, picnicking, attending an outdoor event, or attending a family gathering, or moderate activities such as walking/hiking. Other studies in Chicago parks have also reported differences in activity modes and intensities between different races or ethnicities, with minority participants generally less active than White individuals.

One possible explanation for differences in park-based physical activity by race/ethnicity may be the idea of deprivation amplification or disparities in access to environmental resources such as parks. Several studies have concluded that areas with higher concentrations of minority and/or low-income populations generally have fewer parks and recreation resources and/or those resources are in poorer condition. This lack of availability or exposure could lead to a reduction in the value of park-based physical activity by certain racial/ethnic groups. In addition, poor access could reduce the total number of minorities visiting a park and hence alter the social context for group participatory physical activities therein. Future studies should explore the amount and intensity of park-based physical activity among racial/ethnic minorities in areas where parks are less prevalent or in parks with lesser or greater proportions of minority visitors.

**Study Strengths and Limitations**

This study had several strengths and limitations. First, our study was conducted in only 4 parks, which is the same as a recent paper by Shores and West, but fewer than Cohen et al and Floyd et al who studied 8 and 28 parks, respectively. Nevertheless, our analyses are based on a fairly large sample of observed park users (N = 8612), which is less than Cohen et al’s study (N = 14,791), but comparable to Floyd et al’s study (N = 9456) and more than Shores and West’s study (N = 2113). We also recorded park user intensity levels by multiple sociodemographic characteristics simultaneously, whereas all previous park physical activity observation studies have examined user characteristics such as gender or age independently, and none have reported intensity levels according to race/ethnicity. Moreover, for each recorded user characteristic, our observations demonstrated strong interrater reliability.

At the same time, because of the lesser number of non-White park users that were observed and our desire to analyze only 4 gender/race groups (rather than 8 or more), we opted to aggregate Black, Hispanic, and Asian users into a single group. However, we recognize that this ignores important differences in physical activity and park use patterns among these minority groups and future park observation studies that capture greater diversity within a large sample may wish to explore differences between these populations. Likewise, we recorded all Hispanic users (White and Non-White) within a single category, but this decision was made to maintain consistency with SOPARC procedures and past and future SOPARC studies. As well, our observations of visitors’ gender, age, and race were found to be highly reliable across observers, but future studies may wish to incorporate self-reports from park users to enhance the validity of such recorded characteristics. Our observations were also not disaggregated by target area of the park, as has been reported in at least 1 previous study, because our focus was on differences in intensity levels of users by gender and race rather than between park settings. However, because we always used the female/non-White group as the reference group in our analyses, we did not explore potential differences between other gender/race groups.
that may be of interest. As well, we did not examine characteristics of the park or the surrounding neighborhood which may be important influences on park-based physical activity. Future studies should explore factors such as park features, quality, access, and safety and how they relate to observed physical activity among park visitors from various gender, age, and race groups. Finally, some double-counting of park visitors is possible (eg, if they move between park areas quickly or stay in the park for more than an hour) and future research should examine the extent to which this is common (and how much of a concern it is) in SOPARC-based studies.

Conclusion

Our study revealed important differences in park-based physical activity levels according to gender, race, and age. Better understanding these uneven patterns is a key first step toward improving how parks encourage physical activity and health among diverse groups of users and nonusers. Such disparities may be an artifact of a broader issue related to environmental justice. Environmental justice concerns the equitable distribution of health resources and outcomes in communities and much research has explored such concerns in relation to physical activity settings. Although many authors conceptualize environmental justice in the context of race/ethnicity or income level, it can be also an issue with respect to other population attributes, including gender and age. Given their legislated availability across most communities, their free access, and their reputation as public goods, parks should be promising mechanisms for facilitating health-related environmental justice, especially in lower-income areas. However, our research suggests that park users from certain gender, race, or age groups gain differential levels of physical activity during park visits. As discussed above, this could be a function of the nature of the 4 parks we examined. Thus, given documented disparities in access to parks and the facilities, amenities, and quality within them, future research should investigate the physical activity behavior of diverse groups within specific activity areas of parks. Future research should also simply explore the active and sedentary behavior of visitors according to gender, race, and age within a greater number of parks and neighborhoods. Furthermore, better understanding the intrapersonal, interpersonal, cultural, structural, and policy-related factors that influence park-based physical activity for diverse users (via surveys, interviews, etc.) should be a priority to help inform park managers’ efforts toward creating more inclusive, health-promoting settings. Based on our data as a starting point, such efforts may include targeting parks toward minority youth and teens through their geographic location and design to capitalize on the higher levels of park-based MVPA among these groups that we observed. Further, culturally-tailored programming in parks may facilitate increased active pursuits therein. Finally, similar to what has been done successfully in indoor settings, using point-of-decision prompts and other signage and persuasive communications to promote the benefits of and opportunities for physical activity in parks may prove to be an effective and efficient strategy for reducing rates of sedentary activity among park visitors. Parks can make significant contributions to improving public health and first understanding and then influencing the active behaviors of park users is an important step toward maximizing this potential.

Acknowledgments

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