

Policy and Practice-Relevant Youth Physical Activity Research Center Agenda

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Background: The Physical Activity Research Center developed a research agenda that addresses youth physical activity (PA) and healthy weight, and aligns with the Robert Wood Johnson Foundation's Culture of Health. This paper summarizes prioritized research studies with a focus on youth at higher risk for inactive lifestyles and childhood obesity in urban and rural communities. **Methods:** Systematic literature reviews, a survey, and discussions with practitioners and researchers provided guidance on research questions to build evidence and inform effective strategies to promote healthy weight and PA in youth across race, cultural, and economic groups. **Results:** The research team developed a matrix of potential research questions, identified priority questions, and designed targeted studies to address some of the priority questions and inform advocacy efforts. The studies selected examine strategies advocating for activity-friendly communities, Play Streets, park use, and PA of youth in the summer. A broader set of research priorities for youth PA is proposed. **Conclusion:** Establishing the Physical Activity Research Center research agenda identified important initial and future research studies to promote and ensure healthy weight and healthy levels of PA for at-risk youth. Results will be disseminated with the goal of promoting equitable access to PA for youth.

Keywords: exercise, obesity, health disparities

In the United States, nearly 1 in 3 young people is overweight or obese. Lower-income toddlers, children, and adolescents in historically underserved populations—African American, American Indian, Latino-Hispanic, and subpopulations of Asian Americans and Pacific Islander cultures—are at highest risk.^{1,2} The same populations often have limited access to safe places and quality programs for physical activity (PA).³ To help ensure that children grow up at a healthy weight, *daily* or *regular* PA is recommended.⁴ Improvements in PA environments in neighborhood settings, where children spend large amounts of time, such as schools, child-care facilities, and parks, as well as changes to local, state, and federal policies, have the potential to reduce sedentary behavior and increase PA. Environment and policy changes are recommended by the Institute of Medicine and others as critical components of obesity prevention because of their population-wide reach and long-term effectiveness.^{5–8} However, further research is needed to determine how best to reduce rates of obesity, increase PA, and ensure equity in opportunities for healthy lifestyles.

PA during childhood and adolescence has positive effects on numerous physical and mental health indicators, such as weight gain prevention, lower body fat, higher cardiovascular and musculoskeletal fitness, lower risk factors for chronic diseases of

adulthood, and fewer symptoms of depression and anxiety.⁴ Physically active students perform better in school, likely due to multiple benefits on brain structure and function.^{9–11} This evidence highlights the need to promote healthy lifestyles and opportunities for safe and age-appropriate PA for all children. Communities of color, communities with high poverty levels, and communities with low access to healthy foods and PA-friendly environments bear the greatest cost of the growing health inequalities.¹² The Robert Wood Johnson Foundation (RWJF) developed a Culture of Health framework that illustrates a comprehensive approach to providing the conditions for equitable population health.¹³ Building a Culture of Health means that health is seen as a shared core value, multiple sectors collaborate to improve the conditions necessary for health, every community provides its members with equitable opportunities to engage in healthy behaviors and access health care, and prevention and health care services are integrated into efforts to improve the health of communities. The Culture of Health framework applies well to promoting PA, which requires coordination across diverse sectors of society to create environments and policies that facilitate active lifestyles.

Childhood obesity statistics consistently show disparities among lower-income minority groups. In 2011–2014, the obesity rate for non-Hispanic white youth aged 2–19 years was 14.7%, but it was 19.5% among non-Hispanic African American youth and 21.9% among Hispanic youth.¹⁴ Although the obesity rate for non-Hispanic Asian youth over the same period was 8.6%, variations exist within the 20 national origins represented in the United States, with Filipinos, Southeast Asians, and Asian Americans being 4 times more likely to be overweight than Chinese 12- to 17-year-olds.^{2,14} Obesity rates among American Indians and Alaska Native youth range from 25% to 31%, depending on the age group.¹⁵ Although disparities are still present, collaboration among diverse institutions at the local level—such as government agencies, hospitals, school districts, nongovernmental organizations, and

