1) An Innovative Approach to Developing Community Connections and Collaborations for Active Living: The Interdisciplinary Consortium on Urban Planning and Public Health

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Background:
Planning and public health are returning to their interconnected roots with a surge of research on the relationship between the built environment and health. However, building bridges between these disciplines is often difficult. One of the most substantial challenges is the development of transdisciplinary and sustainable partnerships. The Active Living Research network (including its associated community organizations and research partners) is one example of how these interrelated disciplines work together. Another example is the Interdisciplinary Consortium on Urban Planning and Public Health (ICUPPH), a novel and innovative approach for facilitating transdisciplinary conversation, research, policy, and action.

Objectives:

- To describe the Interdisciplinary Consortium on Urban Planning and Public Health (ICUPPH) and its working groups.
- To promote understanding of the activities of ICUPPH, past and future.
- To describe how ICUPPH can be a model for creating interdisciplinary coalitions that advance active living research and practice.

Methods:
The Interdisciplinary Consortium on Urban Planning and Public Health (ICUPPH) was founded in 2006 by students at the Harvard School of Public Health, the Harvard Graduate School of Design, and the School of Architecture and Planning at MIT who shared a common interest in the intersection of planning and public health. It was conceived as a way to provide resources, contacts, and expertise to Boston area researchers, non-profit organizations, and government agencies working to improve health outcomes through the built environment. As the founding students graduated, they remained active and the process of building networks began. Networks are created through the activities of the consortium (building relationships with invited speakers, community groups, and attendees), and through the use of new social media such as Link'dIn and Facebook. Currently, ICUPPH has over 200 members and three working groups: education, outreach, and research.

Results:
The Interdisciplinary Consortium on Urban Planning and Public Health (ICUPPH) has planned and implemented activities in education, outreach, and research. Initially, the focus of education activities was to increase awareness of the connection between planning and health among researchers, practitioners, and students of these and related fields. Examples of such activities include a forum regarding LEED standards for neighborhood development, a seminar series focused on neighborhoods and the health of children, including reducing disparities in opportunities for physical activity, and a discussion among planning and public health professionals and students to create recommendations for a housing desegregation program that considers health in Baltimore, MD. While the consortium continues activities to facilitate interdisciplinary knowledge sharing, research and practice, it has also initiated activities in the area of community outreach. A comprehensive community survey has recently been sent to over 200 professionals in greater Boston who work in a wide range of areas, from faith-based organizations, to community development corporations and

local government officials. The purpose of the survey is to gain an understanding of how these organizations view the connection between planning and health, and will be used to inform future activities. The results of the survey are pending and will be presented at the conference. While ICUPPH is not currently engaged in research activities, it is establishing an annotated resource with regard to the current literature on children, physical activity, and the built environment. The purpose of this resource is to guide local organizations in their interventions with children and physical activity and inform future areas of research.

At the present time, ICUPPH membership represents a variety of disciplines including urban and city planning, urban design, food and nutrition policy, public health, landscape architecture, environmental policy, healthy communities, and transportation. In a short time, the consortium has grown tremendously from casual meetings among a handful of interested students to a recognized organization that brings experts, practitioners, and researchers together around issues of active living, healthy food environments, and other topics important to the greater Boston area.

Conclusions:
The Interdisciplinary Consortium on Urban Planning and Public Health (ICUPPH) provides an example of a grassroots, transdisciplinary organization, which is not bound by traditional academic and institutional boundaries. ICUPPH has brought together many professionals, students, and researchers in the area of urban planning and public health in order to advance ideas, share knowledge, and consider strategies for community change. ICUPPH's model is appropriate for replication elsewhere in the country and may be effective at bringing groups together in other communities as well.

2) Walking Behavior Differences by Housing Setting among Community-Dwelling Seniors: Social and Perceived Environmental Influences

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Background:
Few studies have examined walking behaviors of seniors living in senior housing settings (i.e., assisted-living, retirement) compared with seniors living in other community-dwelling settings (i.e., multi-family mixed generation, single-family), despite what is known about the influence of the built environment on mobility, autonomy, and physical and mental health. Although seniors living in more walkable urban neighborhoods are likely to report more walking in general, we hypothesized that after controlling for this association and other demographic and health factors, those living in senior housing would report more walking for transport and leisure, but not brisk walking for exercise. Furthermore, we expected these differences would be due to more positive perceptions of the social and built environments.

Objectives:
The objectives of this study were to: (1) examine the association between housing setting (senior housing compared to single- and multi-family housing) and walking behaviors after accounting for neighborhood clustering and neighborhood-level income and walkability; and (2) to explore whether any of the associations between housing setting and walking could be explained by social environmental (social support for physical activity, neighborhood social cohesion), or perceived built environmental factors after controlling for demographic (age, gender, race/ethnicity, educational status, marital status) and health factors (BMI, functional disability).

Methods:
The Senior Neighborhood Quality of Life Study is an observational study of community-dwelling, ambulatory seniors in metropolitan Seattle and Baltimore selected from and stratified by objectively-measured neighborhood-level income and walkability factors. Participants completed a survey packet during an initial and again six months later.

Demographic information and current housing setting were collected via self-report. The following standardized measures were also collected: Late-Life Function and Disability Inventory, Social Support for Physical Activity, Neighborhood Social Cohesion, and Neighborhood Environment Walkability Scales (NEWS). Walking was assessed via the self-reported CHAMPS physical activity questionnaire during both study assessment points. Walking for leisure, walking for transport, and walking briskly were each assessed using single items from the CHAMPS.

The associations between housing setting and the three walking behaviors (leisure, transport, and brisk walking) were assessed using three-level mixed effects regression models accounting for neighborhood clustering and the repeated effects of examining walking behavior at both assessment points. The initial models compared walking behavior by housing setting after accounting for neighborhood clustering and neighborhood-level income and walkability. Subsequent models were developed that included demographic, health, social environmental (social support, neighborhood social cohesion), and perceived environmental (NEWS) factors. The associations between walking behaviors and housing setting were inspected in these

models to ascertain whether inclusion of the additional factors was able to explain initial differences observed by housing setting.

Results:
Participants (N=877) were ages 66 years and older (M=75.33, SD=6.82) with 56% women, 71% white, and 59% overweight/obese. Completion rates were >85% for survey data at both assessments.

Senior housing residents (M=145.49±11.48 min•wk-1) reported significantly more minutes of walking for leisure compared with single-family (M=93.19±4.92 min•wk-1, p<.001) and multi-family (M=101.18±7.11 min•wk-1, p<.001) residents in a typical week. Social support for physical activity (p<.001), reported land use diversity (p=.03), and pedestrian safety (p=.01) positively predicted walking for leisure, whereas neighborhood social cohesion (p=.01) negatively predicted walking for leisure. Initial housing setting differences persisted after entry of these additional variables, such that senior housing residents had significantly more minutes of leisure walking in a typical week compared with single- and multi-family residents.

Senior housing residents (M=62.02±9.01 min•wk-1) also reported significantly more minutes of walking for transport in a typical week compared with single-family residents (M=37.39±3.76 min•wk-1, p=.01), but equal amounts to multi-family housing residents (M=51.73±5.21 min•wk-1, p=.27). Social support for physical activity (p=.01), reported residential density (p<.001), and accessibility to mixed land use (p<.001) positively predicted walking for transport, whereas poorer perceptions of traffic safety (p=.01) predicted less walking for transport. Initial housing setting differences were fully explained after entry of these additional variables.

There were no significant differences observed in brisk walking between senior housing (M=44.18±10.10 min•wk-1), single-family (M=54.00±4.26 min•wk-1), and multi-family (M=49.88±6.11 min•wk-1) residents. However, social support for physical activity (p=.001) and land use diversity (p=.03) positively predicted brisk walking.

Conclusions:
Our hypotheses were partially confirmed. Senior housing residents reported higher levels of transport and leisure walking compared with multi- and single-family residents; however, no differences were observed for brisk walking. Social support for physical activity and perceived attributes of the built environment were able to account for higher levels of transport-related walking among senior housing residents. While social support and perceived built environment attributes influenced walking for leisure, they did not fully account for the higher levels of leisure walking among senior housing. Collectively, the results suggest different profiles of walking behavior among seniors living in different housing settings, both in terms of the type of walking likely to be undertaken as well as the perceived social and built environmental factors that may influence participation.

Support:
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3) Relationships between Traditional and Novel Measures of Neighborhood Walkability: The Use of Walk Score™ in Public Health

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Background:
Recent research has demonstrated correlations between physical activity and both subjective and objective measures of walkability, including presence of walkable destinations, street connectivity, residential density and access to public transit. Subjective measures are limited by potential error while objective measures of walkability have relied on limited access to Geographic Information System (GIS) data and time consuming tasks such as conducting neighborhood audits. Walk Score™ is a novel and publicly available website traditionally used for real estate purposes that utilizes the Google AJAX Search API to quickly identify amenities near entered addresses along with a geographically based algorithm to calculate a walkability score on a continuous scale. The Walk Score™ algorithm awards points based on the distance to the closest amenity in each of 13 different amenity categories (e.g., grocery stores, coffee shops, restaurants, bars, movie theaters, schools, parks, libraries, book stores, fitness centers, drug stores, hardware stores, clothing/music stores). Each category is weighted equally and the points are summed and normalized to yield a score from 0-100. Walk Score is limited, however, in that it is based entirely on the presence of nearby walkable destinations and does not account for other traditional components of walkability including street connectivity, access to public transit and/or residential density. To our knowledge, no previous studies have assessed the relationship between Walk Score™ and traditional subjective and/or objective measures of neighborhood walkability.

Objectives:
To examine the relationship between Walk Score™ and traditional subjective and objective measures of neighborhood walkability among 80 sedentary, Latina women residing within an urban setting.

Methods:
A Walk Score™ was calculated for each participant by entering the provided address. Participant addresses were address matched and geocoded using ArcGIS 9.3. A half-mile buffer was created around each address based on previous research indicating a half-mile to be a reasonable walkable distance. GIS data were accessed via the Rhode Island Geographic Information System (RIGIS) database. Street connectivity was based on the 2005 U.S. Census Bureau TIGER/Line street file. Measures of street connectivity (e.g., number street intersections within half-mile buffer, number streets within half-mile buffer, sum of length of streets within half-mile buffer) were calculated using the network analyst function of ArcGIS. Residential density was based on the 2000 U.S. Census Summary File block data and the total number of residents residing within a half-mile buffer was calculated for each participant. Public transit data was collected from the 2009 Rhode Island Public Transit Authority file and sum of total bus stops within a half-mile buffer was calculated for each participant. Pairwise Pearson correlations were run between Walk Score™ and both subjective (e.g., survey) and objective (e.g., GIS) measures of walkability. Subjective measures were assessed using a previously validated questionnaire assessing perceptions of neighborhood characteristics (sidewalks, trails, heavy traffic, streetlights, unattended dogs, and safety from crime) and general access to places for physical activity.

Results:
Significant positive correlations were found between Walk Score and the sum of street intersections within a half-mile buffer (0.45; $p<0.001$), sum of streets within a half-mile buffer (0.52; $p<0.001$), sum of total population within a half-mile buffer (0.38; $p<0.001$), average population density within a half-mile (0.50; $p<0.001$), and sum of public transit bus stops within a half-mile buffer (0.53; $p<0.001$). No correlations were observed between the summed scores of the subjective measures of walkability (e.g., sum of nearby facilities and sum of neighborhood walkability) and either Walk Score™ or any of the GIS derived measures of walkability.

Conclusions:
Walk Score™ is positively associated with several objective measures of neighborhood walkability and may serve as a useful tool in estimating neighborhood walkability on a large scale. Walk Score™ did not correlate with any subjective measures of walkability in this sample, indicating a possible disconnect between the actual and perceived walkable facilities in this sedentary population. Collectively, these data may be useful for the development of future environmentally tailored physical activity promotion programs that attempt to educate participants about location and access to nearby walkable destinations and physical activity facilities.

Support:
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4) Review of Environment and Policy Interventions for Childhood Obesity Prevention

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Background:
Insufficient consensus has been reached on research- and practice-based information and resources to inform evidence-based intervention planning and decision-making at the local, state and national levels. Gaps in evidence include, but are not limited to, policy and practice recommendations for environment and policy intervention strategies with varying levels of impact; methods to systematically identify, collect and document intervention strategies; practical considerations for implementing and evaluating environment and policy interventions; and translation and dissemination of environment and policy intervention strategies to policy-makers and practitioners. The Review of Environment and Policy Interventions for Childhood Obesity Prevention project, funded by the Robert Wood Johnson Foundation, addresses these evidence and methodological gaps through the identification and review of physical activity, nutrition and screen time environment and policy intervention strategies for childhood obesity prevention across four levels of evidence: top-tier, effective, promising and emerging. The purpose of this project is to bridge research/evaluation and policy/practice efforts associated with environment and policy intervention strategies for childhood obesity prevention, and to accelerate the translation of replicable, evidence-based environment and policy interventions that will lead to the reduction of childhood obesity, especially in lower income and racial/ethnic populations. To achieve these goals, the project has developed a systematic process for identifying, collecting, reviewing and summarizing research- and practice-based evidence to support existing research, policy, practice and evaluation efforts to address childhood obesity prevention. This presentation will provide a sample of results from our review of effective evidence for the following intervention strategies related to active living: transportation and travel policies and access to safe and inviting places to be active in the community.

Objectives:
There are five primary objectives for this project: 1) to refine a systematic annual process for resource collection, review and synthesis of top-tier, effective, promising and emerging environment and policy interventions; 2) to develop intervention strategy summaries to disseminate evidence ; 3) to identify strategic partnerships and systematic methods to collect evidence resources (i.e., “inputs”); 4) to develop a plan for sharing intervention strategy summaries to various research, policy and practice audiences (i.e., “outputs”); and 5) to develop a plan for ongoing review and synthesis of environment and policy strategies.

Methods:
The project team identifies effective interventions by searching PubMed, Ovid and other peer-reviewed literature databases and resources for interventions in nutrition and physical activity, using keywords for special populations and settings. Reference lists from research summaries and peer-reviewed articles found applicable to the project are also examined for relevant resources, and international literature are included in the review. Inclusion criteria for resources include: 1) fits project definition of environment and/or policy intervention; 2) addresses outcomes including reducing obesity, improving nutrition, increasing physical activity, and/or reducing screen time; 3) impacts children (aged 3-18), families, or the communities in which they live, learn, work and play; and 4) has the potential to impact lower income and racial/ethnic populations. An abstraction guide was developed to review effective, promising and emerging interventions. The abstraction guide draws upon research- and practice-based evidence reviews and adapted review materials from four main systematic reviews: CDC Community Guide, Guide for Useful Interventions for Activity (GUIA) Project, Center TRT and the CDC-RWJF Early Assessment Initiative. The abstraction guide questions are specific and straightforward for review by research assistants. Abstraction is performed by two reviewers per intervention to ensure reliability, and discrepancies are discussed by the review team to develop consensus.

Based on the results of the search and abstraction processes, the project team creates a summary and synthesis of findings for each intervention strategy within the four levels of evidence that includes a strategy overview, evidence tables for each intervention and summary of evidence gaps for research/evaluation and policy/practice.

Results:
Intervention Strategy Summaries from the review of interventions addressing transportation and travel policies for physical activity and access to safe and inviting places to be active in the community will be completed by December 31, 2009. These intervention strategy summaries will provide a summary and synthesis of findings to serve as the basis for translation and dissemination efforts to guide existing research, evaluation and intervention efforts.

Conclusions:
This project builds on a broad evidence review to systematically bridge research- and practice-based evidence for physical activity, nutrition and screen time environment and policy interventions and to accelerate the dissemination of those with the greatest potential for population impact, especially in lower income and racial/ethnic populations. The project builds on other related efforts to minimize duplication of efforts happening at national, state and local levels promoting the use of effective intervention strategies and identifying research and evaluation gaps.

Support:
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5) The Development of ELEPhANTS, the Early Learning Environments Physical Activity and Nutrition Telephone Survey: An Example Using Mixed-Methods and Community-Engagement in Designing Research

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Background:
Over 12 million US children are in some form of child care. Daily physical activity and a balanced dietary intake are essential for proper childhood growth and development. Yet there are no published research survey instruments to measure the nutrition or physical activity environment of child-care centers. The best known and validated questionnaire, the Nutrition and Physical Activity Self-Assessment for Child-Care (NAP SACC, Ammerman et al) was designed as an intervention tool rather than a research instrument, and like all surveys in which respondents can choose among a set of given responses, it is subject to social-desirability bias.

Objectives:
Our objectives were to: 1) develop a telephone survey instrument to measure child-care center nutrition and physical activity environment, and 2) determine the feasibility of implementing the instrument. We engaged the child-care community to insure the survey items were both understandable and relevant to the study population. We incorporated an open-ended question format in which the respondent volunteered responses without seeing answer options in order to reduce social-desirability bias.

Methods:
We conducted 9 focus groups of 49 child-care providers (55% black) from 34 centers (including inner-city, suburban, Head Start and Montessori) in Cincinnati, OH. Questions focused on facilitators and barriers to 3-6 year olds' activity in child-care. The principal investigator (KC) attended all 9 focus groups, and thus was able to refine iteratively the focus group question guide. The topic guide for the final focus group became the initial draft of the questions for the telephone survey instrument. Response options for novel questions were derived from commonly mentioned themes in the focus groups*. In this way, the community of child-care providers informed the research questions.*

Prior to field-testing, the final telephone survey instrument was tested for face validity through cognitive pre-testing with 13 child-care providers. The instrument was also reviewed by a panel of experts from *diverse fields* including: early education, child-care playground equipment sales, landscape architecture, physical activity and parks assessment, nutritional epidemiology, and scale development. The final paper-and-pen instrument was administered to child-care directors over the telephone by a trained survey interviewer. It consisted of 65 questions (50% open-ended/volunteer response), including 27 questions developed from the focus groups, 27 from pre-existing instruments, and 11 based on literature/expert review. Examples of question topics that were derived from focus group results include: playgrounds, their surfaces, alternatives to playgrounds (for centers without one), special needs access, and aspects the director would like to improve; weather policies for outdoor play; policies about clothing that may restrict physical activity (e.g., flip flops or no coat in winter); and availability of indoor play-space on days with inclement weather.

Because the open-ended style format requires the interviewer to choose among pre-coded responses, all interviews were audio-taped. The interviewer noted any additional comments the respondent made and discussed any issues or questions with the PI following survey administration. Coding interpretations were resolved through consensus after reviewing the written comments and audio transcripts as necessary.

A list of all 196 licensed child-care centers in Hamilton County, Ohio, was obtained from the local child-care resource and referral agency in June 2008. A trained interviewer attempted to contact all 196 center directors up to 8-10 times, at different times of the day. A convenience sample of 31 child care centers agreed to do the interview again in 2-4 weeks, in order to assess test-retest reliability of the instrument.

Results:
Only 13 centers refused to participate in field-testing and 11 centers were ineligible, for a response rate of 87.6% (162 of 185 eligible centers). Center characteristics of respondents varied widely: 33% were at least partially-affiliated with Head Start, 58% participated in the reduced-fee lunch program (CACFP). The reported center's primary race (race of $\geq$50% of enrolled children) was white for 60 (42%) centers, black for 77 (54%) centers, mixed race for 5 (3.5% of centers), and no primary race for 20 (12%) of centers.

Conclusions:
Using principles of qualitative and community-based participatory research, we were able to develop and feasibly administer a telephone survey instrument measuring child-care center nutrition and physical activity environment to 87% of all licensed centers in one urban county, with substantial participation from low-income and racially-diverse centers. Survey questions were relevant and meaningful to the study population, as half of the questions were derived from child-care providers and non-traditional experts such as a landscape architect and a playground equipment salesperson. Next steps are to analyze baseline and test-retest reliability and to assess instrument criterion validity (against the gold-standard of researchers' direct observations) in a field of 30 child-care centers.

Support:
This work was supported in part by a grant under The Robert Wood Johnson Foundation Physician Faculty Scholars Program, and a Career Development Award (K23HL0880531) from the National Heart Lung, & Blood Institute at the National Institutes of Health.

6) The Medical Home's Backyard- Using Local Partners to Attach Children to Nature and Increase Physical Activity

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Background:
The primary target population of this exploratory study is preadolescent and adolescent students residing a rural/transitional Appalachian community. West Virginia has the 2nd highest rate of childhood obesity in the nation and ranks significantly higher than the national average in the prevalence of sedentary lifestyle and preventable chronic diseases. West Virginia is predominantly rural and has one of the highest poverty rates in the nation. The preadolescent and early adolescent years are critical in shaping lifelong weight and lifestyle choices.

Objectives:
To evaluate the impact of school policy changes on student and school personnel health behaviors. Primary aims: 1) to develop population specific strategies to overcome barriers to physical activity 2) promote positive intergenerational social interactions; and, 3) to engage larger community in ongoing physical activity in natural settings. Survey data was used to measure: 1) attitudes about physical activity 2) levels of out-of-school activity 3) intent to engage in outdoor physical activity post intervention.

Methods:
Tiger on the Trail began as a voluntary collaborative between Dr. Mark Cucuzzella of West Virginia University and Harpers Ferry National Historical Park to promote outdoor physical activity. The initiative resulted in a *change in school policy* at a local middle-school to partner with the National Park Service and pilot a novel health/physical education program during the 2007-2008 school year which grew in the 2008-2009 school year to include 3 other schools. In contrast to traditional health/physical education, *Tiger on the Trail* promotes non-competitive physical activity using “nature as the classroom.” Program participants learned about health, fitness, nature and local history while hiking to and through local National Parks during school hours. *Play* is the process. Reattaching children to nature and all of its mental and physical benefits is the product. *Tiger on the Trail* has evolved from local grassroots efforts and now involves the public schools, National Parks, the community medical clinic, and other volunteers in a powerful collaborative which understands we must take extreme action to reconnect children with nature.

Results:
In 2 years approximately 1700 students, teachers and family members participated in the program and hiked over 6000 miles. Survey findings from post-hike questionnaires suggest that the program positively impacted participants' attitudes about physical activity and decreased anxiety about physical activity in natural settings. Local Principals changed school policy in favor of innovative approaches to health and physical education prompted by passage of WV 2186 (new WV Department of Education *requirements* for physical education) based on the popularity of the initial program.

200 students who participated in at least one hike were surveyed after the 2008-9 school year. The questions and results are below:

1) I enjoyed my hiking experience: 68 - Strongly agree, 101 - Agree, 26 - Undecided, 5 - Disagree, 1 - Strongly disagree
2) I learned something of value on my hike: 39 - Strongly agree, 87 - Agree, 46 - Undecided, 20 - Disagree, 7 - Strongly disagree
3) After this hike, I am more likely to exercise outdoors: 58 - Strongly Agree, 65 - Agree, 47 - Undecided, 24 - Disagree, 4 - Strongly disagree
4) After participation with *Tiger on the Trail*, I am more likely to encourage my friends or family to plan an outdoor activity: 45 - Strongly agree, 73 - Agree, 49 - Undecided, 22 -Disagree, 9 - Strongly disagree
5) I felt happier after hiking: 50 - Strongly agree, 80 - Agree, 49 - Undecided, 18 - Disagree, 1 - Strongly disagree
6) I am able to pay attention to my school work after I exercise outside: 40 - Strongly agree, 59 - Agree, 49 - Undecided, 38 - Disagree, 10 - Strongly disagree

Conclusions:
Tiger on the Trail is a pilot program of a school policy change on student health behaviors, specifically in relation to outdoor physical activity.

By reaching *almost all students* in a rural middle school we:

1) Developed population specific strategies to overcome barriers to physical activity
2) Promoted positive social interaction with students and community outdoor leaders
3) Engaged larger community in physical activity in natural settings
4) Survey data reflects improved likelihood to engage in outdoor activity. This will need future study.
5) Challenges are sustainability and keeping student interest. Survey comments reflected desire for longer hikes to different places.
6) Further study would measure quantitative amounts of post hike physical activity to validate true behavior change

Support:

1) Claude Worthington Benedum Foundation- 25,000 dollar community health grant for Dr. Cucuzzella's effort
2) National Park Service- $10,000 dollar grant for transportation and supplies for hikes. Over 200 hours of in-kind support for 2007-8 and 2008-9 school years to lead hikes.
3) Appalachian Trail Conservancy- Over 50 hours of in-kind support for 2007-8 and 2008-9 school years to lead hikes.
4) Over 20 local volunteer hike leaders

7) Use of Health Impact Assessment to Promote Physical Activity Benefits of Transportation Projects and Policies

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Background:
Transportation planners often pay little attention to the impacts of transportation on physical activity, pedestrian mobility, and obesity in their decisions. Transportation plans and policies that increase the availability of safe and accessible pedestrian, bicycle, and public transit options promote health. Health impact assessment (HIA) methods can be used to facilitate communication between public health officials and transportation planners to consider the health consequences of transportation decisions.

Objectives:

1) To identify current uses and benefits of HIA methods in transportation projects and policies.
2) To encourage further use of HIAs to increase awareness of transportation planners about the health implications of their decisions.
3) To highlight the need for public health professionals to become more involved in transportation planning activities.

Methods:
Transportation-related HIAs were identified from a 2008 review of US-based HIAs, an updated literature search, and professional networking. Projects and policies were included if a local, state, or federal transportation agency was substantially involved in the planning and design of the project or policy, or could have had such involvement (e.g., a bicycle trail built by a parks department). Transportation-related HIAs conducted outside of the U.S. were excluded. Details about the completed HIAs were obtained from websites and communication with the primary investigators. Key characteristics of each HIA report were abstracted, including year, location, type of project or policy, and information about who conducted and funded the HIA, and about the methods, scoping, assessment, recommendations, dissemination, and impacts of the HIA.

Results:
The 15 projects and policies for which HIAs have been completed in the U.S. include 3 road and bridge redevelopments, 3 corridor redevelopments, 3 trail and greenway projects, 3 transportation related policies, 2 transit-related projects, and one community transportation plan. Health issues examined in these HIAs included physical activity, air and water quality, injury, noise, social capital, mental health, and social equity. Some HIAs were conducted in conjunction with or as an adjunct to a required Environmental Impact Assessment (EIA) process. The use of quantitative and qualitative methods varied among HIAs. Most HIAs presented recommendations for policy or project changes to improve health.

Some HIAs directly affected decisions, such as pedestrian and bicycle improvements being added to a corridor redevelopment plan and a public health professional being added to a transit project advisory committee. Other HIAs had relatively little impact, because of low interest by the decision maker in the HIA process or because the decision was made before completion of the HIA. Most HIAs resulted in increased awareness of health issues among decision-makers.

Conclusions:
Health impacts such as physical activity, mental health, social capital, and environmental justice receive little attention in most transportation planning decisions, and thus opportunities to improve the health of the public are missed. HIA is an emerging tool that identifies potential health consequences of proposed transportation projects and policies and offers recommendations to encourage positive and minimize adverse health impacts of such projects and policies.

HIAs for transportation related projects and policies can be conducted in conjunction with the EIA process, under other laws or regulations, or on a voluntary basis. Most transportation-related HIAs to date have been voluntary, led by academics, health departments, transportation planners, or advocacy groups. While this approach brings high enthusiasm from the investigators, good opportunities for community involvement, and a low likelihood of litigation, voluntary HIAs are unlikely to be conducted in many projects and policies for which they would be useful, due to a lack of resources or technical capacity.

Although HIAs are sometimes criticized for lacking quantitative rigor, public health practitioners do not need precise usage predictions before advocating for the health and safety benefits of pedestrian and bicycle facilities and of public transit systems, and against road expansions that encourage single occupancy motor vehicle use. Many or most recommendations from HIAs now based on qualitative information would be unchanged if quantitative data were available. Several study limitations should be considered. Some transportation-related HIAs conducted in the U.S. may have been missed because they are not publicly available, are not posted on the web, or are not identifiable as HIAs. In addition, no attempt was made to review transportation-related EIAs to determine which ones included substantial information about health impacts.

In summary, recommendations from HIAs are more likely to receive consideration by decision-makers if the HIA is timely and if the decision-makers accept the concept that health impacts should be a part of their decision process. More work is needed to identify best practices for conducting HIAs, to build capacity to conduct HIAs, and to increase funding sources for communities that want to conduct HIAs. HIA is a tool that can be used to improve communication between transportation and public health officials and thereby encourage transportation projects and policies that promote physical activity.

8) Connecting Parks, Health, and Pedestrian Safety: Improving Pedestrian and Bicyclist Access to Harlem River Park

Julia Day, BA

Transportation Alternatives

Background:
More and more cities are creating more open space as a way to address public health issues such as asthma and obesity prevention. The new construction of the Harlem River Park along the Harlem River waterfront is the result of PlaNYC's mandate to create open space within 10 minutes of every New Yorker. Yet Harlem River Park also illustrates that building the park is only part of the puzzle of increasing access to open space.

Many people who live in the residential complexes overlooking Harlem River Park do not know how to enter it. The access ways are small and unidentifiable, some just five feet wide and are between or along roads with heavy vehicular traffic leading on or off Harlem River Drive.
Accessing Harlem River Park is a public health issue. East and Central Harlem suffer huge public health disparities. The District Health Public Office of the New York City Department of Health and Mental Hygiene identified East and Central Harlem, Manhattan Community Districts 10 and 11, as high-need areas in which to address public health issues. In East and Central Harlem 1 in 3 adults is considered obese, and 25% of adults do not get any physical activity. A 2004 report from the NYC Department of Health and Mental Hygiene found parks contribute to neighborhood health. As one of the few open spaces in East and Central Harlem, Harlem River Park could greatly contribute to improving access to physical activity and overall community public health.

Objectives:
The objectives were to:

- Understand obstacles to accessing the park.
- Improve pedestrian and bicyclist access to Harlem River Park.
- Work with the city to adopt policy changes that plan for safe pedestrian and bicyclist access to parks as part of open space creation.

Methods:
We surveyed residents in the neighborhood, including residents in adjacent housing complexes to the park and throughout the immediate neighborhood. The survey asked approximately 10 questions that ranged from: how people travel to the park, what activities they engage in while at the park, such as walking or biking, and what could be changed at the intersections adjacent to the park to make it easier to walk or bike to. We also conducted site visits with residents and walking tours to better understand first hand the problems with accessing the park. We used survey results and input from walking tours and site visits to develop street design recommendations.

Results:
The survey helped to understand barriers to access to the park and allowed residents to propose ideas for how to make the park more accessible to community members. Findings showed that Harlem River Park can positively contribute to the community's public health. A majority of visitors walk to the park (65%) and 38% use it to exercise or engage in physical activities.

Harlem River Park has the potential to benefit the 224,852 residents of Central and East Harlem (Census 2000). A large number -61,973 and 25,732 respectively- are under the age of 18 or over the age of 65, and require an even higher standard of pedestrian safety in order to access the park safely. Of these residents, 9,784 live in the census tracts directly adjacent to the intersections that lead into the park.

Based on the survey results, T.A. wrote a report, “Connecting Parks, Health, and Pedestrian Safety: Improving Pedestrian and Cyclist Access to Harlem River Park” and made formal recommendations for design improvements to the NYC Departments of Transportation (DOT). The NYC DOT responded by initiating a traffic engineering and safety study of the intersections where people access the park. The agency has committed to implementing pedestrian and bicyclist improvements to accessing the park by 2010.

Conclusions:
New open space can be an incredible asset to communities that suffer health disparities but residents must be ensured safe passage to benefit from them. In a neighborhood where 25% of people do not get daily physical activity, the Harlem River Park can improve public health by providing a safe, accessible space to engage in exercise.

Support:
This work was made possible through a grant from the New York City Food and Fitness Partnership, a program of the W.K. Kellogg Foundation. Transportation Alternatives also received financial support from the Laura B. Vogler Foundation, Inc. to create the Harlem River Park Walk Access and Usage Survey. The Harlem River Park Task Force has been a critical and active community ally and leader.

9) Measuring the Social and Physical Contexts of Children's Physical Activity Using Ecological Momentary Assessment

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Background:
Studies of the built environment and physical activity largely measure the presence, availability of, and access and distance to resources (e.g., parks, sidewalks, recreation centers). Unfortunately, this research approach provides limited information about the extent to which children actually visit or use these environmental features for physical activity. Lack of space for play, lack of awareness of opportunities, lack of time, safety concerns, and other barriers may prevent children from using facilities that are available. Studies have employed in-person observational techniques to measure children's activity in single settings, such as a school playground or during physical education classes. Yet, no known research has examined children's physical activity across the full range of settings or contexts in which they take place throughout the day. These limitations may be partially addressed by real-time data capture methods such as Ecological Momentary Assessment (EMA), which measure where and with whom children's physical activity occurs.

Objectives:
This study used EMA with mobile phones to describe the social and physical contexts of physical activity among low-to-middle income, ethnically-diverse children in Southern California.

Methods:
A sample of 49 children (ages 10-14 years) (M = 11.7 years, SD = 1.2 years) (60% female, 39% Hispanic/Latino, 15% receiving free or reduced lunch) participated in four consecutive days (Fri. at 4pm to Mon. at 8:30pm) of EMA during discretionary time. Each EMA item sequence was prompted at a random time within one of 20 preprogrammed two hour intervals across the four days. No prompting occurred during school hours on Monday. Using an HTC Shadow mobile phone, children reported their primary activity (e.g. active play/sports/exercise, watching TV/movies), social company (e.g., family, friends, alone), physical location (e.g., home, outdoors, school), and a number of other physical contextual features (e.g., perceived safety, traffic, vegetation, distance from home). Only children with at least one report of active play/sports/exercise were included in the current analyses (N = 40). Multilevel multinomial logistic regression analyses compared the proportion of bouts occurring in each context by age and gender controlling for socioeconomic status (% receiving free or reduced price school lunch), and race/ethnicity, weekend/weekday, and time of day.

Results:
On average per child, active play/sports/exercise was reported as the primary activity in 22% of EMA prompts. The largest proportion of children's active play/sports/exercise occurred with multiple categories of people (e.g., family and friends) (47%), followed by bouts performed with family members only (29%), alone (19%), and with friends only (5%). The most commonly reported physical context for children's active play/sports/exercise was outdoors (43%), followed by at home (31%), someone else's house (7%), at a gym/recreation center (4%), and other locations (15%). When outdoors, children's active play/sports/exercise was distributed across the following settings: park or trail (28.6%), sidewalk (14%), road (7%), parking lot (2%) and other outdoor locations (48%). When at a park, 53% of active play/sports/exercise occurred on a sports field, 12% on a basketball or tennis court, 6% at a beach, 6% at a picnic area, and 24% at other park areas. Sixty percent of outdoor active play/sports/exercise occurred in an area with a lot of trees and plants. About 62% of outdoor active play/sports/exercise was reported in a place where there was no traffic, and only

6% occurred in a place with a lot of traffic. About 82% of outdoor active play/sports/exercise was reported in a location where children felt very safe, and only 2% where they felt unsafe. Approximately 45% of active play/sports/exercise took place more than a few blocks from home, and 24% occurred a few blocks from home. Girls were more likely to engage in physical activity at home and less likely to be physically active outdoors than boys. Children ages 13-14 years were more likely to participate in physical activity in outdoor locations, alone, and with friends; and less likely to be active at home than children ages 10-12 years.

Conclusions:
The current study used a novel research methodology to identify the types of settings and contexts that low-to-middle income, ethnically-diverse children use for physical activity. For this population, physical activity frequently occurred at a park or trail, sports field, and at home, whereas activity rarely occurred at a gym/recreation center, sidewalk, road, or someone else's house. Almost half of children's activity took place more than a few blocks from home. Family members (including parents and siblings) were the most common social context for physical activity. Physical activity environments differed between girls and boys, and between younger and older children. These preliminary results suggest that children may prefer or have greater opportunities to be physically active in some contexts but not others. Findings from this study support the viability of using EMA methodology in larger scale research projects that could form the basis for context-specific interventions in this age group.

Support:
Rapid-Response grant through the Robert Wood Johnson Foundation's Active Living Research Program, # 65837 (Dunton, PI) and National Cancer Institute #R01-CA-123243 (Pentz, PI).

10) Does Urban Form Matter in Solo versus Joint Activity Engagement?

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Background:
Researchers have long argued that the growing impoverishment of American lifestyle and the increasingly sedentary activity patterns among US population are partially attributed to sprawl. During the long-running debate, a range of design alternatives (e.g., smart growth and new urbanism) have emerged to counter urban sprawl and encourage active, diversified lifestyles. However, whether the alternative design concepts can achieve their presumed objectives requires rigorous empirical investigations into the impact of urban form on joint activity engagement decisions made by household members. Review of the literature indicates a paucity of research on the subject.

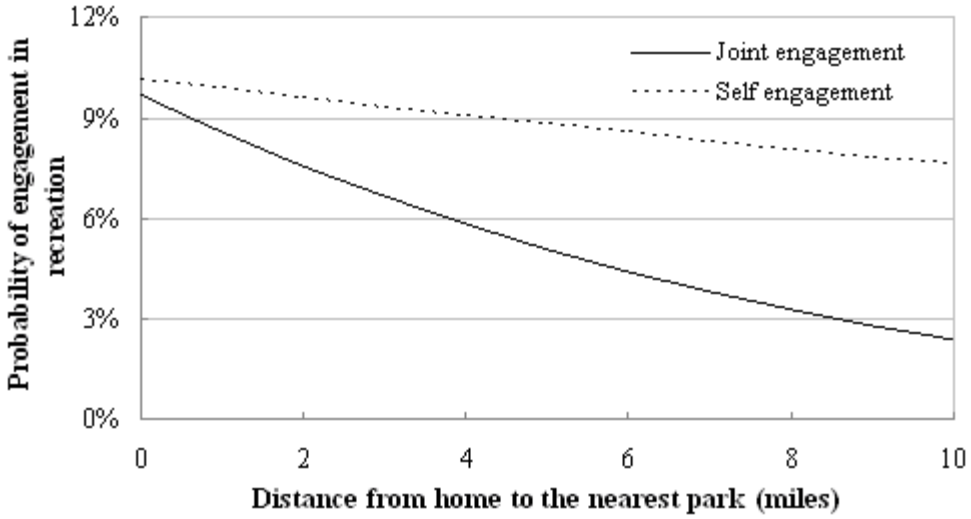
Objectives:
This paper presents an attempt to fill the knowledge gap by examining how individual solo engagement and household joint engagement in everyday non-work activities vary with urban form factors at the residential location. The focus on non-work activities is partially due to people's discretion over non-work activities. In addition, focusing on non-work activity engagement allows exploring an important but often overlooked theme in the environment-behavior literature--joint activity engagement among household members. Allocation of daily leisure time, compared to hours at work, is more deeply marked by negotiation within the household. Exploring spatial variation in individual versus joint engagement in non-work activities helps to understand the critical role that intra-household dynamics play in shaping the urban form and activity engagement link.

Methods:
Using data from the 2006 Greater Triangle Travel Survey in North Carolina, individual activity engagement is innovatively measured using two indicators: total time spent alone and total time jointly spent with household members on a specific non-work activity type. The impact of the built environment on non-work activity engagement is then estimated using Heckman sample selection models along with a seemingly unrelated estimation system.

Results:
We find that residents living closer to parks and department stores on average are more likely to participate in out-of-home recreation and shopping activities. A comparison of coefficients in solo versus joint engagement models shows that park accessibility is much more important to household joint participation than to solo participation in recreational activities. For a resident who lives next to a green park, she/he has an 11% chance of participating alone in recreational activities and a 10% chance of participating with her/his partner and/or child in recreational activities. If the resident moves to a location where the nearest parks are 10 miles away, the likelihood of joint participation in recreational activities drops from 10% to 2% and her/his likelihood of solo participation drops from 11% to 8%.

Conclusions:
This research uniquely captures the joint nature of activity engagement decisions and allows an in-depth investigation into how urban form may influence independent and joint activity engagement differently. Most importantly, joint participation among household members in out-of-home recreation is found to have higher sensitivity to park accessibility at residences than solo participation, indicating that family and community well-being may be improved through better access to green parks. These interpretations contribute to the ongoing debate over compact vs. "green" cities. The growing pressures of environmentalism and the emerging concept of sustainable development have made urban compaction a popular policy direction in many U.S. cities and metropolitan areas. However, critics have pointed out that although this policy direction may have

both theoretical and political appeal, it attempts a reversal of existing urban development trends, which might be neither a desirable nor feasible planning goal. Density has been overemphasized in the war on sprawl and parks in cities tend to be viewed as optional amenities rather than necessary components of urban infrastructure. Our findings suggest the potential of the “green infrastructure” approach being a new avenue to improve individual well-being and strengthen social cohesion as parks may act as effective glue for family ties and the community fabric.



11) Behavioral Correlates of Awareness of a Large-scale, Self-service Bicycle Program: Potential for a Modal Shift toward Active Transportation

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Background:
It is thought that increasing the accessibility and user-friendliness of active transportation services will support increases in the number of persons meeting public health recommendations for physical activity. Few environmental interventions aimed at improving the accessibility and user-friendliness of active transportation have been evaluated. BIXI (www.bixi.com) is a large-scale self-service bicycle rental program being implemented in Montreal, Quebec. The BIXI intervention consists of making available 5000 bikes at 400 bicycle docking stations throughout Montreal's central, more urbanized neighborhoods. Similar self-service bicycle programs exist in Western Europe (e.g., Velib in Paris, France and Velo'v in Lyon, France) but the impact of such programs on active transportation has not been examined. It is unclear whether persons not engaged in active transportation are aware of the availability of such services.

Objectives:
We evaluated awareness of the BIXI intervention across persons currently not engaging and engaging in walking or cycling at frequencies and durations that were either under (3 times per week for 30 minutes), met (5 times per week for 30 minutes), or exceeded (7 times per week for 30 minutes) public health recommendations for physical activity. Relationships were evaluated bivariately and multivariately while accounting for living in neighborhoods where BIXI bicycles were available, showing favorability to policies aimed at making neighborhoods more active living friendly (e.g., building more bicycle lanes, reducing speed of vehicular traffic), having a driver's permit, having access to a motor vehicle, and demographic (e.g., age and sex) and socioeconomic (e.g., income and education) factors.

Methods:
The BIXI intervention was implemented by an independent company on May 12th 2009 through a contract awarded by the City of Montreal. A population-based sample of adults was recruited to participate in a 20-minute telephone interview seeking information on awareness of BIXI, frequency and duration of involvement in walking and cycling, self-reported health, demographic and socioeconomic characteristics, and favorability to policies aimed at making neighborhoods more active living friendly. The sampling plan involved random digit dialing for a subset of the target sample (n=1400) and targeted sampling of telephone numbers corresponding to residential addresses in neighborhoods where BIXI bicycles were available (n=601). Data collection occurred between May 4th and June 10th 2009. The response rate for the survey was 32.6%. The final sample included 2001 adults aged 18-94 years (55% female). The data were analyzed using multilevel logistic regression to account for clustering of respondents within neighborhoods. Analyses are adjusted for age, sex, education, income, country of origin, favorability to active living policies, driver's permit, and car accessibility.

Results:
Descriptive analyses indicated that 52.8% of respondents reported that they had heard about BIXI and were able to correctly describe the BIXI service. Amounts of recreational walking not associated with likelihood of BIXI awareness included recreational walking 3 times per week for 30 minutes (ORadjusted =1.01, 95% CI: 0.8, 1.3), 5 times for 30 minutes (ORadjusted =0.87, 95% CI: 0.7, 1.1), and 7 times for 30 minutes (ORadjusted=0.83, 95% CI: 0.6, 1.1). A greater likelihood of BIXI awareness was associated with utilitarian walking 3 times per week for 30 minutes (ORadjusted=1.53, 95% CI: 1.2, 2.0), 5 times for 30 minutes (OR=2.13, 95% CI: 1.1, 4.4), and 7 times for 30 minutes (ORadjusted=1.72, 95% CI: 1.2, 2.5). Cycling for any motive 3 times per week for 30 minutes (ORadjusted=2.75, 95% CI: 1.6, 4.8) and 5 times for 30 minutes (ORadjusted=2.23, 95% CI: 1.1, 4.5) were associated with significantly greater likelihood of awareness of BIXI whereas cycling 7 times for 30 minutes (ORadjusted=1.46, 95% CI: 0.6, 3.3) was not associated with awareness of BIXI.

Conclusions:
These results indicate that persons currently engaging in active forms of transportation such as utilitarian walking and any form of cycling were more likely to be aware of the BIXI service. Furthermore, although associations were attenuated in accounting for various demographic, socioeconomic and favorability factors, they remained statistically significant. Our data suggest that those people most likely to become aware of the new service are those who are already engaging in some form of active transportation. Eliciting a modal shift toward active transportation may require additional, more targeted interventions to promote greater awareness and ultimately, greater active transportation. Data collection planned for the fall of 2009 will allow for determining whether the BIXI service has induced a modal shift toward active transportation in the target population.