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faith-based organizations—have proven effective in transforming lifestyles.¹² A major concern, however, is that racial and ethnic disparities have widened, even in communities where progress has been made.¹²

In response to the uneven progress in childhood obesity and evidence of widening inequalities, the RWJF issued a request for proposals (RFPs) to develop a targeted research program. This research program is intended to build an evidence base of policies; practices (at the organization, local community, state, and federal levels); and aspects of the built environments that promote safe and developmentally appropriate PA for toddlers, children, adolescents, and their families. Through evidence-based strategies, RWJF aims to ensure that PA becomes the daily routine for all youth—particularly those at greatest risk of becoming overweight or obese—and in every setting in which they live, learn, and play.

The RFP was distributed to a limited group of investigators and a national panel of experts reviewed the submissions. The team of authors of this paper (from the University of California San Diego, Georgia Institute of Technology, Johns Hopkins University, and North Carolina State University) was awarded a 6-month planning grant that included submission of a joint proposal for conducting multiple research studies under the name Physical Activity Research Center (PARC).

The goal of PARC is to build evidence to identify policies, practices, and aspects of the built environments that promote safe and equitable opportunities for developmentally appropriate PA for youth and their families. The program's objectives are to:

- develop a prioritized research agenda using a systematic process;
- conduct targeted studies that inform RWJF's actions to promote the health and wellness of children;
- commission and manage targeted research grants on time-sensitive topics to meet the information needs of the RWJF advocacy program, Voices for Healthy Kids (VFHK), and its grantees;
- translate research into communication products for non-research audiences to help accelerate the application of research into practice; and
- periodically update the PARC research agenda based on new information and opportunities.

This article presents a systematically developed research agenda for youth PA and describes studies being conducted by the PARC research team (RT). The research agenda—designed to contribute to efforts to increase PA, ensure equity in opportunities for healthy lifestyles, and create conditions for children's healthy weights—may be of use to investigators and research funding organizations with related goals.

Developing the Research Agenda

In 2016, with input from the RT, external advisors, and RWJF partners, the proposed research agenda for PARC was determined. The planning process selected high-priority research questions and developed a youth PA research agenda. From this agenda, each RT selected 1 high-priority question and then designed a study to address that question.

The authors collectively designed this multistep process to develop a research agenda that (1) prioritizes gaps in knowledge important for advancing policy and practice and (2) has the

potential to increase PA of young people and reduce inequalities in opportunities. The RT agreed in advance on several principles to guide development of the research agenda. These notions were consistent with Brownell and Roberto's concept of "strategic science," defined as "research designed to address gaps in knowledge important to policy decisions, derived from the reciprocal flow of information between researchers and policymakers, and communicated not only in scholarly publications but also in forms relevant to policy makers."¹⁶ First, the intent of the research was applied, with the goal of producing "actionable" results that could inform policy and practice interventions. Second, emphasis was placed on identifying promising solutions likely to be well suited to understudied groups at higher risk of physical inactivity and obesity, including youth of minority ethnic and racial groups and all ethnic and racial groups living in rural areas. Third, the research agenda would focus on a limited number of topic areas that are promising but understudied, within categories identified by RWJF in the RFP. An important intended audience for research results was VFHK, a collaboration between RWJF and the American Heart Association. VFHK identifies promising policy strategies and provides grants to advocacy groups to implement policy change campaigns (the latter using American Heart Association funds only). The topic areas are:

- pregnancy and maternal health;
- infant, child, and adolescent development;
- behavioral economics;
- role of health care providers and the health care system;
- role of business and industry;
- out-of-school time;
- transportation, land use, urban design, and communities setting; and
- parks, recreation, trails, and open spaces.