Support:
Research reported in this abstract was supported by LG's CIHR/CRPO (Canadian Institutes for Health Research/Centre de recherche en prévention de l'obésité) Applied Public Health Chair on Neighborhoods, Lifestyle, and Healthy Body Weights. DF is supported by a SSHRC (Social Sciences and Humanities Research Council of Canada) Doctoral Fellowship.

12) Physical Education, Health and Equal Justice

Robert Garcia, BA, JD

Los Angeles, The City Project

The Los Angeles Unified School District, the second largest in the nation, adopted a policy on *Physical Education Program Compliance with Equal Protection Laws* in June 2009, BUL-4742.0. The school district adopted the policy under physical education and civil rights laws in response to the physical education campaign by The City Project working with a diverse alliance to help students move more, eat well, stay health, and do their best in school and in life.
This is the first time the school district has explicitly applied the civil rights laws to physical education and health disparities through a district wide policy. This policy is a best practice example of a public agency implementing policy change, and social change through law, to improve physical education, reduce obesity, and alleviate health disparities.

The policy relies on evidence-based research documenting the importance of quality physical education teachers and programs to improve student health, youth development, and academic performance, and to alleviate health disparities based on income, race, color, and national origin. The policy seeks to ensure compliance with the school board's resolution, physical education requirements, and civil rights laws, including Title VI of the Civil Rights Act of 1964 and its regulations, and California Government Code Section 11135 and its regulations. Those laws prohibit recipients of public funds, including the school district, from engaging in practices that have the intent or *effect* of discriminating based on race, color or national origin. The school district seeks to comply proactively with those equal protection laws by providing quality physical education to all students.

At a time when civil rights enforcement can be difficult to achieve, the school district's policy is consistent with the recent United States Supreme Court decision in *Ricci v. DeStefano* (June 29, 2009), commonly known as the New Haven firefighters' case. The Supreme Court there recognized the principle that voluntary compliance through the planning process is the preferred means of achieving the objectives of the equal protection laws. The Court held that a strong basis in evidence of impermissible disparate impacts based on race, color, or national origin during the planning process can justify a race-based remedy under Title VII of the Civil Rights Act of 1964, which prohibits employment discrimination. Title VII disparate impact cases including *Ricci* are relevant to interpret the Title VI disparate impact standard, as applied by the school district in the policy.

The school district through the planning process relied on a strong basis in evidence of impermissible disparate impacts in physical education and health to remedy deficiencies in physical education. The strong basis in evidence includes empirical research on disparities in physical education and health based on race, color, or national origin. Indeed, the policy statement cites evidence of a history of intentional discrimination in public schools. In addition, the policy adopted by the school district is not race based, unlike the remedy at issue in the *Ricci* case. The remedy adopted by the school district is race-neutral and requires improving physical education for all students.

The school district's policy is a response to the physical education campaign by The City Project working with a diverse alliance. The campaign includes several elements. First, the teachers' union, United Teachers of Los Angeles (UTLA), organized a public campaign to support physical education in public schools. Second, The City Project and various youth, social justice, and health organizations and parents filed administrative complaints with the school district. Third, the school board passed a resolution to enforce the physical education and civil rights laws. Fourth, school officials working with The City Project are working on an implementation plan to enforce physical education laws requiring 20 minutes of physical education in

elementary schools, and 40 minutes in middle schools and high schools. Finally, the campaign relies on evidence-based research to document the importance of physical education and health disparities based on income, race, color, and national origin. The diverse allies include parents, a physical education teacher, Anahuak Youth Sports Association, California Pan Ethnic Health Network, Concerned Citizens of South Central Los Angeles, and Prevention Institute.

The school district's policy underscores the effectiveness of the strategies that The City Project has relied on for years to persuade recipients of public funds to enforce equal justice protections. Two of the key strategies include voluntary compliance with civil rights laws through the planning process outside the courts, and multidisciplinary research and analyses to build a strong basis in evidence to support social change through law.

Important work remains, however - monitoring compliance by the school district with the policy and laws in the years to come to ensure students move more, eat well, stay healthy, and do their best in school and in life.

The school district's policy statement is available on the web at tinyurl.com/m5lql6.

13) PEQI: A Tool to Engage Community and Evaluate Pedestrian Quality

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Human Impact Partners

Background:
The Pedestrian Environmental Quality Index (PEQI), developed by the San Francisco Department of Public Health's (SFDPH) Program on Health Equity and Sustainability, is an observational survey designed as a user-friendly checklist. It enables users to collect, quantify, and visually display data on street- and intersection-level built environment conditions. The PEQI includes indicators on traffic, street design, land use, intersections, and perceived safety factors. It draws on published research, walkability efforts from numerous cities, and national expertise. SFDPH developed the PEQI to quantify the need for pedestrian improvements, for use in city planning; to educate community members about environmental factors that influence walking; and to fill local data gaps on the street environment, for use in health impact predictions of key health determinants such as physical activity. Public health agencies, university researchers and students, and environmental justice advocates in numerous community-based planning efforts in California and other states have used the PEQI.

Human Impact Partners (HIP), a nonprofit organization based in Oakland, California that specializes in Health Impact Assessment, recently trained East Palo Alto (EPA) residents - including members of a community youth organization - to use the PEQI in an area of the city slated for redevelopment. EPA is a 2.5 square mile city of nearly 30,000 located 35 miles south of San Francisco. It is a largely residential city with a low tax base that limits its ability to provide essential services, public facilities, and infrastructure for its largely poor, minority residents. These limitations are reflected in the city's overall population health. A 2006 fitness assessment found that only 7% of seventh graders in EPA's local public schools met all fitness standards compared with 37% in the surrounding county. Similarly, the prevalence of obesity is higher in EPA than in the rest of the county. In 1998-2000, EPA had the highest asthma hospitalization rate in the county for children ages 0-14. Between 2002 and 2004, rates of asthma increased significantly among children ages 0 to 18.

Objectives:
Human Impact Partners' objectives for training EPA youth and community residents to use the PEQI included: 1) gathering data to advocate for pedestrian quality improvements in a forthcoming business district redevelopment plan, and 2) building the capacity of local organizations to prioritize pedestrian safety and quality in future land use planning.

Methods:
HIP led a three-hour PEQI training and practice session in EPA for two staff from the county public health department and 14 youth from local community organizations. After the training, participants collected data on the conditions of EPA streets and intersections for 2.5 hours. Subsequently, one HIP staff member filled data gaps with seven hours of data collection.

With guidance from SFDPH, HIP staff then entered the PEQI data into an MS Access database that assigned values to the data collected, applied weights, and calculated a final score for each intersection and street segment. The final PEQI scores reflect the degree to which street segment and intersection design incorporated environmental factors supportive of walking and pedestrian safety.

Results:
The group gathered data on approximately 16% of intersections and 18% of street segments in East Palo Alto, focusing on locations adjacent to the proposed redevelopment area. Preliminary results reported that 89.9% of intersections and 11.2% of street segment sides for which data was collected had poor or low pedestrian condition environments. Data for street segments was collected and reported for each directional side because conditions can differ even on the same street segment. In collaboration with local public health and community stakeholders, HIP used the East Palo Alto PEQI data as part of a Health Impact Assessment of a downtown business district redevelopment proposal.

As a result of collecting PEQI data, public health and community participants anecdotally reported increased awareness of the impact of the built environment, saying that is was “fun” and “eye-opening.” In addition to using the PEQI results to advocate for improved conditions in current city planning processes, training participants expressed interest in using the PEQI in their future work.

Conclusions:
The PEQI is a tool available online that public health departments, transportation departments, and community organizations can use, once trained, to raise awareness among youth and other community members of pedestrian environmental quality. It also engages community members in local land use planning processes about walking conditions and street improvements. The PEQI application in EPA exemplifies one way to translate health research into a checklist that community members can use and to increase their understanding of the connections between street design and physical activity. SFDPH continues to refine the PEQI. Both SFDPH and HIP have ongoing efforts to encourage planners, public health departments, city agencies, and community organizations to use the PEQI in their work to create environments that facilitate safe, active lifestyles in urban areas.

Support:
Funding for HIP's work in East Palo Alto was provided by The California Endowment.

14) Do Observed Levels of Physical Activity in Neighborhoods Correspond to the Features of that Neighborhood?

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Background:
A lack of physical activity is one of the main factors contributing to obesity. Environmental audit tools can tell us about features of the environment that promote or detract from physical activity. However, studies have not shown how these features relate to actual physical activity occurring in the assessed environment. As part of the baseline assessment of the affects of an urban greenway on physical activity, observations of the physical activity levels of residents living within a half mile of the proposed greenway were made. Additionally, the same neighborhoods were assessed for the features that promoted or detracted from physical activity. The Lafitte Greenway in New Orleans, Louisiana is a three-mile linear corridor of undeveloped land targeted for development in the near future. A comparison between objectively measured physical activity levels with features of the environment will help researchers and policy makers target components of the environment that promote physical activity.

Objectives:
To compare observed physical activity levels to ratings of environmental features that promote physical activity and to compare two environmental audit tools aimed at assessing the relationship between the physical environment and physical activity.

Methods:
Neighborhoods within a half-mile adjacent to the Greenway were divided into eight driving routes. Physical activity observations using momentary sampling techniques (the SOPLAY methodology adapted for driving observations) were used to assess physical activity levels of residents. Trained, certified individuals observed activity levels for 8 weeks between 4-6pm on weekdays and 3-5pm on weekends. Each route was observed a total of eight weekdays and eight weekend days. Reliability checks were conducted on each route for the weekday and weekend schedules.

Two environmental audit tools (Irvine Minnesota Inventory and Systematic Pedestrian and Cycling Environmental Scan (SPACES) will be used to characterize the same neighborhoods adjacent to the Greenway. Neighborhoods will be scored according to the features that promote physical activity. The same two assessors will rate each segment. Segments will be rated using each tool simultaneously. Segments will be sampled according to the Irvine Minnesota protocol. Several segments will be assessed in order to be representative of each of the eight neighborhoods. Inter-rater reliability will be assessed. Summary measures will be determined for each audit tool by neighborhood.

Results:
Physical activity observations are complete. The environmental audits will be complete by the end of November. Total numbers of individuals being moderately and vigorously active as well as sedentary will be shown by gender and age group (youth or adult). Results will be summed for each neighborhood. We will also be able to identify if activity is occurring in the open green spaces and parks in the areas or on the streets in the neighborhoods. T-Tests between mean numbers of active individuals will be used to determine if significant differences exist between neighborhoods, genders and age groups. We will compare the environmental audit ratings to observed physical activity levels by neighborhood. Pearson correlations will be run to see if an association exits between audit rating score and percentage of individuals who are moderately

to vigorously active. We will do this for each audit tool for each neighborhood. Comparisons between audit tools will also be made to determine their ability to distinguish features of the environment as related to observed physical activity levels.

Conclusions:
This assessment is a unique opportunity to simultaneously compare two environmental audit tools across several neighborhoods and relate the findings to objectively measured physical activity levels in the same neighborhoods. We will be able to determine if there is a correlation between observed physical activity levels and features of the environment.

Support:
This research is supported by the Robert Wood Johnson Foundation's Active Living Research Program, grant # 65700.

15) Assessment of the Built Environment in a Racially Diverse, Urban Community in Kansas City, Kansas

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Background:
Tackling the current overweight and obesity epidemic involves not only individual responsibility, but community action as well. As former Surgeon General Satcher succinctly stated, "Individual behavioral change can occur only in a supportive environment with accessible and affordable healthy food choices and opportunities for regular physical activity." Accordingly, as part of a faith-based initiative, we conducted assessments of various aspects of the built environment that contribute to obesity by affecting eating and physical activity behaviors and facilitating sedentary lifestyles in a small community (<15,000 individuals) in one of the poorest counties in Kansas. The assessments were one of the first steps in a faith-based advocacy project, the Healthy Kids Initiative, which aims to prevent childhood obesity by increasing access to healthy foods and opportunities for physical activity. The Healthy Kids Initiative is a partnership formed among individuals from business, religious, and academic entities, which includes the Rosedale Development Association, the Rosedale Ministerial Alliance, KC Healthy Kids, and the University of Kansas Medical Center.

Objectives:
The primary aims of this study were to assess the characteristics of community parks and playgrounds and the barriers and challenges to community members to safely bike or walk to local schools and parks. In addition, the availability and cost of healthy foods was assessed at each of the corner stores. Information gained from these assessments will be used to advocate and inform elected officials to support community improvements to promote and encourage healthy lifestyles.

Methods:
For both the walkability and bikeability assessments, we plotted common routes traveling through and around neighborhoods to the local corner stores, parks, and schools within the community. Within the community, there were 6 corner stores, no supermarkets, 4 parks, and 5 schools. Evaluation items included condition of walking and biking surfaces, availability of crosswalks, driving behaviors and motor vehicle activity, safety rules, and aesthetics. Items were rated using a Likert scale, from 1 (awful) to 6 (excellent). The park and playground assessment was constructed using questions from established evaluation tools along with items addressing concerns from community members, including accessibility of local parks, safety, equipment condition, landscaping, and overall cleanliness. The corner store assessment tool was constructed using questions adapted from other evaluation instruments and assessed the availability and cost of healthy foods compared to full-service supermarkets located outside of the community. Along with the assessment tools, documentation through digital photography and field notes were taken. Inter-rater reliability of the park, playground, and grocery store items was outstanding (Kappa >0.80) between the two raters. Finally, a survey was administered to members of the faith-based coalition to ascertain their views about the needs of the community.

Results:
Assessment results indicate that several improvements need to be made to enhance the community's built environment. Many areas of the community lacked sidewalks and crosswalks or they were in poor condition. Narrow, steep roadways also posed challenges for walkers and bikers. The park and playground assessment revealed several safety issues, including lack of recommended surfacing material under playground equipment and inadequate fall zones, and maintenance issues including broken equipment. Litter and lack of cleanliness was evident in many areas of the parks with restroom facilities unusable or not available. Based on the corner store assessments, only four of the six stores carried a limited selection of fresh fruits and

vegetables with variable freshness and quality. Most of the stores prominently marketed high-caloric sweetened beverages or high-saturated fat foods while selections of nutrient dense, low-fat, whole grain, or low-fat dairy products were limited. A total of 27 members of the faith-based coalition completed the community survey. Results from this survey indicated that safety and lack of sidewalks and crosswalks were of major concern for participating in physical activity. Furthermore, the majority of community members (93%) indicated that they shopped at larger supermarkets located outside of the community.

Conclusions:
In order to encourage and promote physical activity, future community plans and policies need to be explicit about addressing health. From the assessments, numerous issues need to be addressed to improve the built environment, including expansion of and repairs to sidewalks and roadways, replacing playground equipment, and increasing accessibility to parks by adding sidewalks and crosswalks, and increasing access to healthy foods within the community.

Support:
This project was made possible with funding by the Robert Wood Johnson Foundation.

16) OPT (Obesity Prevention Toolkit) for Healthy Neighborhoods: An Approach to Community Assessments That Develops Social Cohesion in Low-Income Neighborhoods to Improve the Built Environment

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Background:
Approximately 400,000 deaths each year in the United States are directly attributable to poor diet or physical inactivity. Many of the factors leading to poor diet and physical inactivity can be attributed to the built environment.

Built environment indicators are created or modified by people and can include housing, schools, workplaces, parks and recreation, businesses and transportation systems. Assessing the built environment is an important first step to the creation of policy change. However, community values and current community decision-making processes should be incorporated into a policy agenda for built environment change. The OPT (Obesity Prevention Toolkit) for Healthy Neighborhoods program is a process that incorporates community participatory assessments to create a meaningful advocacy agenda to drive neighborhood change.

Objectives:
The primary aim of OPT (Obesity Prevention Toolkit) for Healthy Neighborhoods is to systematize an advocacy agenda that is driven by neighborhood-level built environment assessments and community decision making.

The OPT program aims to:

- Engage neighborhood residents in the development of policies that positively impact the health of neighbors.
- Develop neighborhood-based built environment indicators that can be used to systematize and coordinate projects throughout the community.
- Create opportunities for physical activity and healthy food options by identifying and recommending appropriate policies.

Methods:
Health Policy Research Northwest (HPRN) is piloting OPT in the low-income Trainsong neighborhood of Eugene, Oregon, which is comprised of 658 households. The pilot began in July 2008 and will continue until June 2010.

OPT's first phase involves working with neighborhood residents and other stakeholders to determine the most urgent and appropriate issues to address, based on assessment findings. The assessment component gives neighborhood residents and OPT partners a data-driven platform for articulating problems, identifying the scope of disparities and sustaining engagement. The OPT assessment component includes collecting data to measure:

- Food Security: Reference USA data detailing supermarket locations, fast food density, convenience store location, local produce stands, and farmers markets.

- Built Environment:

    - GIS (Geographic Information System) data detailing sidewalk prevalence, street connectivity, public parks and open spaces, public transportation, population density, and bike paths.
    - Accessibility and affordability of local food outlets: HPRN developed community self-report survey tool detailing food availability and pricing comparisons.

  - Access to recreational spaces and alternative transportation: Pedestrian and Bicycle Information Center, RWJF and Department of Transportation community self-reporting tools detailing safe places to walk/ride, behavior of drivers, perception of safety and pleasantness and barriers to walking/biking.
  - Security and safety of recreational spaces: National Program for Playground Safety self-report tool detailing access to safe parks and playgrounds and satisfaction with amenities and characteristics of parks and playgrounds.

- Socioeconomic Factors: Census data detailing income levels, poverty levels, educational attainment and number of residents under 18.

OPT's second phase engages the community in creating and advocating for a policy agenda. This process includes:

- Review assessments and identify key findings.
- Organize neighborhood forums to discuss findings.
- Prioritize and/or revise policy or environmental recommendations.
- Meet with decision-making bodies to identify appropriate funding avenues and/or process steps to pursue for priority recommendation(s).
- Review and approve final agenda.
- Train and support neighbors to present assessment findings, recommendations, and budgetary needs to appropriate decision-making bodies.
- Report back to neighborhood forum.

Results:
The results of the assessment component in Trainsong pointed to multiple built environment deficiencies including healthy affordable food options, youth physical activity access, positive park activities, safe bicycle use among youth, and transportation options. As a result of neighborhood input and engagement, the following changes have been completed or are to be addressed by the appropriate decision-making bodies: 1) Re-formation of Neighborhood Association, 2) Increase in positive park events, including the organization of Celebrate Trainsong BBQ and Music event, Helmet Awareness Month, Neighborhood Association annual gathering, Trainsong Movie Night, and the building of a park kiosk for posting information; 3) Increase security measures in the park by installing more lighting and barrier fencing and 4) Increase food access and education through the organization of a weekly produce stand and monthly cooking classes.

Conclusions:
Evidenced based assessment tools collect the data necessary to provide a platform for community engagement. However, community participatory assessments encourage direct engagement in the policy process. The results of the OPT project highlight the importance of incorporating the community perceptions of the built environment. GIS allows users to incorporate and accurately manage several types of data to accurately assess both social and neighborhood environments. Together, community assessment and GIS mapping effectively incorporate data into the development of comprehensive neighborhood-level advocacy plans. Our research adds to the growing body of evidence that shows there is a relationship between community engagement and increased policy effectiveness. OPT can be replicated and applied in other neighborhoods to develop sustainable policies that may mitigate obesity.

Support:
HPRN has received financial support from the Northwest Health Foundation and the Union Pacific Railroad Foundation.

17) The Contexts of Children's Sedentary Activities: Where, with Whom and How do They Feel?

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Background:
A growing body of research shows a link between sedentary behavior and increased risk of overweight and obesity, specifically in children. Sedentary behavior in youth is also associated with physical inactivity, which is thought to lead to physical inactivity in adulthood and increased risk of chronic, obesity-related diseases. Measuring these sedentary activities, however, is often done by using multiple day activity recalls, which have some limitations including the accuracy of memories, especially for younger children. Recall measures also make it difficult to record social and physical contexts as well as feelings that occur during those activities. Ecological Momentary Assessment (EMA) methods allow researchers to obtain this data in real time by measuring what children are doing, and where, with whom and how children are feeling during these activities.

Objectives:
To describe the social and physical contexts and associated positive and negative emotions during sedentary activities among 4th - 8th grade children in Southern California, as measured through electronic EMA using cell phones.

Methods:
Participants were 44 fourth through eighth grade boys and girls living in Southern California (61.4% female). Each child received 20 prompts on a cell phone (HTC Shadow) between Friday at 4pm and Monday 8:30 pm, excluding school hours on Monday. The prompts consisted of questions about their primary activity (e.g., watching TV/movies, playing video games, active play), location (e.g., home, outdoors), whether they were alone, and current mood (e.g., happy, stressed, mad/angry, sad). The entire sample of 44 children was included in the analyses as each had at least one sedentary activity report (i.e. watching TV/movies, playing video games, reading/computer/homework, riding in a car). Descriptive statistics characterized the extent of sedentary activities, contexts and reported mood.

Results:
Participants reported a sedentary activity (i.e., playing video games, reading/computer/homework, watching TV/movies, or riding in a car) as the primary activity in 37.8% of EMA prompts. Watching TV/movies accounted for the largest number (51.8%) of sedentary activity reports followed by reading/computer/homework (21.4%), riding in a car (15.1%), and playing video games (11.7%). Sedentary activities considered to be largely voluntary for children - watching TV/movies and playing video games - constituted 81.6% and 18.4% of all reports, respectively. The majority of these particular sedentary activities occurred in the home (71.3%), followed by someone else's house (11.5%), someplace else (7.6%), outdoors (3.8%), car/van/truck (3.2%), school (1.3%), and gym/recreation center (1.3%). Only 19% of TV/movie watching and playing video games occurred alone. The most frequently reported social company was family (parents and siblings) (52.4%), followed by multiple categories of people (e.g., friends and family together) (26.5%), friends (1.4%), and classmates (0.7%). During these activities, children reported feeling extremely or quite a bit happy about 47% of the time, and not at all sad about 70%. Additionally, between 61% and 71% of children reported feeling not at all stressed, mad/angry or nervous/anxious.

Conclusions:
The current study highlights a unique research method to gain real time reports about sedentary activity contexts and moods for children aged 10-14. Watching TV/movies was the most commonly reported sedentary activity and occurred most frequently at home with family members. Sedentary activities rarely occurred in other contexts such as someone else's house, someplace else, car/van/truck, outdoors, school, or gym/recreation center or with other peers. Mood reports while watching TV/movies and playing video games were generally highly positive and not at all negative. These results offer novel information about where, with whom, and how children feel during sedentary activities - an area that has received limited research attention. Findings may help researchers begin to understand why children engage in these types of activities and how to curtail their frequency of occurrence. These preliminary results provide a framework for replication with a larger sample.

Support:
Robert Wood Johnson Foundation Active Living Research Rapid-Response grant #65837 (Dunton, PI) and National Cancer Institute grant #R01-CA-123243 (Pentz, PI).

18) Partnering to Enable Active Rural Living

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Background:
Rural residents and communities face many challenges as well as opportunities for promoting physical activity, health, and well-being that are different from those found in urban and suburban settings. Rural residents' perceptions of physical activity, including characteristics of the social and physical environments that support or create barriers to physical activity, are understudied and poorly understood. Thus, promoting active lifestyles in rural populations requires preparation and considerations that are tailored to these areas. Any attempt to promote physical activity must engage the residents in the process and give adequate attention to the unique characteristics of rural residents as well as their perceptions of physical activity environments, the rural landscapes in which they live, work, and play.

Objectives:
Applying a people and places framework, which is based on the social ecological model, our aim was to partner with rural communities, and work with community members to identify the physical activity environmental factors, as well as the personal and organizational factors, that enable or prevent active living by rural residents. Our objective was to establish academic-community partnerships that will enable active living in remote rural towns.

Methods:
Descriptive case study methodology at the community level was employed in two rural communities chosen because of their abundant natural resources yet distinguished by their community profiles. Access to the communities was secured via the elected boards (selectmen and planning), who were identified as key stakeholders and gatekeepers. Data were collected using rapid ethnography, involving direct observation, key informant interviews, surveys, focus groups, and photographic resource mapping. Participants were recruited from a convenience sample of year-round, full-time residents of the site communities who volunteered by responding to flyers and advertisements posted in public community venues (e.g., post office, town hall, library, and local papers) as well as face-to-face recruiting using a snowball sampling technique. Responders who expressed interest and provided contact information were contacted by a member of the research team. Volunteers were invited to qualify the physical activity environment in their community through project activities, including photo mapping, focus groups, and town meetings. Key informants were interviewed using a semi-structured format. The content of qualitative data from field notes, direct observations, focus groups, photo maps, and interview transcripts were analyzed using a constant comparative method at each conceptual level of influence and triangulated across multiple sources. Emergent themes were examined in relationship to our theoretical framework and used to structure a conceptual model of activity-friendly rural towns. Project outcomes, our model and site-specific reports, were shared with key stakeholders, including rural residents, coalitions, and communities.

Results:
Project outcomes provided information describing the social ecological factors that support daily, health-enhancing levels of physical activity and define physical activity enabling rural environments. Thematic categories emerged across individual, social, and physical environmental levels. At the individual level, factors that supported active rural living included a value for and strong beliefs in the benefits of active lifestyles regardless of the real or perceived environmental obstacles. Thus, people who valued an active lifestyle and believed in the benefits of active living found ways to be physically active regardless of the

situational and/or environmental obstacles. At the environmental level, categorical barriers were identified in the area of active transportation routes, access to structured programs, and long-term support (financial and personnel) for emerging opportunities. Both of our host communities were rich with natural environmental resources for winter and summer recreational physical activities, including walking, hiking, and ski trails, rivers and ponds, and bike routes; yet, only the residents who were interested in and valued these types of activities used the resources.

Conclusions:
Efforts to promote active living in rural areas must consider how the attributes of people interact with the attributes of place when designing programs, modifying environments, and enacting policies that are expected to affect individual behavior.

Support:
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19) Association of Workplace Supports with Active Commuting

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Background:
Active commuting (AC) is the practice of walking or biking to work and offers a promising means to integrate recommended levels of physical activity into daily life routines (Dora, 1999; Tudor-Locke et al., 2001). Indeed, numerous health benefits from AC have been identified, including improvements in VO2max, HDL cholesterol, blood pressure, and insulin levels, and a reduced risk of obesity, cardiovascular disease, stroke, and all-cause mortality (Andersen, et al., 2000; Gordon-Larsen et al., 2009; Hamer & Chida, 2008; Lindstrom, 2008). Moreover, AC has the potential to facilitate positive social, environmental, and economic outcomes (Litman & Doherty, 2009).

Despite these benefits, rates of AC in the U.S. remain low. Data from the 2001 National Household Transportation Survey show that 91% of respondents reported an automobile as their usual mode to work, while only 5% took public transit and 3% walked (Hu & Reuscher, 2004). At the same time, surprisingly little research has examined influences on AC, especially among adults, with distance, motivations to avoid parking hassles, reduce expenses, increase one's health, and reduce air pollution, and an overall 18-item environmental index identified as salient correlates of AC (Craig et al,. 2002; Merom et al., 2008; Ogilvie et al., 2008). However, although research has looked at personal and community-level environmental influences on AC, few, if any, studies have examined how workplace supports are related to the likelihood of walking and biking to work.

Objectives:
The purpose of this study was to examine the association of cultural and physical workplace supports for AC with employee AC behavior.

Methods:
An online survey was conducted from August to December 2008. Participants were recruited through listservs, links from local websites, and fliers provided to large area employers. Eligibility criteria included living and/or working full or part-time in Manhattan, KS and physically able to walk or bicycle. In total, 375 people completed the survey. The mean age was 39.4$\pm$12.9 years and participants were primarily White (90%), female (61%), and highly educated (95% high school diploma or greater), which is very representative of the city population. Respondents indicated their gender, age, race, education level, and estimated walking time to work (dichotomized as less or greater than 20 minutes). Cultural supports for AC were measured with two Likert-type questions about i) perceptions that their employer encourages AC (recoded as 'none to a little' vs. 'some to a lot') and ii) the perceived number of co-workers who actively commute to work (recoded as 'none' vs. 'some'). A dichotomous variable was then created specifying participants with neither type of cultural support or those with at least one cultural support. Physical supports for AC were measured with three 'yes/no' questions about the presence of bike parking, bike storage policies, and showers/lockers at the workplace. These variables were summed to designate respondents with zero, one, or two or more of the three types of physical supports. Participants were also asked to indicate the number of times per week they walked and biked to or from work, and a dichotomous AC outcome variable was created indicating zero trips versus at least one trip by foot or bike. Binomial logistic regression was used to predict the likelihood of AC at least once per week according the presence of cultural and physical workplace supports, with the zero supports category as the reference group for each model.

Results:
About one-quarter (26%) of the sample reported actively commuting to or from work at least once per week. Three-quarters (76%) reported that their workplace possessed at least one (of two) cultural supports for AC. About one-third (30%) reported their workplace had zero (of three) physical supports for AC, while 35% and 36% reported one and two or more physical supports, respectively.

In multivariate models controlling for age, gender, race, education, and perceived walking time to work, persons who reported one or more cultural supports for AC were more likely to actively commute at least once per week (*B*=2.56, CI=1.19, 5.98). Likewise, persons who reported two or more physical supports for AC were significantly more likely to actively commute at least once per week than those who reported none (*B*=2.46, CI=1.10, 5.47), but participants reporting only one physical support were not (*B*=.73, CI=.31, 1.71).

Conclusions:
The present study found that individuals with a more supportive cultural and physical environment were more likely to walk or bike to work, and it thereby suggests possible strategies to increase AC behaviors. Most salient perhaps are some of the recent government policies offering tax breaks or other financial incentives for employers to encourage AC among employees (e.g., provisions in H.R. 1424). Other approaches could target social support and cultural norms around AC within a workplace (Wen et al., 2005). In summary, this study adds to the small body of existing literature concerning AC, and provides understanding about the social-ecological influences on this behavior beyond the individual.

20) Talking the Talk, Walking the Walk: The Interactive Effect of Social Connectedness and Neighborhood Walkability on Physical Activity

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Background:
Physical activity (PA) researchers and promoters increasingly adopt social ecological models to better understand how social and physical environments impact upon active living (Sallis, Owen, & Fisher, 2008). A growing body of research demonstrates that 'walkable' neighbourhood designs are conducive to improving PA (Frank et al., 2003; Handy et al., 2002; Saelens et al., 2003). Indeed, dimensions such as dwelling density, intersection density, land use, and net retail area (Leslie et al., 2007) combine to encourage walking for transport (du Toit et al., 2007) and recreation (Lund, 2003). Various factors related to neighbourhood social capital may also be positively associated with PA (Leyden, 2003) in that a sense of familiarity and trust between neighbors and their neighborhoods creates a safe and supportive environment for walking and other active behaviors. In turn, neighborhood-based PA presumably facilitates opportunities for local social interaction and the development of mutual respect and community cohesion.

Objectives:
Despite these acknowledged environmental and social effects, no study has considered the compounding effects of both walkability and social capital on neighborhood-based PA. By better understanding these effects, urban planners and health promoters can use this information to advance improved conditions for healthier communities. Thus, the purpose of this study is to examine the interactive effect of walkability and connectedness on PA.

Methods:
This paper was developed from a larger study that involved randomly-selected households from four neighborhoods in a mid-sized Canadian city (N= 585; response rate = 60.9%). It uses the data from 384 participants - one from each unique household that participated in the study. Participants completed a detailed 7-day PA log booklet in which they recorded the location and purpose (e.g., recreation, transportation) of all episodes (>10 min). Location descriptions recorded as open-ended text were coded for whether they occurred within the participant's neighborhood, and total minutes of neighborhood-based PA for each of the purposes of recreation and transportation were then determined.

Participants also completed a questionnaire addressing a variety of PA correlates. Perceptions of neighborhood walkability were captured using the Neighborhood Environment Walkability Scale (NEWS) (Saelens et al., 2003). Three key dimensions of the NEWS - residential density, land use diversity, and street connectivity - were used to derive a walkability index by standardizing and summing the three components (cf. Frank et al., 2005). Neighborhood connectedness was measured by taking the mean of a five-item scale (e.g., "People in this neighborhood can be trusted"; alpha=.83) developed by Sampson, Raudenbush and Earls (1997). Using the medians for the walkability and connectedness variables, four groups were created (e.g., high walkability, low connectedness). Two factorial ANOVAs were used to examine the number of minutes of neighborhood-based recreational and transport-related PA across the four walkability/connectedness groups, controlling for the personal variables of age, gender, and BMI.

Results:
Approximately one-third (32.9%) of the 3750 total episodes described by participants occurred within their neighborhoods, with an average of 88.2 minutes of recreational neighborhood PA and 13.7 minutes of transport-related neighborhood PA reported. Participants who characterized their neighborhood as high in both walkability and connectedness displayed the greatest levels of both recreational (M=130.6 min) and transport-related (M=24.5 min) PA during the study week. These values were significantly higher than the other three groups (recreational $F=11.36$, $p<.01$; transport-related $F=8.12$, $p<.01$). However, the high walkability/low connectedness group had significantly greater *transport-related* PA (M=16.2 min) than the two low walkability groups, while the high connectedness/low walkability group had significantly greater *recreational* PA (M=108.7 min) than the two low connectedness groups.

Conclusions:
The compounding effect of perceiving both high walkability and high connectedness translated into greater levels of both recreational and transport-related neighborhood PA, thereby underscoring the salience of the relationship between urban form and the social landscape of a neighborhood. Left to itself, walkability encourages PA for transport, a finding supported elsewhere (du Toit et al., 2007). Combined with a positive social environment where neighbors feel socially connected to each other, however, a walkable neighbourhood effectively becomes more attractive for *recreational* PA as well. This finding is similar to Lund's (2003) observation that strolling trips are positively correlated with sense of community. The presence of social capital within a neighborhood presumably reinforces healthy norms that encourage PA and characterizes a setting in which neighbors feel sufficiently secure to explore their surroundings. All told, then, physical activity promotion efforts should take into account both physical (e.g., land use planning) and social (e.g., walking group) environments, and future research should explore the combined influence of other physical (e.g., green space) and social (e.g., crime) factors as well.

Support:
Support for this study was provided by the National Cancer Institute of Canada via the Sociobehavioural Cancer Research Network and the Centre for Behavioural Research and Program Evaluation at the University of Waterloo.

21) Development of a Physical Activity Location Measurement System (PALMS) and Validation in Young and Old Populations Wearing GPS

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Background:
Activity in outdoor locations can have important benefits for health and well being in older adult populations and in children. There is increasing recognition of the importance of sedentary behavior, most of which occurs indoors. Thus, to improve health outcomes it is critical to accurately measure physical activity and sedentary time spent in- and outdoors. GPS devices linked with physical activity monitoring devices such as accelerometers (AC) and heart rate monitors (HRM) enables measurement of where and when individuals are active as well as their energy expenditure. GPS devices can be used to detect activity, but because of technical limitations to date, distinguishing between indoor and outdoor activity has been difficult. Some GPS devices now provide information about the number of satellites in view and the strength of the signal received. By calculating the signal strength ratio of satellites in view and satellites that are communicating accurately with the GPS device, it is possible to better estimate time spent indoors and outdoors. Moreover, given the rapid pace of technological advances in the areas of GPS, HRM and AC there is a need to establish best practice among ALR researchers engaged in PA location-based research.

Objectives:
The aim of this presentation is two-fold: a) Demonstrate how to analyze concurrently collected GPS, HRM and AC data in a way that addresses inaccuracies of GPS data. The focus will be on cleaning and processing algorithms that allow data to be analyzed to identify indoor and outdoor activities. b) Demonstrate an online platform for researchers, PALMS which supports processing of GPS, HRM and AC data. The platform is device-independent and allows researchers to employ common methods to clean, process and analyze data. Data collected from three population groups (children, adults and older adults) will be presented to demonstrate the feasibility of measuring location based physical activity and sedentary behavior. These data will also be used to demonstrate how PALMS can be used to upload, visualize, analyze and share data.

Methods:
Adults: We purposefully recruited 19 adults (mean age = 29 years) from a variety of locations in San Diego. Participants were active in a variety of physical activity domains and included active commuters, regular walkers, recreation center users, active workers and cyclists etc. This design maximized variability in activity modes and locations. Participants wore a GPS unit (DG 100) and a HRM/AC device (Actitrainer or Actiheart) for a 7 day period. After a 2-3 day period participants met with researchers and recalled their day through map based visualization prompts; researchers verified activity bouts and irregular data points. This enabled researchers to develop algorithms to clean out of range data, identify trips, modes of trips and bouts of activity and inactivity. Participants also reported their satisfaction with the devices.

Older adults: Seventeen older adults (mean age = 80 years) from a large continuing care retirement community in San Diego were recruited. The design of the campus of this facility presented challenges for assessing in and outdoor activity with walking paths around the facility and many corridors for walking indoors. Participants wore a GPS unit (Qstarz), and a HRM/AC device (Actitrainer or Bioharness) for 7 days. Participants reported whether they had walked outdoors and their satisfaction with the devices. A subsample also completed the prompted recall.

Children: Twenty children aged 8-15 will be recruited from schools in San Diego county varying in size and neighborhood walkability. They will wear a GPS unit (Qstarz), and a HRM/AC device (Actitrainer or Bioharness) for 7 days, complete the prompted recall and satisfaction surveys.

Results:
Participants were comfortable wearing the devices and satisfied with the study components. Compliance with the study wearing protocol was high. We will present merged data collected from 2 different GPS devices and 3 different HRM/AC units. We will display raw and processed data to demonstrate the importance of smoothing and clustering GPS data and show algorithms to clean out of range data, to identify trips, modes of trips and bouts of activity and inactivity in multiple locations. We will map in and outdoor activity bouts, in particular in and around the retirement facility and schools and describe the calculations employed to more accurately identify in and outdoor activities based on the percent of available satellites. We will present novel ways of visualizing the data that can be powerful tools for policy makers. Will we show how HRM data improves the identification of active commuting trips. Finally we will demonstrate how PALMS allows researchers to use common methods to merge, process and analyze location and activity data.

Conclusions:
This study demonstrates the feasibility of collecting and analyzing GPS, HRM/AC data in young and old populations. Multiple data sources can improve the estimation of physical activity in specific locations. Algorithms have been developed and validated for researchers to employ through an online system.

Support:
NIH/NCI U01 CA130771-01 Patrick (PI)

22) Objective and Subjective Residential Context and Urban Children's Physical and Sedentary Activities

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Background:
Despite trends indicating a recent stabilizing in the upward obesity trend for children and adolescents in the U.S., child overweight remains a significant public health issue, with approximately one-third of children overweight or obese and 16% obese. One prominent explanation for the increase is that children are spending too little time playing outdoors and too much time in front of the television. Some analysts also argue that lack of outdoor time is due in part to mothers' fears about neighborhood safety. Despite the interest in childhood obesity in general and the role of outdoor activities in particular, very little work has examined the associations between children's activities, neighborhood characteristics, and weight status, using nationally representative data.

Objectives:
This paper fills this gap by addressing two research questions: first, we ask, are the activity patterns (outdoor play and television watching) of five-year-old children living in large cities associated with children's weight status? Second, we ask, is residential context associated with children's activity patterns? Specifically, we first test whether there are significant associations between outdoor play time and television viewing and body mass index (BMI) for five-year-old children and then we test whether maternal perceptions of collective efficacy, interviewer-assessed physical disorder outside the home, and neighborhood socioeconomic disadvantage are associated with children's outdoor play time and television viewing.

Methods:
Using Fragile Families and Child Wellbeing Study data (N = 2,210), a twenty-city cohort study of urban children comprised of in-depth, in-person and in-home interviews collected at birth and when the children are one year, three years, and five years old, the project uses multivariate negative binomial regressions to test associations between children's outdoor play time and television viewing and both objective and subjective neighborhood measures when the children are five years old.

Results:
We find that both hours of outdoor play as well as television viewing are significant predictors of BMI at age five in the expected directions; and that a ratio of outdoor time to television viewing is also a significant predictor of BMI. We also find that mothers' higher perceived collective efficacy is associated with more outdoor play time. Contrary to expectations, results also show that living in public housing is a strong predictor of both more outdoor play time as well as more television viewing; and that higher physical disorder outside the home is associated with more outdoor play.

Conclusions:
The negative influences of social and physical environments on children's physical activity are often construed as a result of mothers' decision to keep their children indoors for safety reasons. Instead, we argue that in poor communities, specific social conditions may give rise to higher rates of physical activity. In public housing projects where parents (especially mothers) are likely to be home during the day, and where a cohesive community may arise, children may have higher rates of outdoor physical activity. Moreover, these children of mostly non-working mothers may be less likely to be enrolled in preschool or daycare programs, and thus may have more unstructured time at home in which to play outdoors. It also is likely that public housing projects provide relatively safe places to play, such as courtyards or playgrounds that other poor

children who do not live in public housing may not have access to. The greater availability of unstructured time for these children may also explain why they also spend more time watching television.

Support:
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23) Geographic and Seasonal Differences in Park Use and Physical Activity

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Background:
Weather is often reported as a barrier to physical activity and time spent outdoors, yet the impact of seasonal change has not been consistently shown to have a substantial influence on PA at the individual level. Parks are common venues for physical activity, but are often underutilized given the populations they are intended to serve. Their use may reflect seasonal differences in weather patterns, school schedules, and field sports play.

Objectives:
To study park use across three different seasons to determine how seasonal differences affect park-based physical activity.

Methods:
We used SOPARC to observe park use in a total of 7 neighborhood parks across four cities: Albuquerque, NM; Durham, NC; Columbus, OH; and Philadelphia, PA. We studied parks in high- and in low- income neighborhoods. Observations occurred only during clement weather and were conducted 4 times per day for 4 days per week, including two weekend days in the spring, summer, and fall at each park. All observations were done during clement weather. We divided each park into discrete target areas and counted people in each target area by gender, age group, race/ethnicity, and activity level. We also noted whether activities in the parks were organized or supervised. Organized activities were defined as those that were scheduled, with apparent leadership by the park, school or other agency personnel (e.g., sport practices, league play, exercise classes). Supervised activities were defined as activities where a supervisor was in or adjacent to that specific area (e.g. available to direct park users and respond to emergencies), but did not have to be instructing, officiating, or organizing activities.

Results:
We found significant variation in park use within cities, across cities, and by season. Overall lowest park use was in the fall. Compared to fall, there were 18% more park users counted in the summer and 51% more in spring. There were almost twice as many organized activities in spring and fall than in summer. Summer had the most supervised activities, mainly due to camp programs. In summer supervised activities accounted for 14% of all individuals observed, and in fall, organized activities accounted for 16% of the total observed. Park activity areas were empty about 75% of the time, varying between 73% for Spring to 78% for Fall. Overall, the level of activity varied only slightly by season, with park users engaging in sedentary activity 58-63%, walking (moderate) 25-27% and vigorous activity 12-16%, with highest moderate to vigorous physical activity (MVPA) in the spring and lowest MVPA in the summer. Park use differed by city, with lowest use in North Carolina, which had the lowest neighborhood population density. Where two parks were observed within the same city, the number of people using the two parks varied as much as five-fold within the same season.

Conclusions:
There is substantial variability in neighborhood park use by season and also within and across cities. Part of the variation might be explained by differences in programming and staffing. Future analyses will include reports of park users and local residents with respect to their perception of park safety, knowledge of park programs and activities, and exercise behaviors and preferences. The consistent finding of low park use suggests that there is significant potential for improving population physical activity by attracting more park users.

Support:
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24) Evaluation of the NYC Active Design Guidelines: Baseline Survey Results

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Background:
Obesity and type 2 diabetes are epidemic in NYC and getting rapidly worse. The majority of NYC adults and 43% of elementary school children are overweight or obese. The NYC Active Design Guidelines is a policy initiative to create broad built environment changes for active living in NYC, with commitment from NYC Departments of Health and Mental Hygiene, Design and Construction (DDC), City Planning and Transportation. The Guidelines whose launch is planned for fall 2009 will be used by City agencies to incorporate Guideline recommendations into building, street and neighborhood construction projects. The Guidelines will be available on City websites and will be disseminated to private sector design professionals through design organizations like American Institute of Architects New York Chapter (AIANY).

The Active Design Guidelines:

- *Ch. 1. Environmental Design and the Control of Epidemic Diseases: Past and Present*
- *Ch. 2. Urban Design* - strategies for neighborhood/street design
- *Ch. 3 Building Design* - strategies related to stair and elevator design, and indoor/outdoor spaces for physical activity
- *Ch. 4. Synergies with Environmental Sustainability and Universal Design,* including discussion of the recently approved "Design for Health through Physical Activity" Innovation Credit created in NYC for Leadership in Energy and Environmental Design (LEED) green buildings certification.

Objectives:

- To share results of baseline survey of NYC architects on knowledge, attitudes and self-reported practices pertaining to physical activity promoting factors in building and environmental design.
- To share plans for other evaluation activities.