Search for Literature Reviews and Authoritative Reports

The first step in creating a research agenda was for the RT to conduct a nonsystematic search for recently published literature reviews and authoritative reports relevant to youth PA, which were likely to contain recommendations for research. Each RT member contributed to the search; research recommendations were extracted from the reports. A research gap analysis conducted by VFHK, with input from diverse advocates and researchers, was included as a key document. Selected sources from this process are provided in an online appendix available on the PARC website (<https://paresearchcenter.org>). This helped to separate known facts in promoting youth PA from areas in need of further research.

Online Survey of Experts

Next, the RT conducted an online survey to obtain broad input on the selected topic areas and priority populations. RT members and RWJF staff identified experts with backgrounds in advocacy, practice, and community action to comment on the practice and policy relevance of topic areas. Experts in each of the priority populations were also surveyed, along with a smaller number of researchers. The survey asked the experts to explain the most important research and information needs about youth PA in their areas of expertise. In addition, researchers were asked to identify the most promising policies, practices, and built environment features that

appear to promote safe and developmentally appropriate PA but remain inconclusive. Within this list, researchers noted what would have the “most immediate impact,” the “greatest long-term impact,” and would lead to “more equitable opportunities for children’s PA.” To supplement the RT’s search, researchers also identified articles and reports with relevant research recommendations and names of scholars most qualified to lead the types of studies the survey respondents recommended. The online survey was completed by 76 experts, the results were compiled by topic area, and similar ideas were combined. Respondents proposed about 45 different research ideas.

In-Person Meeting With Experts

To prioritize specific study questions in each topic area and each priority population, and to propose study designs and methods, a 1-day in-person meeting was held to obtain additional input from a selected group of experts. Participants (including some RT members) were leading researchers with expertise in each topic area, a mix of researchers and practitioners with expertise in the priority populations (eg, African American, Asian American, Pacific Islander, Native American, Latino), RWJF staff, VFHK staff, and a collaborator from the Centers for Disease Control and Prevention who joined the team after funding was obtained. Nineteen people attended the meeting, some by telephone. The input of 3 key experts who were not able to participate was obtained by telephone after the in-person meeting. Participants from this meeting and the follow-up phone calls are listed in Table 1.

The goal was to identify 3 to 5 specific research questions in each topic area, with suggested study designs and methods for

some of the research questions. Experts were informed about time and budget guidelines of the PARC research, to keep input focused on feasible priorities and projects. Attendees reviewed the summary of research ideas from the literature search and online survey, and then commented on proposed study questions and methods for each topic area.

Selecting Study Questions

The RT used the resulting research agenda (see Table 2) to select high-priority study questions in each topic area. These were then developed and integrated into a proposal to RWJF. A 2-day meeting and writing retreat was attended by RT members, RWJF staff, the Centers for Disease Control and Prevention advisor, and VFHK staff.

The meeting had 2 goals. The first goal was to determine which studies were highest priority, how many studies would be proposed, and if any new RT members would be recruited (as collaborators or as new members) to lead a study. Decision making about highest-priority studies was aided by completion of a matrix, in which each RT member rated a study idea on 10 weighted criteria that reflected PARC’s mission as articulated and clarified by RWJF. The weights were collectively agreed upon by the RT with input from experts at the 1-day Washington, DC meeting and RWJF staff. The criteria were as follows:

- (1) potential impact on reducing childhood obesity (weighted 3×),
- (2) potential impact on reducing disparities and addressing equity for children (weighted 3×),