Methods:
Impacts of the Guidelines will be evaluated using three methods:

1) Pre (spring 2009)-post (early 2010) cross-sectional surveys of AIANY and DDC architects assessing knowledge, attitudes and self-reported practices regarding physical activity promoting design factors.
2) Pre (late 2009/early 2010)-post audits assessing incorporation of active design elements in DDC projects. Pre-audits will be of DDC projects completed prior to launch of the Guidelines.
3) In-depth interviews (early 2010) with 3-5 design teams assessing factors influencing adoption of physical activity promoting design elements.
   The anonymous baseline survey of knowledge, attitudes, and self-reported practices was administered over four weeks in spring 2009 to AIANY and DDC architects via SurveyMonkey.com. Three reminder emails were sent and a reminder was included twice in AIANY's weekly digest. Descriptive analyses were conducted using SPSS version 12. As an incentive for participation, respondents were invited to enter into a raffle to win one of two $150 prepaid credit cards.

Results:
Of the estimated 2,709 architects (2673 AIANY and 36 DDC) who received the web survey, 457 (17 %) completed all or part of the survey. Respondents were mostly male (79%), Caucasian (79%), had a mean age of 49 years and had been licensed for an average of 17 years. Respondents' gender and ethnicity/race were comparable to AIANY membership demographics.

Respondents indicated sources for new information for application to their design practice were AIA Continuing Education seminars (86%), websites (73%), design guidelines (56%), architectural conferences (52%) and research journals (32%).
Of the respondents, 165 (45%) worked on projects in neighborhoods of NYC identified as having high levels of obesity, and 46% worked on projects for the City of New York. Two-thirds (67%) had ever developed projects based on LEED. Ninety-four percent reported having clients interested in LEED certification.

About half or more of the respondents do not usually try to incorporate physical activity-promoting factors into their design of buildings: 54% say they often or always try to make stairs more prominent than elevators, 47% incorporate exercise facilities in residential buildings, just over 30% include showers and/or lockers in non-residential buildings, 18% incorporate exercise facilities in non-residential buildings, and <4% use skip-stop elevators.

While most respondents (>70%) felt somewhat to very confident in their ability to address environmental conditions such as energy practices and air quality, <30% felt somewhat to very confident in their ability to address chronic diseases such as heart disease or diabetes through building design. Only 45% incorporated design elements for the purpose of increasing physical activity compared to the vast majority who consciously incorporated universal design principles (95%) and elements for improved air quality (84%).

Conclusions:
Baseline survey results suggest many architects currently focus on energy efficiency and environmental concerns but not on physical activity-promoting design. Since the majority report using Guidelines to acquire new information, an intervention such as the NYC Active Design Guidelines could have an important impact on the design of buildings in NYC. A key next step will be Continuing Education seminars on the Guidelines and website dissemination. Since the majority of respondents also developed projects based on LEED, creation of incentives such as LEED credits for physical activity could also help to encourage use of the Active Design Guideline strategies.

Support:
Support for evaluation of the Active Design Guidelines is being provided by the Robert Wood Johnson Foundation's Active Living Research Program.

25) At Odds: Why Odds Ratios in Active Living Research Raise Concerns and What to Do about Them

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Background:
The relevance of social and built environments to physical activity is supported by published research and is the topic of ongoing investigation. This "active living research" has been featured in the media and has played a role in policy discussions. The prominence of active living research in public forums makes the accessibility of research findings crucial. However, the interpretation and communication of active living research findings may be unnecessarily hindered by over-use of logistic regression and the corresponding summary statistic, the odds ratio.

Objectives:
We sought (1) to describe the conditions in which odds ratios can hinder the progress of active living research, and (2) to recommend alternative analysis and data presentation strategies.

Methods:
In our argument we draw on statistical principles, data analysis experience and the published literature to provide Illustrative examples addressing our objectives.

Results:
We identified three key issues raised by the use of odds ratios in active living research, and mention briefly our recommendations to address each of these issues. The first problem is that logistic regression in active living research frequently involves dichotomizing continuous outcome measures such as physical activity or body mass index. Dichotomization discards relevant information and reduces the statistical power of the study. Power loss depends on other study characteristics, though typically a 50% or greater increase in the sample size is required to compensate for the loss of statistical power from dichotomization. Dichotomizing continuous measures also amplifies measurement error problems. Finally, dichotomization is theoretically problematic in a field focused on the often subtle effect of environmental influences on behavior; the environmental characteristics of interest are not necessarily sufficient to push every individual past a set threshold, but these characteristics nonetheless gain attention for their potential to generate incremental behavioral and health improvements for an entire population. Our recommendation is to use statistical approaches that take full advantage of collected data, such as linear models, proportional hazards models, or variations of these.

A second concern is that odds ratios are difficult to interpret and are hard to communicate when used in studies with common outcomes such as sedentary behavior patterns or obesity. When a dichotomous outcome must be used, probability ratios are more intuitive to understand and should be used as the basis for understanding public health issues and planning interventions. Odds ratios approximate probability ratios in cross-sectional or cohort studies when the disease is rare; "rare" defined as affecting <5% of the unexposed population. However, odds ratios are systematically higher (further from the null) than the corresponding probability ratios as the outcome of interest becomes more prevalent. We estimate that for outcomes of interest to active living research, such as sedentary behavior or obesity which affect perhaps a third to half of adults, and the magnitudes of associations common to the field, odds ratios can be expected to over estimate underlying probability ratios by 50% to 100%. The magnitude of an association may become particularly important when research is used to assess attributable risk, drive cost benefit analyses, or shape policy goals.

Even research that overcomes the difficult question of establishing causality can lead to disappointment if the magnitude of the association is misinterpreted. A built environment change to address sedentary behavior might have an unrealistic anticipated benefit based on the use of an odds ratio in place of a probability ratio, leading to poor evaluation of the policy and to doubts about the original research. We recommended that probability ratios (a.k.a. risk ratios or prevalence ratios) be used in place of odds ratios when working with a common dichotomous outcome. Regression approaches that yield probability ratios can be implemented in most standard statistical packages, but when this is not feasible the probability ratios can be estimated and the prevalence of the outcome across exposure groups should be documented.

A third concern is that odds ratios can lead to incorrect conclusions during tests of interactions. Since the correspondence between the odds ratio and probability ratio depends on how common the outcome is, one can have an interaction of odds ratios that does not correspond to a probability ratio interaction, and vice versa. A higher odds ratio in a particular subgroup might be observed simply because the outcome is common in one subgroup and not the other. In addition to the above recommendations, which should be given strong consideration when assessing interactions, we recommend showing outcome prevalence by subgroup with interactions analyses.

Conclusions:
Odds ratios should be viewed critically, and replaced when feasible. When odds ratios must be used, presentation can be improved to facilitate interpretation. Guidance and best practices for estimating probability ratios in Active Living research will be presented, as will approaches to understanding the magnitude of the bias caused by the use of odds ratios.

Support:
Robert Wood Johnson Foundation Health and Society Scholars Program and National Institute of Environmental Health Sciences

26) Engaging Park Directors to Create Active Living Environments

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Background:
Parks and recreation centers are important community resources for moderate to vigorous physical activity (MVPA) as they provide access to multi-use green space and a wide range of organized programs. However, our research suggests that public parks are underutilized, the majority of current park users are sedentary and do not participate in park programs that encourage physical activity. There is currently no standardized method of promoting physical activity in parks, but to develop one it is important to understand park management practices and how management influences and responds to the multiple factors that affect physical activity in parks.

Park and recreation center staff are responsible for the programs at their facilities as well as the image and position their park holds in the community. Park directors in particular influence many aspects of the social environment in parks, including how visitors are treated, what rules are enforced, and what information is made available. Because each of these public parks serves 30,000-120,000 people in a one-mile radius, the impact a park director can have on community health can be significant.

Objectives:
The purpose of this paper is to explore the role of park directors in promoting park programming, community collaborations, and community physical activity in a diverse set of neighborhoods across a large metropolitan area. These local “experts” can inform as well as implement interventions designed to increase physical activity at parks.

Methods:
As part of a larger study that engages parks to find ways to increase park usage and physical activity across diverse neighborhoods of a large metropolitan area, we conducted in-person semi-structured interviews with park directors (n=51) at baseline. Interviews lasted on average 45 minutes and included the directors’ perspectives of their roles, what makes for a successful park, what parks can do to increase physical activity, and the greatest barriers to promoting physical activity in the park, as well as how the directors make decisions regarding programming and community collaborations, and issues regarding park operations (funding, staffing, outreach and marketing, demand for park activities). Additionally, the directors completed an electronic questionnaire that supplied demographic information (age, gender, race and ethnicity), education and relevant training, and length of experience with the Department of Recreation and Parks.

Results:
Of the 51 park directors, 25% were Latino, 39% African American, 37% White, 8% Asian or Pacific Islander, and 6% other race, generally representing the diversity of Los Angeles, though a director may not reflect the racial or ethnic majority of the community they served. Twenty-eight were male, and 23 were female. Park directors reported a range of educational backgrounds with 24% having completed a graduate degree, 72% Bachelors, and 4% Associates, nearly 40% of which reported majoring in recreation or other health related field.

Most park directors indicated that community input is important to determining what programs a park offers, yet in many cases there is no formal method to actively solicit this information. Most park directors do not live within a mile of the park where they work, but felt that it is important to know the surrounding community and to be familiar with local resources, neighborhood leaders, and challenges such as gang problems. Directors reported that their role has become increasingly administrative (more time spent on paperwork and meetings),

allowing less time for interaction with the community and park users, which they believed was important to support park use.

Most directors report collaboration with local schools, which often consisted of passing out park program flyers to students and less often involved allowing schools to use park facilities. Other commonly mentioned organizations with which these parks collaborate include Neighborhood Councils, Chambers of Commerce, police and fire departments, and multiple sports associations and leagues. However, many of these collaborations are fairly limited.

Marketing was reported as being important to increasing program participation, however, parks have limited resources for marketing, park directors have no special training in marketing their programs, and there is no central marketing program to support their current programming and outreach. In addition to advertising and program promotion, directors most commonly reported walking paths, other structural improvements (increased parking, better lighting, refurbished buildings), and physical activity programs as ways to help increase MVPA in parks.

Conclusions:
Increased marketing of park programs was identified as a specific need by many park directors. When provided with the necessary resources parks can individually promote their unique programs and target their specific user population, while the Department can promote the park system to the general public. As the director's role becomes increasingly administrative, their ability to communicate with the community and effectively respond to their needs and interests may decrease. Parks are an important community resource for creating active living environments, and enhanced collaboration between these entities and other organizations can be an important way to increase community physical activity.

Support:
National Heart Lung and Blood Institute

27) The Impact of Socioeconomic Status and Coordinated School Health Program Participation on Local Wellness Policy Innovativeness in Arkansas

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Background:
Due to the seriousness of long-term consequences, many experts maintain that decreasing childhood obesity is a priority in our fight against the obesity epidemic. The public agrees. Public opinion polls have shown that, although Americans are not generally supportive of government regulation to curb obesity, they consistently affirm that childhood obesity legislation is an exception. To date, all 50 states have passed some form of school-based obesity-prevention legislation. Arkansas is recognized as a pioneer in childhood obesity prevention policy. In 2003, Arkansas was the first state to enact body mass index (BMI) legislation, via *AR Act 1220* that required measurement and confidential reporting of BMI information to parents of public school children. The following year, President Bush signed the *Child Nutrition and WIC Reauthorization Act of 2004* (CNWRA) into law. The Act expands the availability of nutritious meals and snacks to school children and improves the quality of food in schools by requiring school districts develop and implement Local Wellness Policies (LWP) for students and staff. Although commendable, such requirements can be taxing on local school districts, especially in poor districts that are often already struggling to meet education mandates such as No Child Left Behind (NCLB). However, funding from The Coordinated School Health Program (CSHP) has allowed many districts in Arkansas the opportunity to implement innovative policies and programs that would not otherwise be possible.

Objectives:
The objective of this study is to compare the innovativeness (defined as comprehensiveness and strength) of LWPs in low-socioeconomic (SES) school districts versus more affluent districts with and without CSHP funding. It is hypothesized that (1) Wellness Policies in districts of low SES will be less innovative than policies in more affluent school districts except when low-SES districts participate in the Coordinated School Health Program and that (2) When funded by CSHP, low-SES districts have a greater increase in LWP score than more affluent districts participating in CSHP.

Methods:
All non-charter, traditional school districts in Arkansas (n=245) were contacted to obtain copies of district Wellness Policies. Wellness Policies were evaluated using the Robert Wood Johnson/University of Chicago, Illinois LWP coding tool. The tool scores LWPs based on comprehensiveness (inclusion of policy components) and strength (conclusiveness of policy language) in seven sections that correspond to CNWRA policy components.

Comprehensiveness and strength scores from each section are combined to produce an overall LWP score. At the time of this abstract, all school districts had been contacted and 88 district policies had been received. It is expected that more conclusive results will be made as more policies are received and analyzed. Final data analysis will include bivariate and multivariate regression to examine district SES and CSHP participation as predictors of LWP score given other district characteristics. Results described here are based on a feasibility study conducted in July 2009 using LWPs from 12 Arkansas school districts that had already submitted plans.

Results:
In July 2009, an initial feasibility study was conducted that examined innovativeness of LWPs by markers for poverty and participation in CSHP. Twelve LWPs were obtained from 6 low-SES districts (>45% of students on Free or Reduced Lunch) and 6 more affluent districts (0-30% of students on Free or Reduced lunch). Three districts in each SES category were grantees in the Coordinated School Health Program. The feasibility study results indicated that CSHP districts outscored non-CSHP districts by roughly 15 points (57 vs. 42.33) and that wealthier districts outscored low-SES districts by an average of four points (47.67 vs. 51.67). However, low-SES districts receiving CSHP funding had a more pronounced increase in LWP score (+20.67 points) compared to wealthier districts participating in CSHP (+8.67 points). Overall, poor districts receiving CSHP funds scored highest with an average score of 58 and non-CSHP poor schools scored the lowest with an average score of 37.33. Based on preliminary results, it appears that wealthier districts are more likely to have comprehensive Wellness Policies than poor districts. However, when poor districts participate in the CSHP, a greater increase in overall LWP score is achieved.

Conclusions:
Data collection and analysis from the remaining 233 school districts will be completed by December 2009. The final results will provide new insight into (1) the unique differences between LWPs in poor versus non-poor districts and (2) other district characteristics that may contribute to the innovativeness of LWPs. Based on data from Connecticut's School Wellness Policy Report and preliminary results discussed above, it is expected that (1) LWPs from low-SES districts will have lower scores than more affluent districts when neither participate in CSHP, that (2) CSHP districts will score higher than non-CSHP districts and that (3) CSHP funding will have a greater impact on LWP score in low-SES districts than in wealthier districts.

Support:
Research conducted at University of Arkansas for dissertation and partially funded by University of Kentucky Public Health Systems Research dissertation mini-grant

28) Parent, Psycho-social, and Household Factors Associated with Urban Children's Active Commuting to School

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Background:
Active commuting to school (ACS), i.e. walking or cycling to school, has been proposed as a method to increase physical activity. Few studies have examined children's ACS using the framework of behavior change theory. This study used social cognitive theory as the framework.

Objectives:
To examine the relationship between ACS and (1) children's self-efficacy for ACS and (2) parents' self-efficacy and outcome expectations for allowing their child to use ACS.

Methods:
A cross-sectional analysis of baseline measurements from a sample of participants (n=133) aged 8-11 years and one of their parents or guardians from an ongoing walk to school intervention study in Houston, TX. The dependent variable of ACS was assessed each day for 5-days by a previously validated questionnaire. Child self-efficacy (alpha=0.75), parent self-efficacy (alpha=0.88), and parent outcome expectations (alpha=0.78) questionnaires were independent variables, adapted from previously validated surveys for physical activity. Child age, gender, race/ethnicity, BMI percentile, and household income were independent socio-demographic variables. The bivariate relationships between ACS with parent self-efficacy, parent outcome expectations, child self-efficacy, household income, and child characteristics (age, gender, race/ethnicity, BMI percentile) were assessed with analyses of variance and chi-square tests of independence. A stepwise logistic regression model was used to assess the relationships simultaneously.

Results:
Results from the bivariate relationships indicated that ACS was significantly associated with household income (p=0.001), parent self-efficacy (p=0.010), parent outcome expectations (p=0.014), and child's age (p=0.028). Results from the stepwise logistic regression model yielded a model explaining 17.5% of the variance and exhibiting good fit (X^2_{HL}=12.29, df=8, p=0.139). In the model, parent self-efficacy (p=.044) and household income (p=0.033) were retained. For each unit increase in parent self-efficacy, the children were over two times more likely (OR=2.4, 95%CI=1.0, 5.5) to use ACS. Children from homes with an annual income of $\leq$\$30,000 per year were over four times more likely (OR=4.3; 95%CI=1.6, 11.3) to use ACS. Conclusions: Greater parent self-efficacy and lower household income were associated with greater children's ACS. Programs to improve parent self-efficacy and more walk to school programs, specifically designed for different socio-economic status families are warranted.

Support:
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29) Using Research to Influence the Built Environment: Engaging Community Leaders to Promote Healthy Lifestyles

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Background:
Childhood obesity has become a national epidemic. It also affects every community in Delaware. Approximately 37% of Delaware's children have a body mass index (BMI) at or above the 85th percentile, making them overweight or obese. In addition, nearly two-thirds of adults in Delaware are overweight or obese.

Nemours Health and Prevention Services (NHPS) is collaborating with the state Divisions of Parks and Recreation (DPR) and Public Health (DPH) to leverage local data and the research evidence base to advocate for built environment improvements that support healthy lifestyle behaviors.

Objectives:
The study's objective is to evaluate the impact of the collaborative strategy to leverage data and research to influence (1) land use patterns at the county, municipal and neighborhood levels; and (2) funding and resources for active recreation statewide.

Methods:
We utilized qualitative methods to assess the impact of efforts to influence land use patterns:

- Study 1. The impact of NHPS' participation in the update of Kent County's comprehensive plan was evaluated through document review.
- Study 2. The impact of the NHPS-DPH collaboration on recommendations for promoting healthy eating and physical activity through the Preliminary Land Use Service (PLUS) process is evaluated through: (1) key informant interviews (planned for October 2009); (2) document review of final PLUS recommendations sent to developers (pre-post); and (3) document review of responses from developers and land use planners (pre-post).

The NHPS-DPR collaboration to leverage data from the Delaware Outdoor Recreation Trends and Patterns Survey (ORTPS) to influence resources for active recreation sites statewide is currently underway and outcomes have not yet been evaluated. The final product will be a policy brief highlighting 2008 ORTPS data that will serve as an advocacy tool parks and recreation community supporters and stakeholders can use to advocate for allocation of resources for active recreation facilities. Accompanying the brief will be customized inserts for five targeted municipalities with data on their residents' recreational usage and preferences.
The project's formative research entails focus groups with stakeholders (parks directors) to determine the content and format of the policy brief and inserts. A process evaluation will capture use of and contexts in which the brief is used (e.g., hearings, funding applications, proposals). A mixed method evaluation of the outcomes of the initiative will be undertaken in mid-2010 to determine the utility and effectiveness of the brief and inserts. This will include: key informant interviews with stakeholders; survey of stakeholders and decision-makers; and document review capturing the outcome of funding applications and proposals submitted by state, county and municipal parks departments.

Results:
During the public comment period for the 2007 Kent County comprehensive plan update, NHPS submitted a position paper with recommendations for promoting healthy lifestyles, including: more compact, mixed land use; a transportation system supporting walking and biking; locating parks, trails and greenways near neighborhoods; and locating supermarkets and farmers markets in areas offering all residents access to fruits and vegetables. NHPS demonstrated support for plan elements promoting healthy lifestyles through testimony at public hearings. The position paper and testimony cited 2006 Delaware Survey of Children's Health (DSCH) data highlighting the need for built environment improvements in Kent County. The final comprehensive plan approved in October 2008 contained many of NHPS' recommendations.

In 2008 and 2009, NHPS and DPH jointly developed recommendations for 15 large development proposals and 9 municipal comprehensive plans through PLUS, the pre-application and review process for major residential and non-residential subdivisions and county and municipal comprehensive plans in Delaware. The Office of State Planning Coordination incorporates the DPH-NHPS joint recommendations in final feedback sent to developers and planners. Document review demonstrates developers are amending plans to include more active living opportunities based on these recommendations. Examples include:

- Milford Upper Elementary School: designing the school site to promote walking and biking to school;
- Sand Hills Dunes: incorporating sidewalks, crosswalks, bike racks and walking/biking trails; and
- Evans Farm: designating bike paths and open space for a potential farmer's market.

The NHPS-DPR partnership has resulted in incorporation of DSCH data and the research evidence base in the 2008-2010 Statewide Comprehensive Outdoor Recreation Plan, a state policy plan that directs future investments in outdoor recreation statewide. Promotion of healthy lifestyles among state residents now will be factored into the decision-making process.

Conclusions:
NHPS collaboration with non-traditional partners like DPR has resulted in the inclusion of data and research on the health benefits of active living in the document governing outdoor recreation funding. Preliminary study findings underscore the effectiveness of using local data and the research evidence base to advocate for built environment improvements as part of the land use planning process. As a result of recommendations from NHPS and DPH, the 2007 Kent County comprehensive plan and several large subdivision and school development proposals now contain provisions promoting healthy eating and active living.

30) Evaluation of a Community-Wide Initiative to Promote Physical Activity Breaks

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Background:
Regular physical activity (PA) is recommended for improvement of overall health and to facilitate weight control. PA has also been shown to foster optimal, physical, and cognitive growth and development in children and adolescents (youth). Schools are prime targets for interventions to increase PA among children since 95% of children are enrolled in school, attendance enforcement ensures high levels of exposure, and the organizational infrastructure permits institutionalization. Some states have begun to mandate minimum amounts of PA in which students engage, requiring that schools augment PE to increase PA levels. In North Carolina, a regulatory policy adopted in 2006 by the State Department of Education mandates that schools provide a minimum of 30 minutes of daily PA for children in grades K-8, *over and above PE requirements* (Healthy Active Children Policy, HSP-S-000).

Instant Recess is an innovative, information technology-based solution for incorporating PA into daily activity. Including brief bouts of exercise in the classroom may enhance children's PA and fitness levels and outcomes of importance to educators, such as on-task behavior and decreased disruptiveness and, possibly academic performance, may increase administrative support and sustain teacher adherence. It is a 10-minute, moderate intensity, exercise break that can be easily adapted across settings.