Table 1 Advisors of PARC During Planning Grant

Advisor	Organization	Expertise
Jill Birnbaum	Voices for Healthy Kids	Cross-cutting
Stephen Cook	University of Rochester Medical Center	Health care providers and business/industry
Kristen Copeland	Cincinnati Children’s Hospital Medical Center	Infant, child, and adolescent development (includes school setting)
Carter Headrick	Voices for Healthy Kids	Cross-cutting
Valarie Jernigan	University of Oklahoma Health Sciences Center	Disparities/Native American populations
Michelle Mottola	University of Western Ontario, Exercise and Pregnancy Lab	Pregnancy and maternal health
Norma Olvera	University of Houston, Comparative Cultural Studies	Disparities/Latino populations
Jim Pivarnik	Michigan State University, College of Human Medicine	Pregnancy and maternal health
Amelie Ramirez	Salud America! University of Texas Health Science Center, San Antonio	Disparities/Latino populations
Brian Saelens	Seattle Children’s Hospital, Center for Child Health, Behavior and Development	Behavioral economics
Tom Schmid	Centers for Disease Control and Prevention	Cross-cutting
Matthew Trowbridge	University of Virginia School of Medicine	Infant, child, and adolescent development (includes school setting)
Renee Umstadd Meyer	Baylor University	Disparities/rural populations
Jean Wiecha	RTI International	Out-of-school settings
Nsedu Obto Witherspoon	Children’s Environmental Health Network	Cross-cutting
Stella Yi	New York University School of Medicine	Disparities/Asian American and Pacific Islander populations

Abbreviation: PARC, Physical Activity Research Center. Note: The group of individuals with expertise in key topics and high-risk race/ethnic groups participated in in-person or phone meetings to provide expert input into identifying and refining PARC’s high-priority research topics.

Table 2 PARC Research Agenda

Parks	<ol style="list-style-type: none"> (1) How do different race/ethnic groups use parks/trails to be physically active, especially children? What is the role of programming and promotion? (2) What is the role of parks and recreation centers in summertime PA, especially when connected with summer meals programs in parks? How can these programs address youth PA while families pick up meals?
Transportation, land use, urban design, and communities setting	<ol style="list-style-type: none"> (1) How do Play Streets promote PA in elementary and middle school-aged kids, among different racial/ethnic groups living in lower-income rural communities? Does offering rural communities mini-grants help to create culturally relevant Play Streets targeted to low-income children? (2) What kind of training can support the use of middle-school students to be advocates for PA in their communities? How does advocacy curriculum impact youth abilities to advocate for PA and related policy, systems, and environmental change across racial and ethnic groups in urban and rural communities? How does this impact PA levels?
Out-of-school time	<ol style="list-style-type: none"> (1) Which settings (hospitals, park programming, etc) provide the best opportunity to engage and reach high-risk children in need of summer care? What is the impact of year round schools on summer months on PA? (2) Compare states with and without PA requirements in Quality Rating Improvement Systems. What is impact on children's PA? What is needed to get PA included in Quality Rating Improvement Systems?
Pregnancy and maternal health	<ol style="list-style-type: none"> (1) What are the patterns of use of exercise prescriptions for pregnant women and new mothers within the health system?
Infant, child, and adolescent development (including school setting)	<ol style="list-style-type: none"> (1) Does adding quality ratings around PA and Early Childhood Education increase preschool children's PA? What is the process for getting quality ratings on the agenda of Early Childhood Education settings? (2) Which settings have the greatest potential to increase the PA of middle school-aged children during the summer months and school year? (3) What is the efficacy of health impact assessments and other policy-relevant tools on scale-up of evidence-based interventions in tribal communities?
Health care/business/industry	<ol style="list-style-type: none"> (1) How have Community Health Needs Assessments/Community Health Improvement Plans addressed PA and the correlates of PA since the ACA? How could hospitals be convinced to include goals for community change for PA, for youth, and for equity and built environment?

Abbreviations: ACA, Affordable Care Act; PA, physical activity; PARC, Physical Activity Research Center.

- (3) implications for policy and practice (weighted 2×),
- (4) alignment with expertise of the RT (weighted 2×),
- (5) identifiable audience of decision makers,
- (6) addresses multiple subgroups,
- (7) fills a research gap,
- (8) how close the study is to implementation,
- (9) how innovative the study is, and
- (10) program or intervention sustainability.

The completed matrix was used to facilitate group consensus about the study question each RT would lead.