Objectives:
The overall goal was to implement and evaluate the impact of a planned change in policy and to incorporate activity breaks in elementary schools and afterschool sites in Forsyth County, NC.

Methods:
We employed a randomized, controlled design, using delayed implementation as the control condition. We worked with seven local public elementary schools and eight afterschool sites in the Winston-Salem Forsyth County School district to conduct an evaluation and penetration analysis of a new policy designed to increase adherence to the Healthy Active Children Policy. We used cluster randomization and all students in a given site were assigned to the same intervention condition. Schools and afterschool sites were randomized to immediate exercise breaks or delayed implementation.

We provided assistance to teachers and staff in implementing PA breaks during the course of the school day or afterschool programs. After providing this support and training to teachers and staff, we collected baseline data on the measures of interest before the program began. Variables of interest included school attendance, classroom behavior, disciplinary referrals, academic performance, student nurse visits, PA, and feasibility and acceptability of the activity breaks.

At each school and afterschool site, PA level was collected on eight children per classroom over a 32-minute (8 minutes per student) using a modified version of the System for Observing Instructional Fitness Time (SOFIT). Trained data collectors conducted pre and post observations. Three class rooms in each grade level were sampled in elementary schools and the number of students observed in afterschool sites varied due to enrollment. For logistical purposes, data collection in schools was limited to grades three through five.

After baseline data collection, teachers were encouraged to implement the exercise breaks whenever they deemed it to be appropriate within their classrooms. Teachers were asked to complete log sheets to report in the number of 10-minute exercise breaks performed each day and the sheets were collected at the follow-up data collection visit.

In addition to classroom-specific data, school-wide attendance, disciplinary referrals, Body Mass Index (BMI), school nurse visits, academic performance data was also collected. Follow-up data were collected 6 weeks later.

Results:
We successfully enrolled seven elementary schools and eight afterschool programs in the study. Pre-program data were collected on 21-3rd grade, 22-4th grade, and 22-5th, grade classrooms. (n= 516 students total). Data were collected on 148 students in afterschool sites. Students observed were identified as-, 53% male, 38% African-American, 16% Latino, 40% Caucasian, less than 1% were Asian Pacific Islander and Native American. Ten percent were categorized by observers as overweight. At follow-up, a total of 526 students were observed in the schools and after school programs and the demographics included 51% male, 31% African American, 47% Caucasian, 19% Latino, less than 1% Asian Pacific Islander and Native American and 12% were overweight. Data analysis are proceeding pre and post comparisons of attendance, classroom behavior, disciplinary referrals, academic performance, student nurse visits, PA, and feasibility and acceptability of the activity breaks will be made within conditions and across randomization assignment.

Conclusions:
These data suggest that we can successfully enroll elementary schools and afterschool programs into studies to implement changes in PA-policies and can train staff to implement 10-minute exercise breaks. Additional analyses will demonstrate any impact of such policy changes.

Support:
Supported by the Robert Wood Johnson Foundation's Active Living Research Program (Grant # 65776)

31) OPTIONS: Obesity Prevention Teams in Our Neighborhood Schools

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Background:
In 2006 South Carolina's legislature passed the Student Health and Fitness Act making physical education and nutrition as vital for school children as reading or math. In South Carolina, only 60% of children meet recommendations for weekly moderate or vigorous physical activity and 75% watch ≥ 3 hours of television/day. These problems are accentuated in underfunded, predominantly African-American, Title 1 elementary schools where the Student Health and Fitness Act represents an unfunded mandate without resources necessary for compliance. Additionally, it directly competes with other mandates to improve academic performance. As a result >30% of school children within this community are overweight or at risk of becoming overweight. To overcome the social, environmental, and financial obstacles to developing a healthy physical fitness alternative for African-American children in Title 1 Charleston peninsular elementary schools, the OPTIONS program was initiated with the support of a South Carolina DHHS grant.

Objectives:
To improve healthy physical fitness behaviors, physical fitness performance and prevent obesity among children from a socioeconomically disadvantaged African American community attending Title 1 elementary schools.

Methods:
OPTIONS was a prospective intervention involving African-American boys and girls aged 7-12 from three Charleston elementary schools enrolled in an after school and summer community education program called Kaleidoscope; supported by the Charleston County School District and the Parks and Recreation Commission. OPTIONS is a collaboration between health educators from the Medical University and a community group called the DAE Foundation. OPTIONS met twice weekly for two hours during both summer camp (10 weeks) and the 2008-2009 school year. Children alternated between a physical fitness and nutrition education curriculum and basketball skills training offered by the DAE Foundation trainers. The trainers introduced fundamental basketball skills with an emphasis on learning and executing proper techniques in a disciplined environment. The training is directed by Jermel President, a well known former star player at Burke High School and the College of Charleston. The physical fitness education curriculum included muscle group anatomy, exercise physiology, nutrition, motivational tips, relationship between exercise and stress, mood or self confidence, injury prevention, and activities designed to reinforce the educational goals through a game, contest or physical activity. Pre and post intervention testing was performed including clinical measures of obesity (height, weight, BMI %tile, body fat %tile). Physical fitness behaviors were assessed using the Block Kids Physical Activity Screener (Block), and physical performance was assessed with selected Presidential Physical Challenge tests (situps, pushups, shuttle run, and V-sit and reach). Self image was considered using the Harter Self Perception Profile for Children (SPPC). Paired sample comparisons were performed using the Chi-square test and the Students t-test for categorical and continuous variables respectively with calculation of a 95%tile Confidence Intervals.

Results:
182 African-American children participated in OPTIONS (100 M, 82 F). Their mean pre-intervention BMI was 66.4% ± 27.9% and 31.7% had a BMI > 85th %tile. The Block Screener revealed significant post intervention increases in kcals expended/day (321.1 to 434.5 kcal; $p<0.016$), kcals expended in recreation (232.4 to 338.0 kcal; $p <0.011$), minutes of vigorous activity/day (28.1 to 38.9 mins; $p< 0.041$) and a non-significant increase in moderate activity/day (63.7 to 74.7 min; $p<0.224$). All post intervention Presidential Challenge tests

demonstrated significant improvement ($p<0.001$) in performance. Participating children showed significant increases in height (141.5 to 142.8 cm; $p < 0.001$) and weight (41.6 to 42.4 kg; $p=0.001$) but no increase in BMI (20.2 to 20.3; $p=0.632$) or BMI %tile (66.4 to 65.9%; $p=0.578$). The children did have a significant ($p=0.033$) reduction in body fat from 27.9% to 26.7%. The intervention had no impact on the Harter SPPC or its subdomains. The results were consistent across age, gender, and BMI %tile at enrollment.

Conclusions:
This multidisciplinary after school intervention provided both physical fitness education and basketball skills training in a school aged, high-risk African-American community. Pre vs. post-intervention testing revealed significant improvements in physical fitness behaviors and performance which were equally true for both boys and girls, younger (7-9) and older (10-12), and smaller and larger (BMI>85th %tile) children. In this high risk community with almost a third of the children already at risk for obesity, there was no increase in BMI or BMI percent over the course of the intervention. Very promising was a significant 1.3% reduction in body fat %tile and the changes in physical activity behaviors. This academic, community and school partnership helped create a popular and successful physical fitness program available to an urban Title 1 elementary school environment which otherwise lacks time, facilities, instructors, curriculum or funds to implement the physical activity based interventions necessary to combat childhood obesity.

Support:
South Carolina Department of Health and Human Services Prevention Partnership Grant (GAR 06-07 and GAR 07-08)

32) Review of National Legislative and Regulatory Policies for Playground Safety

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Background:
Communities are becoming more aware of the need to enhance healthy lifestyles for youth by offering safe places in neighborhoods for play. Play is essential for children because it not only helps them meet physical activity guidelines, but also contributes to their physical, cognitive, social, and emotional well-being. Several studies have promoted the use of playgrounds as safe places for children to play. However, annually over 200,000 children are treated in United States (U.S.) emergency departments for playground-related injuries. Approximately 76% of these injuries occur on public playgrounds. Severe injuries account for about 44% of all reported playground-equipment related injuries and include fractures, internal injuries, and concussions. The U.S. Consumer Product Safety Commission (CPSC) recommends voluntary safety guidelines for playground equipment and surfacing, as well as recommendations for the layout, installation, and maintenance of playground equipment. American Society for Testing and Materials International (ASTM) also has developed several voluntary industry standards pertaining to the safety of playground equipment and surfacing. Improved regulation of playground equipment has been shown to decrease the risk of playground-related injuries among children. Yet only some states and localities around the country have enacted legislative and regulatory policy that adopts all or parts of the CPSC and ASTM guidelines and standards.

Objectives:
The objectives of this policy research are to document the extent to which policies addressing playground safety adopt the guidelines and recommendations of the CPSC and ASTM; identify gaps and weaknesses in the policies; and recommend policy changes that would provide safe places for children to play.

Methods:
We reviewed existing legislative and regulatory policies in the U.S. that outline safety standards for public playground equipment, including playgrounds in school and child care settings. To identify state level policies, we conducted legal searches using LexisNexis, the National Conference of State Legislatures Health Policy Tracking Service, and examined child care setting licensure regulations available through the National Resource Center for Health and Safety in Child Care. Since no known database exists that captures local policies, we identified localities where playground safety policies were enacted through media searches and discussions with key informants who are active in the field of playground safety standard development.

Results:
Preliminary analysis identified seven states in the U.S. that have enacted policies that regulate the safety of public playgrounds, two states that have regulations pertaining to school playgrounds, and nine states that have regulations for playgrounds in child care settings. We also identified at least two localities that have passed ordinances pertaining to playground safety. An initial review of the policies suggests that the extent to which the state and local policies require safe conditions on the playground varies greatly. For the most part they are weak in their intentions to promote playground safety, adopting only selected components of the available guidelines and standards and excluding provisions for implementation and enforcement. Further analysis will identify additional states and localities that have enacted playground safety regulatory policies, including any recently enacted proposals that are currently moving through the legislative process. Further analysis will also include a standardized rating of the strength of the legislative and regulatory policies.

Conclusions:
A small proportion of states have policies that require minimum safety standards for playgrounds. The scant policy in this area is alarming since children are encouraged to use playgrounds to help meet physical activity guidelines, and to benefit from the positive effects of play on a child's cognitive, social, and emotional development. Furthermore, the lack of language in the policies related to implementation and enforcement is disconcerting. A partnership between those working in physical activity promotion/active living research and public health injury prevention professionals is needed to best promote the development and implementation of adequate, protective policies based on available safety standards that ensure safe places for children to play.

Support:
This work was supported in part by Grant Number 5R49CE3000198 from the Centers for Disease Control and Prevention (CDC).

33) *Monarch In Action (MIA):* Youth Advocate for Improvements to Enhance Walkability in their Neighborhoods

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Background:
The built environment may support or discourage walking. Pedestrian facilities (e.g. sidewalks, crosswalks, curb ramps, etc.) in particular can enhance or reduce the overall walkability of a neighborhood. Many communities have pedestrian facilities that are in poor condition, which may inhibit opportunities for walking and create dangers for pedestrians. Community residents, particularly youth, can be engaged to assess and advocate for improvement of pedestrian facilities through collaboration and civic participation.

Objective:
The purpose of this project is to engage youth in the assessment of and advocacy for pedestrian improvements to enhance opportunities for walking in their neighborhoods.

Methods:
WalkSanDiego, a non-profit organization, focuses on promoting healthy, active environments through policy and built environmental changes in San Diego County. WalkSanDiego, in partnership with Active Living Research, collaborated with the Monarch School for transitional youth to engage a class of 8th graders in the Monarch in Action (MIA) project. WalkSanDiego trained the MIA youth to assess built environment barriers to walking in the neighborhoods surrounding their school and to advocate for improvements to enhance pedestrian facilities through various activities. The MIA project began with presentations on physical activity and walkability. Hands-on learning then occurred outside of the classroom through walk audits of the neighborhoods surrounding the school. During the walk audits, youth had the opportunity to document pedestrian dangers or barriers with note-taking of locations and issues along with photos. With technical assistance from WalkSanDiego, the youth developed recommended solutions for the built environment barriers they identified. They prepared a presentation of this information based on their photo documentation. The youth presented their findings for City staff (i.e. Engineering, Public Works, etc.) to advocate for pedestrian improvements in these neighborhoods. This presentation led to a partnership with City staff to discuss needed pedestrian improvements to address issues the youth identified.

Results:
The youth assessment of the built environment in neighborhoods surrounding the school identified various barriers to walking including: unmaintained sidewalks (e.g. cracked, unlevel, etc.), dangerous crossings (e.g. unmarked crosswalks, speeding traffic, wide intersections, missing pedestrian signal, etc.), inadequate school zone signage, and general maintenance problems (e.g. graffiti, trash, cigarettes, etc.). A post-evaluation will be conducted with the youth to assess their beliefs and skills surrounding walking, assessing walkability, and advocacy, along with any changes that resulted from participation in MIA. Results from this evaluation will be provided as part of the poster presentation.

Conclusions:
This project provides an empirically supported model for engaging youth as agents of change and advocates for built environment improvements. The information presented includes specific strategies to engage youth to assess and advocate for built environmental changes, which is a key aspect for successful multi-generational efforts and partnerships that are needed to bring about lasting change. This partnership can be used as a model of how collaboration can strengthen efforts to improve walkability, leverage resources, and bring support for positive environmental change.

Support:
Kaiser Permanente provided support for WalkSanDiego's role in this project.

34) Neighborhood Bikeability and BMI in NYC

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Background:
It has been theorized that the bikeability and walkability of a neighborhood are important determinants of physical activity, and in turn body size. However, while a growing body of evidence links neighborhood walkability to obesity, the effect of bikeability on obesity has not been as well studied.

Objective:
To determine whether the bikeability of a neighborhood predicts Body Mass Index (BMI) in New York City, before and after controlling for the walkability of a neighborhood.

Methods:
A cross-sectional, multilevel analysis of BMI among 13,088 adult residents of New York City was conducted. We developed measures of neighborhood walkability and bikeability for neighborhoods defined as half-mile buffers around the study subject's home address. Data used to construct the neighborhood level measures came from the 2000 U.S. census, the NYC Department of City Planning and the NY State Department of Transportation. The bike related variables employed in this study were percent of residents who commute to work on a bicycle, percent of streets with bike lanes, density of bike lanes, defined as total length of bike lanes per km^2 of land in a neighborhood, and number of bicyclists injured in a neighborhood per year. Correlations between the four bike related measures were conducted to assess whether they appear to represent the same underlying construct of bikeability. Then associations between BMI and the four measures of neighborhood bikeability were each assessed in separate models, before and after adjustment for measures of walkability. The measures of walkability included in the analysis were population density and commercial-residential land use mix, both which have previously been found to be significantly associated with BMI in this same study population. All analyses controlled for individual level measures of age, sex, race and education and neighborhood level measures of racial composition and poverty.

Results:
The number of injured bicyclists is positively correlated with bike lane density ($r=0.59$, $p<0.01$), percent of residents who are bicycle commuters ($r=0.55$, $p=<0.01$) and percent of streets with bike lanes ($r=0.48$, $p=<0.01$). Our measures of bikeability varied across neighborhoods in New York City. The mean and 10^{th} to 90^{th} percentile for percent of residents who are bicycle commuters was 0.5% (0%, 1.1%), for percent of streets with bike lanes was 4.7% (0%, 14.0%), for density of bike lanes was 0.75 (0.0, 2.3) and for number of bicyclists injured was 14 (0, 32). After controlling for individual and neighborhood sociodemographics, all four measures of bikeability were found to be significantly inversely associated with BMI (see table 1). After further control for population density and land use mix, the percentage of residents who commuted by bike, bike lane density, and the number of bicycle injuries remained significantly inversely associated with BMI.

Conclusions:
Our measures of neighborhood bikeability vary across neighborhoods in New York City and predict BMI in our study subjects. A limitation of this study is that it did not assess whether individuals themselves actually bike, we were only able to measure the association between environmental indicators of bikeability and study subject's BMI. It is likely that the associations between our measures of neighborhood bikeability and BMI represent a correlation between bikeability and other neighborhood design elements that promote physical

activity in general. However, the association appears to be independent of measures of neighborhood walkability. Because the appropriate denominator, number of bicyclists on the road in each neighborhood, was not available, the conceptual meaning of the variable is ambiguous. It is difficult to know if a high number of injuries represents a large number of bicyclists and thus high bikeability, or if it represents an area that is hazardous to bicyclists and thus low bikeability. Given that the number of bicycle injuries is positively correlated with the other measures of bikeability, we interpret the measure as a function of the number of bicyclists. In conclusion, our results show that neighborhood bikeability is inversely associated with BMI, even after control for indices of neighborhood walkability.

Table 1. Associations between indices of neighborhood bikeability and BMI

	Model 1[1]	Model [2]
	Beta (p-value)	
% Bike Commuters	-0.534 (<0.01)	-0.361 (0.01)
% streets with bike lane	-2.134 (0.04)	-1.513 (0.13)
Bike lane density	-0.261 (<0.01)	-0.172 (0.01)
Bike injuries	-0.022 (<0.01)	-0.012 (0.01)

1 adjusted for age, sex, race, education, neighborhood racial/ethnic composition and percent poverty
2 adjusted for covariates in model 1 + population density & land use mix

35) Dissemination of Promising Strategies to Influence Organizational Socio-Cultural Environments to Promote Physical Activity

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Background:
Despite the known benefits of physical activity (PA) many Americans do not get adequate amounts on a regular basis. Organization-level strategies for increasing physical activity have been limited. One strategy that has shown promising results is the *Lift Off!*, which was originally developed to promote increased PA among employees in the Los Angeles County Health Department. Additional studies are needed to disseminate organizational-level strategies for promoting PA.

Objective:
The primary purpose of this study was to disseminate the *Lift Off* concept for use in schools and churches in the South. The project expanded previous efforts to implement *Lift Off* in black churches in this region.

Methods:
The study had a two phase design:

Phase 1 (Months 1 - 3). During Phase 1, we issued a call for proposals for $500 mini-grants for innovative ways to incorporate the Lift Off concept into regularly scheduled organizational activities. Participation was open to all schools and churches in Forsyth County area. Eligibility criteria included: Attend at least one information session to learn about the funding opportunity; be willing to conduct an exercise program for at least six months; be able to recruit and retain a minimum 20 participants in the program; be willing to use the 10-minute exercise break materials within the program; and be willing to allow physical activity data to be collected on participants the program. The goal was to fund 25 organizations to execute the program.

Phase 2 (Months 4 - 12). During Phase 2, *Lift Off* was implemented and the impact of participation on PA levels was evaluated. Organizations were asked to recruit 20 participants per site that met study eligibility criteria: 1) $\geq$ 18 years of age; 2) Willing to participate in an exercise program for at least three months; 3) Participate in data collection before and after the program; 4) Answer no to all questions on the physical activity readiness questionnaire OR obtain physician consent to participate in the program. Participants who did not meet all four of the criteria could not be enrolled. Technical assistance was provided from key program personnel to train organizations on how to implement *Lift Off*.

Organizations conducted their proposed activities for at least 6 months and participated in pre- and post-program evaluation. We used accelerometers to objectively measure physical activity (7 days at each data collection time point). Other measures included the International Physical Activity Questionnaire (IPAQ) and questionnaires measuring exercise self-efficacy and enjoyment. Height, weight, and blood pressure were collected on each participant. Process measures, including satisfaction surveys, were collected from participants at the final data collection visit.

Results:
Phase 1. We conducted three information sessions with 25 participants representing 19 organizations. Twelve of the nineteen organizations ultimately submitted completed applications, which were reviewed by key staff at Wake Forest University and UCLA. Three schools and nine faith-based institutions were funded through the mini-grant program; however, two faith-based institutions did not complete the enrollment process.

Phase 2. There were a total of 199 enrolled participants from the ten organizations that completed the study (mean age 48.1 $\pm$ 13.8 years [range 17 - 86 years], 87% female, 27% white, 72% African-American, mean body mass index [BMI] 31.7 $\pm$ 7.5 kg/m^2 [range 17.7 - 61.2 kg/m^2]). At baseline, participants reported 24.3 $\pm$ 48.7 minutes per week in moderate-intensity PA, 46.8 $\pm$ 68.5 minutes per week in vigorous-intensity PA, and 42.0 $\pm$ 61.8 minutes per week in brisk walking on the IPAQ.

The organizations were creative with their implementation of the *Lift Off* program (e.g., integrated into 6:00 a.m. prayer services, weekly bible study, precursor to family night dinner, warm-up for weekly exercise programs take home workout). Analyses are currently being conducted to describe changes in accelerometer-assessed and self-reported physical activity, BMI, and blood pressure after three months, as well as changes in exercise self-efficacy and enjoyment. Analyses will also describe results from participant satisfaction surveys.

Conclusions:
These data suggest the feasibility and acceptability of the *Lift Off* concept in schools and churches in the south. Participating organizations were able to incorporate the activity breaks into routine activities and showed progress toward increasing PA levels among participants.

Support:
This project was supported by a Transition Supplement grant from the Robert Wood Johnson Foundation's Active Living Research Program.

36) Agreement in Walking Trips and Locations between GPS/Accelerometer Data and a Travel Diary among Adolescent Girls

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Background:
Although a growing body of literature has linked neighborhood characteristics to physical activity, little of this research has objectively examined where the activity occurred. Self-reported travel diaries provide contextual information regarding personal patterns of transportation behavior. Beyond the travel information, they also provide information about where and when activities occur. Despite the popularity of diaries, few studies have examined the validity of these instruments.

Objectives:
To examine agreement between behaviors self-reported in a travel diary and data recorded using passive, portable accelerometer and GPS units. We measured agreement in the number of walking trips and agreement between the self-reported locations visited and those recorded by the GPS units.

Methods:
The Trial of Activity of Adolescent Girls-2 (TAAG2) Study is a longitudinal observational study of physical activity and nutrition behaviors of adolescent girls in San Diego, CA and Minneapolis/St. Paul, MN. A convenience sample of high school aged girls were recruited (N=51; 26 participants in CA and 25 participants in MN) in 2007. Approximately half of the participants were in the 10th grade and half in the 11th grade.

Participants wore a) off-the-shelf Foretrex 201 portable GPS units (Garmin Ltd., Olathe, KS) 7, and b) an accelerometer, the dual mode ActiGraph model 7164 (Manufacturing Technology Inc., Pensacola, FL). Participants also filled out the neighborhood places log, a diary in which they recorded either on a PDA or by hand information about every place they travel to during the day including their travel mode (e.g., walk/run, city bus, school bus, driven by someone else), who they traveled with, times of arrival to and departure from destination, the name of the destination, its address, number of people they were with at the destination, and the physical activity undertaken at the destination (sedentary, walking, very active). The diary also included information about food intake and expenses while at the destination.