The second goal of the meeting was to create a detailed outline of designs and methods for each study. This process involved several rounds of team members meeting to draft outlines, discuss them with all attendees, and then revise. After the meeting, each RT drafted the text of their study proposal, incorporated it into the combined PARC proposal, and submitted it to RWJF for additional review and guidance on study implementation.

Summary of RT Studies

Following RWJF's additional review, the PARC research proposal was funded for 2.5 years, 2016–2019. The studies are to be completed and analyzed in 2 years, with the final 6 months devoted to communicating research findings to practitioners and advocates

who can apply them to practice and policy. All studies will be conducted in, or recruit participants from, lower-income communities; address multiple race/ethnic groups to include African American, Asian American, Pacific Islander, Native American, and Latino in urban and rural environments; and aim to contribute evidence to guide subgroup-tailored intervention approaches.

Findings: Existing Gaps or Limitations in Our Knowledge

Several noteworthy gaps exist in the literature about youth PA and childhood obesity. Our literature review found minimal research about the impact on rural youth of built environment design and modes of transportation. Little research was available, too, about the role of public transportation in youth PA.^{17–19}

Maintaining youth PA during extended periods of out-of-school time is critical to addressing childhood obesity.²⁰ Children's worsening obesity is associated with decreased PA during the summer months, although the reasons for this are not clearly understood.²⁰ Further examination of youth PA is needed to understand what opportunities and barriers exist by Socioeconomic status, race/ethnicity, or location.

A deeper look at PA in pregnancy and maternal health is needed, especially by race/ethnicity and Socioeconomic status.²¹ How premature birth weight affects youth PA is not well known, as many developmental factors play a role in youth weight.

Race/ethnicity, Socioeconomic status, maternal employment, and parental involvement and support are all related to a child's physical development and weight.^{22–24}

Further research is needed to examine the role of the home environment, family health history, and other social factors that affect youth PA and weight. The role of health care, industries, and businesses requires more focused examination.

Studies Being Conducted by PARC RT

Four studies are being conducted by the PARC RT to fill some of the gaps identified in the 8 topics listed in RWJF's RFP. The studies focus on 3 of the 8 areas: (1) out-of-school time; (2) transportation, land use, urban design, and communities setting; and (3) parks. The selection of these 3 areas was based on the scoring documented in Table 2, the available budget, and the feasibility of the research design. Summaries of these projects are described below. The projects are coordinated by University of California San Diego, which is also serving as the PARC Coordinating Center, assisting with logistics of the studies and other PARC activities. The Coordinating Center supports communications among RT sites, VFHK, and RWJF and facilitates dissemination of study results.

Out-of-School Time: Youth PA in Summer: Patterns and Disparities—University of California San Diego

Adolescents have lower levels of PA and more rapid weight gain in the summer when they are out of school. Some evidence shows widening race/ethnic disparities during the summer,^{25–29} which is unexpected because children should have more time for PA during the summer. Given disparities in summer weight gain, it is important to understand PA patterns, opportunities, and barriers for the major race/ethnic subgroups, to inform possible solutions tailored to these subgroups. Rural youth also are at high risk for inactivity and obesity, and their PA patterns are understudied in general.^{30–32}

The primary aim of this study is to compare PA patterns and places where PA occurs during the school year and the summer, among diverse adolescent subgroups. The target population is adolescents living in lower-income areas in all major US race/ethnic groups: African American, Latino, American Indian, Asian, Pacific Islander, and non-Hispanic white. The 3 largest race/ethnic groups will be studied in both urban/suburban and rural settings. Forty adolescents in each of 9 race/ethnic/urbanicity groups (11–17 y old; total $n = 360$) will be recruited and measured during the school year and during summer break.

PA will be objectively assessed using 7 days of monitoring with accelerometers. Participants will be surveyed about preferred activities, sedentary behaviors, and places for PA; perceived PA barriers and opportunities; and demographic information. Comparisons will be made across 3 dimensions: (1) summertime versus school year, (2) race/ethnic subgroups, and (3) urban/suburban versus rural residence.