To examine agreement among methods in detecting walking trips, we first identified the methodology for extracting walking trips from the accelerometer and GPS data. We randomly divided the sample into a 'calibration' or training group and a 'validation' group. Data from the calibration group were used to test 48 different algorithms. Consistent with the literature, we used accelerometer data (count thresholds and bout lengths) and GPS data (minimum dwell times and speed ranges) to identify walking activity. Agreement in the number of trips per day identified with the two methods was determined using a concordance correlation coefficient and interpreted according to Landis and Koch's criteria.

To achieve our second aim of examining agreement regarding the locations visited by walking, conditional on having been matched by the methods, we imported the GPS data of all walking trips to ArcMap 8.3 (ESRI, Redlands, CA). A 0.4 km (1/2 mi) circle around the last GPS data point for each walking trip was drawn and all street names of streets fully or partially contained in the circle identified using ESRI Streetmap in

ArcCatalog (ESRI, Redlands, CA). Agreement was achieved when the street address of each destination reported in the diary was also found in the GIS street addresses in the circle drawn.

Results:
A total of 181 participant-days were included for analysis. Participants reported an average of 0.54 walking trips per day. At the extremes, no walking trips were reported over 122 person-days (67.4%) and 4 walking trips were reported over 2 person-days (1.1%). Participants assigned to the 'calibration group' had 92 participant-days of data, while participants in the 'validation group' had 89 person-days of data. In the calibration sample, agreement statistics (concordance coefficient) in the number of trips ranged from 0.58 and 0.89 depending on the algorithm used to identify walking trips from the GPS/accelerometer combination. In the validation sample, the concordance statistic ranged from 0.52 and 0.70, indicating moderate to adequate agreement. When examining the reported locations of walking trips, conditional on self-reporting the trip in the diary and identifying it with the GPS/accelerometer combination, 90% of locations were successfully matched to within 0.4 km of the last GPS point for the trip.

Conclusions:
We ascertained moderate to adequate agreement between the number of walking trips and their location, concurrently self-reported in the neighborhood places log and identified through passive, portable GPS/accelerometer units. This suggests that use of these methods for understanding the influence of contextual factors on behavior is promising and should be pursued with larger samples. This is the first study to examine the validity of self-reported diaries that include pedestrian activity.

Support:
NHLBI # R01HL71244

37) Dog Walking Among Youth: Relationships with Physical Activity, BMI, and Built Environment

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Background:
Research among adults suggests that dog owners who walk their dog are more physically active than non-owners and dog owners who do not walk their dogs. However, most studies note that at least half of dog owners spend no time walking their dogs. Some studies suggest that dog owners are more likely to walk their dog when they live in more walkable communities. Only one known published study has examined dog walking among children and found overweight and obesity rates that were lower for 5-6 year old children who owned a dog while there was no relationship among 10-12 year olds. Dog walking could be a strategy for increasing physical activity among children in the midst of a childhood obesity epidemic.

Objectives:
This study examined BMI, physical activity, and environmental correlates of dog ownership and dog walking among children and adolescents.

Methods:
Participants were 287 parents (M age = 42.7; 75% female; 72.1% white) of youth between 5 and 18 years of age (M age = 12.04; 52.6% female). Parents completed surveys on behalf of their child. To assess dog walking, parents were asked whether the family owned a dog and, if so, how many minutes over the past week their child walked the dog. Parent-reported outcomes included child sedentary behavior time, child days per week physically active for 60 minutes or more, child height and weight (used to compute BMI z-scores). The Neighborhood Environment Walkability Scale for Youth assessed perceived land use mix-diversity, pedestrian and automobile traffic safety, crime safety, aesthetics, walking and cycling facilities, street connectivity, land use mix-access, residential density, and recreation facilities. Analysis of Covariance models compared dog owners vs non-owners and dog owners who walked their dog vs those who did not. Parent ethnicity (as a proxy for child ethnicity which was not assessed), household income (above or below $50,000), and child gender were covariates in all models. Separate models were run for children (n = 116; ages 5-11) and adolescents (n = 171; ages 12-18).

Results:
The test-retest reliability of reporting dog ownership was high (Kappa = .94) while it was lower for reporting minutes spent walking the dog (ICC = .47). Among the total sample, 43.4% reported owning a dog.

Among children, comparing dog owners to non-owners, dog owners had lower BMI z-scores (Adj M owners = .20; Adj M non-owners = .86, p = .005), higher total sedentary time (Adj M owners = 143.0 hours/week; Adj M non-owners = 125.7; p = .04), and non-significantly more days being physically active (Adj M owners = 5.04 vs. Adj M non-owners = 4.42, p = .075). Dog ownership did not vary by any demographic variables.

Among adolescents, there were no relationships with outcomes by dog ownership. However, those from households earning more than $50,000 per year were more likely to own a dog (70.1% of dog owners were from high income households; Chi Square = 4.1, p = .04) and adolescents with a white parent were more likely to own a dog (79.2% of owners had a white parent).

Among only dog-owners, 45.3% of children and 50.0% of adolescents reported never walking their dog in the past week. Children who walked their dog had higher BMI z-scores than those who did not (Adj M walker = .54; Adj M non-walker = -.19; p = .03). There were no differences for physically active days or sedentary behavior for either age group comparing dog walkers to non-walkers. Among adolescents, those from lower income households spent more time walking the dog (Adj M low income = 70.97, Adj M high income = 30.00 minutes/week, p = .006). There were no other demographic differences for children or adolescents. The only neighborhood environment scale significantly associated with dog walking was crime safety. Children who walked their dog had significantly higher ratings of safety (Adj M = 2.63) than those who did not (Adj M = 2.08; p = .03).

Conclusions:
Dog walking was not associated with time spent being physical active or sedentary in youth. Unexpectedly, children who walked their dog had higher BMI z-scores than those who owned but did not walk their dog. The only environmental variable associated with dog walking was crime safety in which children living in safer areas spent more time walking the dog. However, lower income adolescents walked their dog twice as much as those living in higher income homes. The results of the study indicate that dog walking may have fewer health benefits, particularly regarding weight status and activity levels, for children and adolescents compared to adults. Prospective studies are needed to confirm results and further explore dog walking among youth.

Support:
Robert Wood Johnson Foundation

38) Comparing Momentary Direct Observation with Self-Report of Park-Based Physical Activity Levels

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Background:
There is increasing interest in measuring physical activity (PA) within parks to determine the contribution of the environment to PA. However, there is no universally accepted protocol for measuring park-based physical activity (PBPA) at the individual level. Observational methods such as SOPARC have been developed to measure aggregated PBPA at the level of the park or area; at the same time, measures of self-reported PBPA are often used at the individual level. Researchers are also developing ways to adapt observational methods to measure individual-level PBPA, but little work has been done to establish correspondence between the methods.

Objectives:
To determine how self-reported PBPA levels correspond to a momentary direct observation method derived from established techniques.

Methods:
Self-reported and momentary directly-observed data on PBPA were obtained from 237 adults interviewed in New Orleans parks during summer 2008. The self-report data consists of questions about respondents' current PBPA and include: 1) "How many total minutes do you plan to spend in the park today?" 2) "Which of the following best describes your level of activity at this park today: sedentary, moderate, or vigorous?" Sedentary was defined as "lying down, sitting, or standing in place," moderate was defined as "walking at a casual pace," and vigorous was defined as "more effort than a casual walk, having an increased heart rate causing you to sweat, such as jogging, walking at a vigorous pace, swinging, doing cartwheels." 3) "What activities are you doing at the park today?" Respondents were also asked to self-report their race and age.

The momentary directly-observed data came from observations made by the interviewers about each subject interviewed. Interviewers were extensively trained in SOPARC techniques. Before approaching a subject, interviewers noted whether their physical activity level at that moment was sedentary, moderate, or vigorous. Definitions of physical activity levels came from SOPARC methodology and were the same definitions provided to survey respondents. Interviewers also noted the subject's gender and type of activity engaged in at that moment, using a predetermined list of codes.

Results:
237 respondents were observed and interviewed. 52% were female, 53% African American, mean age was 36.3 years (SD 11.1). Respondents planned to spend an average of 94 minutes in the park (SD 94.2), and 61.2% reported engaging in moderate-to-vigorous PA. Agreement between PBPA categories (sedentary vs. moderate-vigorous) was low (kappa=0.26, 61% agreement). Nearly one-third of respondents (29.4%) "over-reported" their PBPA compared to the interviewer's observation, while 9.1% "under-reported." Bivariate associations revealed that African Americans and those who planned to spend more time in the park were significantly more likely to over-report their PBPA, while those who were walking their dog were more likely to under-report. Logistic regression results (Table) predicting "over-reporting" compared to "under-reporting/agreement" with observed PBPA showed that respondents who were African American, planned to spend more than an hour in the park, and who reported playing with children were over twice as likely to over-report their PBPA relative to the observation.

Conclusions:
Agreement between self-reported and momentary directly-observed PBPA was low. Our results show that time spent in the park, type of activity, and race influence how respondents rate their own activity level. Respondents who planned to spend a longer amount of time in the park, reported playing with children, and who were African American were more likely to self-report their activity level as being higher than what the interviewer observed. Activities that incorporate varying levels of physical activity and long duration, participation in which may also differ by race, are more difficult to capture accurately with a momentary directly-observed measure.

Support:
This research was supported by Cooperative Agreement Number 5K01DP000088 from the CDC.

Table. Predicting Over-Reporting (vs. Under-Reporting/ Agreement) of PBPA by Park Visitors Compared to Momentary Directly-Observed PBPA

		95% CI		
	OR	lower	upper	P-val
Female	1.11	0.58	2.14	0.753
Age	0.99	0.97	1.02	0.707
African American	2.25	1.04	4.88	0.040
Over 1 hour in park	2.40	1.16	4.93	0.018
Walking the dog	1.21	0.45	3.31	0.705
Playing with children	2.75	1.13	6.65	0.025
Playing team sport	1.36	0.57	3.27	0.489

39) Using Electronic Health Record Data for Large Scale Studies of Pediatric Obesity and the Built Environment in Urban and Rural Settings

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Background:
Since the 1980s, the prevalence of obesity in children has increased dramatically, a factor that will continue to propagate the adult epidemic. The prevalence and severity of obesity is greater in rural than in urban areas, and importantly, local considerations are likely to be essential to development of effective interventions. In Pennsylvania, the prevalence of childhood obesity is high, especially in the central and northeastern regions of the state. Moreover, in the past three decades, Pennsylvania has been among the worst states in the degree to which land use growth has outpaced population growth, offering a unique opportunity to understand relations among aspects of the built environment (BE) and social environment (SE) and changes in body mass index (BMI) in the first two decades of life.

Objectives:
To evaluate associations of 9 metrics of the BE with BMI among children and adolescent primary care patients of a large, integrated health care provider in 31 counties of Pennsylvania, and to determine how age and two metrics of the SE modify the relations between the BE metrics and BMI.

Methods:
Data for this study were obtained from Geisinger's electronic health record (EHR) used in 41 community practice sites. The study population was restricted to primary care patients 5 to 18 years of age who were residing in our 31-county catchment area. Data extracted from the EHR included height and weigh measured during each visit, demographics, addresses, and diagnoses. Each patient address was geocoded into a unique definition of place, the smallest of townships, boroughs, and census tracts (the first two are part of the minor civil division [MCD]; the third MCD is city, deemed to be too large to define neighborhoods, and thus CT was used). Analysis was restricted to places with at least 15 patients each. This resulted in a total of 45,892 patients in 479 non-overlapping places, including 363 townships and boroughs and 116 census tracts). We used census and a variety of geocoded data to derive measures of the local physical activity environment (LPAE), land use environment (LUE), local food environment (LFE), and SE. After data reduction, we evaluated in regression models a set of 4 LUE measures (population density, road density, average block size, land use mix), 4 LPAOE measures (density of total number of physical activity relevant places, hiking trail length density, conservation park project density, and diversity of physical activity establishments), 3 LFE measures (density of fast food restaurants, supermarkets, and convenience stores), and 2 SE measures (community socioeconomic deprivation based on 6 census measures and social disorganization based on 5 census measures) that were orthogonal within environmental categories and had favorable distributions (i.e., few places with missing data, reasonable range across places). The resulting measures were considered for inclusion in a multi-level statistical model where the dependent variable was BMI percentile (cross sectional and longitudinal), independent variables were included for level I (such as subject age, gender, and co-morbidities) and for level II (i.e., type of place defined by MCD or CT, BE metrics, and SE metrics).

Results:
The mean age of the study population was 10.9 years, 51% were male and 91% were White/Caucasian. Of the total number of children, 9361 (20%) were obese (BMI percentile > 95%) and another 7748 (17%) were overweight (85% < BMI percentile < 95%). The BE and SE items were included in separate cross-sectional multi-level regression models for associations with BMI percentile (using the most recent BMI measure for each subject) after controlling for age, gender, co-morbidity status, frequency of office visits, and type of place (i.e. MCD or CT). In preliminary analyses, higher population density was strongly and directly associated with higher BMI percentile and was retained in each subsequent multi-level model. After controlling for population density, the following other place-level items were associated with higher BMI percentile: fewer types of LPAOE establishments, higher road density, lower diversity of land use, and higher community socioeconomic deprivation. Additional analysis will be completed to model cross-sectional and longitudinal relations of BMI with the LUE, LPAOE, and LFE metrics and to evaluate whether these associations are modified by age, sex, place type, or place-level SE.

Conclusions:
We anticipate that these analyses will be completed well in advance of the February 2010 meeting because we need these results to select communities for our Phase II study. The results will be unique to our knowledge, offering an evaluation of urban and rural areas, effect modification by age on LUE, LFE, and LPAOE relations across a wide range of ages, and effect modification by SE on BE relations.

Support:
This research was supported by a grant from the Robert Wood Johnson Foundation's Active Living Research Program.

40) Eating Smart Moving More in Walterboro South Carolina

Amy Splittgerber, M.Ed.[1], Cathleen Jernigan, M.Ed.[1], Marilyn Peters, M.Ed.[2], Terry Bazzarre, PhD[1]

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Background:
The mission of Eat Smart Move More South Carolina (ESMMSC) is to coordinate collaborative and sustainable efforts to support healthy eating and active living where South Carolinians live, learn, work and play. ESMMSC is the lead agency for implementing the state's obesity plan working with policy makers, public and private organizations and individuals. SC is one of the unhealthiest states in the U.S. ranking 46th. Physical inactivity costs SC $4,653,914 annually and more than $1 billion is spent on obesity-related medical costs. Seventy-five percent of children are obese or overweight. In 2004, SC had the 4th highest obesity rate of the 50 states.

Objectives:
The objective of this project was to create an effective community model for change by testing the effectiveness of the ESMMSC strategic framework for action, toolkits and other resources in one community in the state, and to disseminate this model so other communities can lower obesity rates by promoting environmental and policy solutions for healthy eating and active living. This three year case study represents the translation of research into practice in Walterboro, SC - a community of about 5500 residents. Half of Walterboro residents are African American, 22 percent of the total population and 37 percent of children under age 18 live below the poverty line.

Methods:
The first phase of this project was to assist local stakeholders in conducting a community assessment and developing a 3-4 year action plan for reducing obesity. The community assessment included key informant interviews, a community survey, GIS mapping of community assets and barriers for promoting healthy eating and active living, and the RALA (Rural Active Living Assessment developed by ALR). A SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis was conducted to identify internal and external factors that may impact short and long-term success, and the results can guide solutions for mitigating barriers stakeholders may face in implementing the plan.

Results:
Key informant interviews included representatives from the school district, faith-based groups, worksites, healthcare and the community at large. Half of informants did not think Walterboro was a healthy community because of the need to strengthen and expand elements of the built environment such as sidewalks, bike lanes, parks and lighting combined with the need to strengthen the new farmers' market and increase access and affordability of healthy foods.

Barriers to change included the lack of resources, poverty, current attitudes, beliefs and (unhealthy) habits combined with the need for education and healthy alternatives for nutrition and physical activity. Almost one-tenth of residents responded to the community survey in a three week period (n=482). In comparison to 2004 Census data, survey respondents were more likely to be female (77 vs. 56%), White (69 vs. 50%) and more than 45 years of age (56 vs. 25%). When asked where they receive health information, 50-60 percent of respondents cited billboards, newspaper articles, radio and TV; 71 and 48 percent received health information at work and church, respectively.

Barriers to physical activity included cost (44%), lack of facilities (42%), lack of time (39%), don't want to go alone (38%) and weather (36%). In comparison to physical activity, barriers to purchasing healthy foods included cost (65%), lack of time (38%), limited access (19%), and "don't know how to prepare healthy foods" (13%). Almost 20% of respondents said they received health information at work while 50% received no incentives or information. Eighty-five percent of respondents felt that government funds should be spent to build and maintain places where people could be active. An indoor swimming pool (56%) and a walking trail (51%) were recommended by respondents to help increase opportunities for physical activity while 49% thought that stores like "Fresh Market" and "Whole Foods" - as well as restaurants that provided healthy options would increase access to healthy foods.

The RALA tool was used to assess 21 zones: 11 zones were rated as walkable and 9 zones had positive aesthetics. The zones with the highest ratings for walkability and aesthetics were randomly distributed suggesting the need to develop a long-term development plan for linking contiguous zones so that people can use active transportation from one neighborhood to the next. More than 100 locations were identified with GIS mapping in this small community. Most of the 37 restaurants and grocery stores are located on one of two main roads. Most neighborhoods have a small park, but many are not always viewed as safe. The Great Swamp Sanctuary was viewed as a major resource for promoting biking and walking for all members of the community.

Conclusions:
Stakeholders and ESMMSC staff successfully completed the community assessment that is informing the action plan that will be completed by August 2009. Barriers and opportunities were similar across the four assessment components.

Support:
ESMMSC received support through a cooperative agreement (U58/CCU422822) with the Centers for Disease Control and Prevention, Division of Nutrition, Physical Activity and Obesity.

41) Socioeconomic and Racial-Ethnic Inequalities in Public Park Access and Air Pollution Exposure

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Background:
Public parks and green spaces play a decisive role in defining ecological and social functions of urban environments. Regular physical activity, with its attendant health benefits, is associated with access to parks and open space. Past research in several urban locales has demonstrated patterns of environmental inequity in the distribution of parks and open space, while related research suggests that the quality of available parklands and associated recreational facilities and programs also disadvantages poor neighborhoods and communities of color. At the same time, a substantial number of studies reveal that such communities also suffer from disproportionate exposure to traffic-related pollution. There are no studies, however, that consider whether residents of these communities are able to escape pollution exposure by spending time in public parks and open space, or whether park-proximate areas have lower or higher pollution than regional averages. If, for example, ambient pollution is worse in parks located in poor or minority neighborhoods, encouraging physical activity in such parks may be problematic.

Objectives:
The overall goal of this research was to understand the distribution of traffic-related pollution both within and nearby communities across a major metropolitan region, Los Angeles (LA), CA., and patterns of environmental inequity in terms of park access and park pollution. To achieve this goal, specific objectives included: 1) characterizing inequality of access to parks as measured by parkland acres and inequality of available green spaces represented by vegetation greenness; 2) modeling and analyzing long-term average concentrations of traffic-related pollution, fine particulates and ozone concentrations in Los Angeles for parks, around parks, in comparison with levels for the region as a whole, and 3) identifying socioeconomic and racial-ethnic inequalities in exposure to these three pollutants.

Methods:
We assumed that parks within 'easy' walking distance were not more than 500 m from home, and thus created quarter-mile network buffers to represent neighborhoods around parks. Vegetation greenness within park polygons was derived from Landsat Enhanced Thematic Mapper Plus (ETM+) data through a tasseled-cap transformation. Traffic-related pollutant concentrations (i.e., NO_2) were modeled using a distance decay variable selection strategy to 181 monitoring sites in LA . Fine particles were interpolated using measurement data from 23 state and local district monitoring stations in the LA basin for the year 2000 using a combination of universal kriging and multi-quadric models. Ozone concentrations were created by interpolating measurement data at 42 sites in and around the LA basin from the California Air Resources Board database. The modeled concentrations for the three pollutants were extracted for parks, neighborhoods around parks, and the Los Angeles region as a whole.

Pearson correlations were used to analyze inequality in access to park acres and park vegetation cover along socioeconomic and racial-ethnic gradients. To identify inequality in exposure to the three pollutant concentrations, each pollutant was modeled in three separate multivariate models using the same socioeconomic and racial-ethnic variables across network buffers, network buffers plus parks, and the region as a whole. Model prediction parameters of the three scopes were compared variable by variable for each pollutant, and the significance of difference in inequality in exposure to that pollutant examined.

Results:
Public parks had lower traffic-related pollutant and fine particle concentrations, but higher ozone concentrations than the LA region as a whole. Neighborhoods around parks had the highest traffic-related pollution and fine particle concentrations, but the lowest ozone concentrations compared to the regional average. Vegetation cover was identified as being highest in public parks and lowest at neighborhoods around parks. However, more than 50% parks were within 1 km away from freeways and traffic-related pollution and fine particles in those parks were higher than pollutant concentrations for the Los Angeles region as a whole. Poor and minority neighborhoods around parks were characterized by higher ambient air pollutant concentrations, lower vegetation cover and smaller park sizes. Exposure levels were particularly disproportionate for Latinos.

Conclusion:
While we credit lack of money, personal health, safety concerns and biological factors might contribute to less recreational use of parks for populations of color and low income around public parks, the disproportionately higher environmental burdens mentioned above probably may also play a significant role. Urban planners and policy makers should focus on the development of new parks, providing more park facilities and activities, increasing park vegetation cover and making parks safer in disadvantaged neighborhoods, but they also need to work to decrease air pollution in and around parks in such communities. A better environment in and around public parks for those disadvantaged populations will assist in improving their quality of life, promoting more active participation across the life course in recreational use of parks, and thus improving their health outcomes.

42) Support for Youth Physical Activity Opportunities

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Background:
Despite the known benefits of physical activity, only a small percentage of youth in the U.S. are active on a regular basis. Increasing the number of youth physical activity opportunities (YPAO) (e.g., programs) may be a promising approach for encouraging physically active lifestyles among youth. In order to enhance the development, implementation, and maintenance of YPAO, information is needed regarding their support systems (e.g., sources, motivations for support, types [financial, in-kind]). We are particularly interested in the role of small businesses because of their potential to be a powerful mechanism for supporting YPAO and promoting physical activity (small businesses represent >97% of all businesses).