Study findings will be the basis for subgroup-specific recommendations for policies to promote summertime PA, especially in high-risk groups. Research briefs, webinars, and infographics will be distributed to advocacy, social justice, recreation, and pediatric audiences. By studying how and where children from specific ethnic/racial/geographic subgroups are active and inactive during the school year and the summer, potential policy and environmental changes tailored to specific groups can be identified.

Transportation, Land Use, Urban Design, and Communities Setting: PA Advocacy Training Among Youth in Lower-Income Racial and Ethnic Minority Communities—Georgia Tech

Previous studies on youth PA promotion focused on education, programming, and environmental change, with substantial evidence that many approaches can be effective.³³ However, few effective interventions have been scaled up, and disparities remain in PA and obesity.¹² The challenges to advance PA for lower-income racial and ethnic minority youth likely require solutions that have not yet materialized for these vulnerable groups.³⁴ One such intervention (initially used in tobacco control) is youth advocacy for environment and policy change. Results from previous work on tobacco youth advocacy showed improvements in smoking prevention, self-efficacy, and barriers to prevention.^{35–39} Similar approaches to obesity-related advocacy training for youth are promising.⁴⁰ An important next step is to evaluate how youth advocacy for PA promotion training affects youth, adult leaders, and decision makers across race/ethnic groups and urban/rural settings. The Youth Engagement and Action for Health (YEAH!) curriculum is an 8- to 10-week group-based program designed to help youth advocate for policy, systems, and/or environmental changes that can promote PA and healthy eating. Given its potential effectiveness but limited evaluation, youth advocacy for PA promotion through an adapted YEAH! curriculum builds on this foundation and could address disparities among lower-income racial and ethnic minority youth.⁴¹

This study examines how an adapted YEAH! curriculum impacts middle school-aged participants in community-based youth-serving organizations, including Boys and Girls Clubs. This research evaluates how youth advocacy training affects African American, American Indian, Latino, Asian, and Pacific Islander lower-income urban/rural participants' attitudes, beliefs, and PAs. The study will document how to plan and implement the YEAH! curriculum in urban and rural communities, to produce effective advocacy presentations for decision makers. The study will also evaluate how youth advocacy supports policy, systems, and environmental change, and PA change among youth participants; assess training barriers to success and technical assistance needs; assess decision makers' perceptions of interactions with youth advocates; and assess policy, systems, and environmental changes resulting from the YEAH! curriculum. Measures will include presurvey and post-survey of youth and adult leaders, and semistructured interviews with decision makers.⁴²

This study will present guidance on implementing the YEAH! Program in Boys and Girls Clubs and other youth-serving organizations. YEAH! has the potential to advance policy, systems, and environmental changes, promote positive youth attitudes and beliefs, increase youth PA, and serve as a model for youth-serving organizations across the country.

Transportation, Land Use, Urban Design, and Communities Setting: Creating Safe Places to Play in the Summer: Implementing Culturally Relevant Play Streets in Lower-Income Rural Communities—Johns Hopkins University

Across the United States, Play Streets programs in under-resourced urban areas during the summer take the form of

temporary street closures to create safe spaces for play. Play Streets are considered 1 way to address health inequities because they provide places for safe play in neighborhoods without access to safe and well-maintained parks and playgrounds. Because Play Streets have been implemented primarily in urban environments, current practices could have unintentionally widened PA disparities between children in urban and rural settings. In a recent search, no peer-reviewed literature was identified that described how to plan and implement Play Streets in rural areas.

Information is lacking not only on how to implement Play Streets in rural settings but also on how to tailor this activity to the affected subgroups. Children living in rural areas are 5% to 25% more likely than those in urban areas to be overweight or obese, and rural minority children are at highest risk for obesity.^{30,43,44} In addition, existing guidelines in the gray literature on how to implement Play Streets in urban settings do not provide information about tailoring programs to specific cultural groups. Such tailoring can help increase the appeal of Play Streets by promoting cultural adaptations to stimulate interest, build community cohesion, and increase youth participation and PA through cultural games and dances.

To address these gaps, this study will examine the development, implementation, and impacts of culturally relevant Play Streets for elementary and middle school-aged children living in 4 lower-income rural communities: non-Hispanic white youth in Maryland, American Indian youth in Oklahoma, Latinos in Texas, and African Americans in North Carolina. A local agency that meets specific selection criteria at each site received a mini-grant to implement 4 or more bi-weekly or weekly Play Streets events during summer 2017. This implementation research was guided by the reach, effectiveness, adoption, implementation, and maintenance (RE-AIM) framework.⁴⁵

This study began with a systematic literature review. Key informant interviews with Play Streets organizers identified how events had been implemented in urban areas, which aided in developing relevant lessons for rural areas. As part of a multiple case study documenting implementation of Play Streets in 4 communities, with specific attention to how they were culturally tailored, focus groups, key informant interviews, and systematic document reviews were conducted for each of the 4 sites. Child PA will be assessed objectively, using the System for Observing Play and Recreation in Communities direct observation measure and pedometers; parental PA will be assessed using pedometers. Surveys of parents/guardians will assess changes in perceptions and attitudes about the impact of Play Streets on child PA. An implementation guide on developing Play Streets in rural areas, including information about liability and the permit process (concerns identified during the formative work for this study) will be developed and widely disseminated.

This study will generate important information about how to plan and implement Play Streets in rural communities, how to adapt culturally relevant Play Streets for multiple high-risk groups, and how Play Streets support children's PA. In the rural communities where Play Streets are to be implemented, community organizations will be equipped with the skills, training, and evaluation data to sustain Play Streets and support safe play and PA for children. These new skills can increase the effectiveness of community organizations to work with local policy requirements (eg, the permitting process) and can establish the necessary cross-sector partnerships to develop and maintain culturally relevant Play Streets.

Parks: Park Use and PA Among Children in Lower-Income and Racial and Ethnic Minority Communities—North Carolina State University

Public parks are key settings for promoting PA among children at highest risk for inactivity and obesity. These parks can be affected by a range of policies in their design, location, programming, management, and maintenance. Describing park use patterns among children of different race/ethnic groups, particularly in lower-income neighborhoods, can inform planning decisions both for diverse recreation needs and for public health goals, including health equity. Although parks and related environmental factors have been shown to increase children's PA, few studies include analyses for specific race/ethnic subgroups in lower-income communities.^{46,47} Evidence is limited on the key programmatic, social, and environmental features of parks that encourage PA. To benefit children from lower-income and racial and ethnic minority populations, such evidence is needed to guide park programming, design, planning, and resource allocations.

This study examines patterns of park use among children (kindergarten to fifth grade) from 3 racial and ethnic groups (African American, Latino American, and Asian American) in lower-income neighborhoods in Raleigh-Durham, NC and New York, NY. The 3 primary study aims are to identify park attributes associated with parental decisions about their children's use of neighborhood parks; compare park use among children from different subgroups; and determine the extent to which specific park characteristics, features, programs, and social contexts are associated with children's PA at parks and when deciding to go to a park.

The study will measure (1) self-reported frequency of park use, constraints to park use, parent preferences for children's PA, locations for PA, and desired park programs; (2) objectively assessed park-based PA using accelerometers, Global Positioning System monitoring, and System for Observing Play and Recreation in Communities⁴⁸; and (3) park attribute preferences. Park facilities and amenities will be measured with the Environmental Assessment of Public Recreation Spaces park audit tool.⁴⁹

Results from advisors representing the National Recreation and Park Association, National Park Service, and the Recreation Resources Service at North Carolina State University will be disseminated widely. Parks and recreation facilities represent a lasting and sustainable community resource for PA. PARC findings can inform how the health and PA benefits from these resources can be made more widely available, particularly for lower-income and race/ethnic communities.

Discussion

Despite public concern about, and substantial funding to reverse, the childhood obesity epidemic in the United States, progress has been limited and uneven across population subgroups and geographies. Disparities may have increased in recent years.¹² Further research on youth PA is needed to improve evidence-based solutions targeted to high-risk subgroups, which can be maintained through changes in practices, policies, and environments. RWJF funding for the PARC in 2016–2019 is intended to develop a prioritized research agenda, conduct interdisciplinary studies, and rapidly disseminate findings to practice and policy audiences.

The PARC RT used a systematic process to engage numerous and diverse experts in creating the research agenda reported in this paper. The agenda focuses on specific topic areas that met several criteria, including being relevant to policy and practice, potentially

leading to intervention approaches tailored to high-risk population groups, and being understudied. RT members are conducting ongoing studies addressing 4 of the prioritized research questions; all 4 research questions are summarized in the previous sections. Table 2 presents other priority questions in the research agenda that still need to be addressed. Although many ideas were developed during the RT's extensive systematic process, only a few could become PARC priorities.

An important feature of developing the research agenda was including numerous experts who know about practice and policy in various sectors of society, but are not researchers. Even when research is intended to be relevant to policy, researchers may not understand the needs of potential implementers. Thus, engaging practitioners and decision makers to help identify research questions and methods can result in different questions and priorities. Nonresearcher participants in the process can provide guidance about how to communicate research findings to practice and policy audiences. Similar processes have been recommended for the PA field, and specific efforts to engage nonresearchers throughout the research cycle were implemented in the Active Living Research program.^{50,51} Our observations of the PARC process described in this paper suggest that the research priorities reported in Table 2 can be very different when nonresearchers are involved. Thus, we believe that the present research agenda is a substantive contribution to efforts to promote evidence-based approaches to increase youth PA equitably.

The research agenda shaped the initial 4 projects PARC researchers are implementing. These projects will help identify policies, practices, and aspects of the built environment to promote safe and equitable opportunities that are developmentally appropriate for youth PA. When the 4 PARC team studies have been completed, findings will be disseminated rapidly to targeted practice and policy audiences, sometimes in collaboration with individuals and organizations that have been involved in the studies from the beginning. The findings will be packaged by study and aggregated across all PARC studies to emphasize findings by participants' ages (elementary, middle, and high school), race and ethnicity, and geography (urban/rural).

Strategic science on youth PA that focuses on improving equity of opportunities is a long-term goal, as is disseminating results to those who can put the evidence into practice. PARC responds to this need through its research and strategic dissemination. An important example of PARC's approach to research and dissemination is support for small commissioned studies to respond to the information needs of advocates working with VFHK. PARC works with VFHK and RWJF to identify which research questions should be prioritized. PARC then invites an investigator to lead the project, oversees the study, and collaborates on the dissemination of results. This is a direct application of strategic science, wherein gaps are identified through the literature review; honed by academic, practice, and policy experts; and disseminated to multiple audiences as research briefs, policy briefs, tool kits, webinars, targeted announcements or presentations to related partner organizations and intended audiences, presentations to national conferences, and peer-reviewed articles.¹⁵ It is important to note that after the research question is clarified, VFHK staff and other advocates are not involved in conducting the study or creating dissemination materials. However, VFHK staff and advocates participate in dissemination activities so that credible research findings reach appropriate audiences in a timely manner.

The research agenda is consistent with the RWJF Culture of Health framework, with interdisciplinary and multisector focus and

participation, a goal of creating healthier community environments, and a specific goal on improving equity through approaches that address the needs of high-risk groups. We hope the research emanating from the PARC RT and additional studies stimulated by the broader research agenda reported in this paper will contribute to improvements in environments, policies, and equity that lead to more active and healthier children and the communities in which they live, learn, and play.

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