Objective:
To begin to construct a comprehensive description of YPAO support systems at the neighborhood level.

Methods:
The first aim was to obtain detailed information about YPAO available to the public including their characteristics (e.g., amenities), operating costs, and the sources of support for the operating costs. The second aim was to describe characteristics related to supporting YPAO. Data from four minority (>70% minority) and four non-minority (<10% minority), inner-city neighborhoods was obtained over an eight-month period using quantitative (e.g., surveys, community tours) and qualitative (e.g., key informants) data collection methods.

Results:
Small business were more likely to currently support YPAO if their owner was middle-aged (40-50 years of age), white, with a sports background, and children between 5 and 16 years of age. Only 33% of the business owners surveyed supported YPAO and less than 1% did this to advertise their business. Although YPAO support levels were low, all owners (those from businesses that did and did not support YPAO) believed small businesses should support YPAO and they understood how it can make a difference.

Three main themes emerged regarding the culture of support. First, business owners were more apt to offer support for YPAO if family and friends were involved. Second, business owners tended to be aware of and offer support for broad initiatives focused on neighborhood improvements but experienced barriers to specifically supporting YPAO. For example, information about YPAO that needed support was not readily available and few organizations that solicited support for neighborhood initiatives allowed supporters to select initiatives they may have want to support such as YPAO. Third, prominent stakeholders within a neighborhood heavily influenced the culture of giving even by small business owners. This is important because such stakeholders could be used to champion support from small businesses for YPAO.

Several barriers to supporting YPAO by small businesses were identified. Small business owners did not track how their support was used and therefore did not receive feedback on the impact of their support. Credit was seldom given to small businesses for their support negating possible returns on their investments (e.g., positive exposure leading to increased business). Owners had little knowledge of who needed help and why they needed help within the neighborhood where their business was located, thus they did not know who or what cause to support. Some owners were not willing to give support because they did not trust the population of the neighborhood where their business was located and did not believe the support would be used for legitimate purposes. This was particularly true for non-minority business owners with a business in a minority neighborhood.

Conclusions:
The results from this preliminary study indicate the potential exists for involving small businesses in initiatives that support YPAO. Characteristics of small business owners, cultural trends regarding support, and the existence of modifiable barriers to support were identified that may prove to be important components of an intervention aimed at promoting small business support for YPAO.

Support:
Robert Wood Johnson Foundation's Active Living Research Program.

43) An Integrative Positive Approach to Community-Based Interventions

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Poster presented by: **Julia Franklin Summerhays**, PhD, University of Utah

Background:
As obesity and its associated ills have become more prevalent in American society, researchers from a variety of disciplines have sought to identify causes and prescribe prevention techniques. The majority of tested interventions however focus on a single aspect of community (i.e. built environment, worksites, transportation, nutrition, etc.) in turn compartmentalizing and marginalizing any potential benefit. In order to create a truly comprehensive community based intervention, a community must be recognized as a holistic system consisting of several influential strata including schools, media, churches, recreation centers, businesses, health care, governments, and policies.

Objectives:
This research seeks to test positive integration theory by overwhelming a single community with a variety of concurrent interventions in order to create and sustain a community environment that makes healthy living an easy choice for residents. A positive health approach embraces not only the promotion of physical activity and healthy eating but also the enrichment of the mind and human spirit, and is grounded in a realistic assessment that behavioral changes promoting healthy weight are difficult and need to provide individuals with as many incentives as possible to embark on and sustain lifestyle modifications.

Building on individual, group, and community strengths, this process utilizes a variety of local organizations to spearhead or oversee policy support and change; educational programs; social marketing; media programs; community events; and multiple levels of educational and social interventions concurrently. It is hypothesized that exposing residents to positive health interventions in all aspects of their lives (school, work, play, church, etc) will be more effective at promoting healthy behaviors and lifestyles than single-focus community interventions.

Methods:
This research focuses on two suburban communities in the Salt Lake City Utah Metropolitan Area; Magna Township and Tooele County. Both were selected based on BRFSS small area data in which they were identified as the two small areas in the state with the highest levels of obesity and morbidity and poor health. Additionally, both areas are similar in demographic make-up. For the purposes of this research and in order to control for the impact of the interventions, Magna Township serves as the experimental population and Tooele County the control population.

Prior to the development of appropriate interventions, focus groups and needs assessments were conducted in Magna Township and Tooele County with representatives of all the various strata within the community, including schools, churches, cultural groups, recreational facilities, service clubs, businesses, media, and government. The goal of this process was to identify the history, values, traditions, strengths, and points of pride of the communities, which would serve as the basis for potential interventions. These focus groups allowed citizens to identify their perceived community needs and provided them with a sense of ownership in the process. Next epidemiological analyses were conducted in order to identify and select interventions that are most likely have the greatest impact on the promotion of healthy weight in these two specific communities. This process included the creation of logic models, setting of goals, and incorporation of proven behavior change theories.

Following the completion of the needs assessment, the research staff created a multidimensional, multi-targeted strategy to integrate multiple interdisciplinary interventions, as well as persuade influential individuals, programs, and organizations in the community to monitor and promote good nutrition, active living, stress reduction, and enhancement of personal "resilience" (the ability to grow through adversity). Following the identification of appropriate community based interventions a pre-assessment was conducted to collect baseline data for each correlate being manipulated for later comparison and evaluation. Interventions were then introduced systematically, one at a time, with appropriate metrics being taken at predetermined intervals throughout the process to protect construct validity.

At the conclusion of the process complex longitudinal data models will be employed to identify change over time within the community (using data from Tooele County as a control). These models will include statistical controls for the variety of potential confounds expected in a multi-dimensional intervention system.

Results:
This research is ongoing; however, it is already revealing a vigor and enthusiasm for health within the community. Focus groups revealed very clear analogous ideas for promoting healthy change within the community, showing that the local population is aware of their own unique needs. Additionally, the preliminary intervention data are showing promising results suggesting that this multifaceted approach is in fact effective.

Conclusions:
The empowering nature of the program will allow Magna to sustain an effective healthy lifestyle program in the community. This positive community healthy-weight approach will additionally be documented as it is undertaken in order to facilitate replication both in Utah and beyond. Because each community will integrate its own history, culture and strength into its healthy-weight initiatives, the replicability will be found not in program specifics, but in the process of creating a program tailored to a specific community. The disciplined, community-driven program planning and evaluation process will be replicable anywhere.

44) Effects of the Built Environment on Physical Activity and Obesity on a Large Sample of Older Women Living in Three U.S. States: Preliminary Findings

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Background:
Physical inactivity and obesity are significant public health problems that disproportionately affect older adults. In the U.S. recent physical activity estimates from the National Health and Nutrition Examination Survey (NHANES) based on accelerometer assessments showed that mean minutes (min) per day of moderate activity was lowest among adults 70+ y (8.6 min), followed by adults 60-69 y (16.3 min), and adults 50-59 y (25.3 min). NHANES data also indicated that the likelihood of obesity among men and women 60-79 y was roughly 2.5 to 3 times greater than it was among young adults (20-39 y). Recent studies have begun to provide evidence that certain attributes of the built environment may influence physical activity behaviors and obesity in older adults. For example, one study in the Pacific Northwest found that neighborhood-level measures of land use mix and connectivity were related to higher levels of neighborhood walking, walking for transportation and errands, and meeting physical activity recommendations in adults, 50-75 y. Despite a growing evidence base, built environment research among older populations is still at a nascent stage.

Objectives:
The primary objective of this study was to examine associations between individual-level, objective measures of the neighborhood built environment and both physical activity and obesity outcomes among a large sample of older women.

Methods:
This cross-sectional analysis used a sub-sample of participants from the Nurses' Health Study (NHS), a cohort study initiated in 1976 with 121,700 female registered nurses. Inclusion criteria were: 1) Massachusetts, Pennsylvania, or California resident; 2) completed 2004 NHS survey; and 3) has geocoded home address. Women reported the average time per week that they engaged in different recreational physical activities during the past year, including walking for exercise or walking to work, bicycling, jogging, and running. MET min/week for each type of activity was calculated and two binary outcomes were created: meeting the current recommendation of 500 MET min/week based on walking only and based on a combination of walking, bicycling, jogging and running. Body mass index (BMI) was determined with self-reported height and weight; obesity was defined as BMI => 30. Geographic information systems procedures were used to create objective built environment variables within 800-meter line-based network buffers around participants' homes using public and commercial data sources. Variables included population density, intersection density, land use mix, and density of walking destinations. Multivariable logistic regression models are being used to estimate associations between built environment variables and key outcomes, adjusting for potential confounders.

Results:
Data were analyzed on 24,148 women (mean age = 70.3 ± 6.9 y) who had complete physical activity data. Walking averaged 211.7 ± 467.2 MET min/week, while mean MET min/week of combined walking, bicycling, and jogging/running was 354.5 ± 712.3. The proportion of women who met current physical activity recommendations based on walking and based on the four activities was 15.1% and 22.5%, respectively. Participants' mean BMI was 26.5 ± 5.3 and 20.0% were obese. Age-adjusted models indicated that

population density (units = 1000 persons/square km) was positively associated with meeting activity recommendations based on walking (OR = 1.04; 95% CI: 1.02, 1.06) and with meeting recommendations through a combination of walking, bicycling, and jogging/running (OR = 1.03; 95% CI: 1.01, 1.05). Alternatively, population density (OR = 0.98; 95% CI: 0.96, 1.00) was negatively associated with obesity. Analyses of the other built environment variables are underway.

Conclusions:
Substantial proportions of older women in this study do not appear to meet current physical activity recommendations and are classified as obese. Preliminary models indicate that consistent with prior research higher population density is associated with a greater likelihood of meeting physical activity recommendations and a lower risk of obesity. Further analyses will focus on the effects of other built environment variables on these outcomes, while accounting for co-morbid conditions, health risk behaviors, such as smoking and dietary intake, and social factors.

Support:
This study is funded by the National Cancer Institute (521CA125078-2).

45) Wellness Communities 24/7

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Background:
Enormous concern exits in the U.S. regarding growing child obesity rates, yet there are limited examples of effective obesity prevention programs for children. Because obesity is a multifactorial disease, we aimed to take a multi-partner, community approach to study the feasibility and effects of a community-based childhood obesity prevention intervention that partnered senior nursing students with elementary school children to teach, coach and support healthy physical activity habits for life. Partners included Mayo Clinic, two public school elementary schools, two local schools of nursing, and the local public health department.

Objectives:
Our specific aim was to test a childhood obesity prevention intervention that involved the 5-2-1-0 curriculum delivered in the classroom with 1:1 coaching delivered by senior nursing students on physical activity levels, health behavior change, and BMI among 4th and 5thgrade school children. Our primary hypothesis was that the intervention would result in significant increases in child physical activity levels from baseline to post-intervention.

Methods:
Ninety-eight children from two elementary schools (School 1: 10 ± 0.7 years old, 74.3% normal weight, 14.3% overweight, and 11.4% obese; School 2: 10 ± 0.3 years old, 64.2% normal weight, 17.9% overweight, and 17.9% obese) participated in the program. Classrooms were randomized as intervention or control classrooms. All children (control and intervention) received classroom content delivery of the 5-2-1-0 intervention by the public health school nurse. The 5-2-1-0 intervention provides a standardized mechanism for teaching children about healthy physical activity levels and healthy nutrition and was designed to be delivered using principles and tools of motivational interviewing and coaching. The 5-2-1-0 components include eating ***5*** or more fruits and vegetables each day, cutting screen time to ***2*** hours or less per day, participating in at least ***1*** hour or more of moderate physical activity every day, and consuming ***0*** soda & sugar-sweetened sports drinks and limiting fruit drinks. Children and their families randomized to the intervention classrooms also received 1:1 coaching by nursing students, parent evening offerings, and reinforcement incentives for the children and teachers, although the 1:1 coaching varied by school. The nursing students were trained in the 5-2-1-0 curriculum as well as in motivational interviewing principles and tools. At School #1, the intervention started in the fall semester and lasted until late in the spring semester (6 month intervention with variable number of sessions ranging from 2 sessions to weekly sessions). The nursing students (from Nursing School #1) coached the elementary students *outside* of the school setting with indirect supervision from nursing faculty. They also independently contacted and scheduled visits with parents and children. At the second elementary school, the intervention started after the winter break and lasted until late in the spring semester (4 month intervention with weekly sessions). The nursing students (from Nursing School #2) coached the elementary students during weekly visits at lunchtime *inside* of school under the supervision of a nursing faculty member on site. Baseline and post-intervention data were collected for physical activity (pedometer) and BMI. Children wore a pedometer (Stepwatch) for 4-5 school days at the beginning and end of the intervention. In order to address our project hypothesis, tests of comparison over time and between groups were calculated using paired t-tests.

Results:
Children who participated in the program were meeting recommended guidelines for physical activity. For all children who participated in the intervention, there was no significant change in BMI or BMI percentile between baseline and post-intervention (BMI = 18.7 ± 3.7 kg/m^2, 19.0 ± 3.7 kg/m^2, BMI percentile = 60.7 ± 28.5, 61.5 ± 28.1, baseline, post-intervention, respectively). There was no significant difference between baseline and post-intervention for children's physical activity for the children at School #1, whether the child participated in the control or intervention classroom. However, we observed significant increases in children's physical activity from baseline (10,494 ± 419 steps each day, Mean ± SEM) to post-intervention (15,466 ± 585 steps each day) for *all* children (control and intervention) at School #2. We also noted that among the children whose BMI was >85th percentile at baseline, decreases in BMI percentile were observed for 77% of children at post-intervention at School #2, compared to School #1 where only 52% of children had a decline in BMI percentile. Additionally, at School #1, three new children moved into the overweight category at post-intervention.

Conclusions:
A multi-partner, community approach to obesity intervention shows potential for increasing physical activity in elementary school children when the intervention includes classroom content coupled with structured 1:1 coaching sessions for individual children. The project has great potential as an environmental strategy for increasing physical activity and reducing childhood obesity, with sustainability and generalizability as it employs a service-learning approach that offers an otherwise unavailable resource to families while providing an important learning setting for nursing students.

Support:
Robert Wood Johnson Foundation's Executive Nurse Fellows Program and Mayo Clinic

46) Site and Neighborhood Environments for Walking among Older Adults

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Background:
Walking can help promote or maintain good health among older adults, and thus enhance senior independence and reduce the need for senior services. The built environment has been recognized as an important correlate of walking. Previous studies have focused on the larger neighborhood conditions, overlooking *the detailed site-level characteristics*, which may have a more direct impact on walking. Older adults are more environmentally docile than young adults and spend more time in proximate outdoor places such as their own yards. It is unclear if findings from the previous environment-walking studies focusing on general adult populations remain valid for older adults.

Objectives:
This study is to examine both the site-level and the neighborhood-level environments, and to identify their specific features associated with walking among older adults.

Methods:
A retrospective survey of 114 cognitively competent older adults was conducted. Participants were recruited from five assisted-living facilities in Houston, TX. Questions from previously validated or tested questionnaires were adopted for the survey instrument. Participants were asked about their past walking behaviors when they lived in their own homes and perceptions of the residential site and neighborhood environments. Older adults are shown to have long-term recall ability and capable of reliably estimating their physical activities that occurred up to ten years ago. Geographic Information System (GIS) was used to verify the survey responses and further examine the objective measurements of environments on a subset of 61 participants' residences.

Site-level environments were assessed for the layout/design of and within the individual residential parcel/lot. Survey variables included building type, building height, indoor-outdoor structures (e.g., steps or flat entrances), indoor sunshine, window view, yard landscaping, walkability, paving, and canopy shade. GIS variables included lot type, size, building coverage, year built, building orientation, frontage street orientation, presence of transitional areas, number of connecting paths, size of side areas, and building setbacks.

Neighborhood-level environment variables captured from the survey were walking destinations, neighborhood interest, walking-route choices, sidewalk usability, safety from traffic and crime, lighting condition, and availability of roadside seating and restroom. GIS measures were taken from circular buffer areas of four radii (¼, ½, 1, and 2 miles) from each participant's home. They included numbers of daily-life facilities, areas occupied by roads, and distances to selected destinations (the nearest park, bank, post office, drugstore, healthcare facility, food establishment, and general daily-life facility).

Bivariate tests and multivariate logistic regression models were used to identify environmental variables correlated to the odds of walking at least once a day in neighborhoods (frequency) and to the odds of walking at least ten minutes per occurrence (duration).

Results:
After controlling for personal and social factors, *yard landscaping* and *corner lot location* were significant site-level variables associated with older adults' walking. The number of *walking destinations*, *safety from crime*, and *sidewalks* were significant neighborhood-level variables. Bivariate tests identified additional site-level correlates, including *indoor sunshine*, *window view*, and *walkability*, as well as neighborhood-level correlates,

including *areas occupied by roads within ½ mile from home*, *walking-route choices*, *proximity to the nearest drugstore*, *neighborhood interest*, *safety from traffic*, and *lighting condition*.

Site-level variables that were positively associated with both the frequency and the duration of walking were walkability, indoor sunshine, and window view. Living on a corner lot was positively correlated with the duration, while having good lot landscaping was positively correlated with the frequency.

From the neighborhood-level variables, walking destinations, neighborhood interest, walking-route choices, roadside seating, safety and lighting were correlated with both the frequency and the duration of walking. Proximity to drug-stores and good sidewalks were positively associated with the duration, and having more roads within ½ mile from home was positively correlated with the frequency.

Among the personal and social variables, *self-reported ability to walk one mile* and *social cohesion* of the neighborhood were significant.

Conclusions:
Walking among older adults is correlated with both site and neighborhood environments. Micro-scale environments at individual residences appear to be important for older adults. The roles of residential site environments in shaping occupants' behaviors need more attention. To better understand site versus neighborhood influences on physical activities among older adults and other population groups, more empirical studies and longitudinal research are needed.

Support:
This research was funded in part by the American Institute of Architects RFP Program and the Center for Health Systems and Design at Texas A&M University.

47) Engaging University Students in Trail Research

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Background:
While trails have long been viewed as recreational facilities for active uses, they are assuming a larger role in transportation networks because they provide alternatives to on-street routes that can promote walking and bicycling as travel modes. Local jurisdictions need data on how their trail networks are being used, and how they encourage people to choose to walk or bicycle for daily trips. In Portland, Oregon, the regional government (Metro) is responsible for regional transportation and trail planning. Metro is working to integrate trails into the transportation system and needs data to demonstrate that the trails are used for utilitarian trips as well as recreation.

Portland State University requires all undergraduate students to participate in a Senior Capstone course that integrates academic goals with a community-based learning experience. Each course has a community partner that is an active participant in the course development and student experience. Faculty and Metro staff members, assisted by a graduate research assistant, designed a Senior Capstone course curriculum to engage undergraduates in learning about the trail system and conduct research on how it is used.

Objectives:
This project was designed to achieve two objectives:

1) Collect data on trail use in Portland, Oregon, specifically the number of pedestrians and cyclists that use the trails for transportation and functional purposes. This will help regional planners better plan and integrate the trail system into the transportation network.
2) Engage undergraduate university students in a community-based learning Senior Capstone to design and execute research in collaboration with regional trail planners.

Methods:
Faculty and Metro staff designed a course to introduce the concepts of trail and transportation planning and conduct research on trail use. They identified study sites within the City of Portland and designed the research following research tools:

- site inventory and analysis
- manual counts of trail users
- electronic counts of trail users
- intercept surveys of trail users

Undergraduate seniors participated in a ten-week course in spring, 2009. They conducted several site visits to document site conditions. Working in teams of two, they conducted manual counts at each site during a two-hour period on a weekday and weekend for two weeks. They conducted intercept surveys during the same periods during the next two-week period. The faculty worked with city staff to install, move and download data from the electronic counter. The students entered, coded and analyzed the data, and produced a report which they presented to the Metro staff and one councilor.

Results:
Students completing the course evaluations indicated that they felt a personal responsibility to meet community needs and that their work benefited the community. They also said they were more aware of the trail system and that they walked and bicycled more as a result of the course work.

Students' analysis indicated that while most trail users were there for exercise/recreation, some trail segments were used for commuting trips on a regular basis, and that most commuters were bicyclists. The proportion of cyclists traveling on the trail away from the city center between 4-6 pm for commuting was higher than those using trail for exercise.
They also found that most trail users live or work near the trail. Their site analysis indicated that the less-used trail segments lacked directional signage and had a poorer surface quality than the heavily-used trails.

Conclusions:
University students are an under-used but promising resource in promoting active living, conducting research and advocating for improved conditions. This project demonstrated that courses can engage students in meaningful research on trail use, and their involvement with the research also can raise their awareness of active living and encourage them to use trails more and to walk or bicycle for transportation.

Now that the curriculum and instruments have been developed, the course can be repeated each year, allowing for longitudinal data collection, which can be difficult to fund. The survey and manual count instruments can be shared, allowing for comparative research as well. However, two limits to the research were identified in this project. First, trail site selection was limited to areas which were relatively close to campus to limit travel time, and those that were accessible by foot, bike or transit to ensure the students could easily conduct the field work. In addition, the days and hours of the field work were constrained by the students' academic and work schedules, while the number of field hours was constrained by the length of the term.

The results of this research have implications for transportation policy and planning. Learning that bicyclists use the close-in trails for commuting purposes indicates that trails can and should be integrated into bikeway networks and should be considered when public agencies develop bicycle master plans. In addition, surface quality and signage should be addressed in local policies and plans.

Support:
This project was funded by the Oregon Transportation Research and Education Consortium.

48) Using Technology to Promote Youth Physical Activity in Structured Program Settings

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Background:
Innovative technologies provide children with an abundance of entertainment options involving indoor, sedentary activities (Yancey, et al. 2009). Since these sedentary activities compete for the same time resources as other more active pursuits, it is not surprising then that children's use of technology has increased and has been linked to reduced leisure-time physical activity (Kautiainen, et al. 2005). Although researchers have developed interventions to reduce the amount of time children spend using screen-based media during leisure-time, attempts to substitute adolescents' screen-based time with less valued activities have often been unsuccessful (Lanningham-Foster, et al. 2006). An alternate approach for reversing sedentary behavior uses *activity-promoting* video and computer games (Lanningham-Foster, et al. 2006). The majority of research linking youth and technology thus far has focused on non-programmatic interventions to reduce youth's screen based media time (Boone, et al. 2007; Faith, et al. 2001; Harrison, Burns, McGuinness, Heslin, & Murphy 2006; Jason & Brackshaw 1999; Marshall, Gorely, & Biddle 2006). Large numbers of youth involved in structured after-school activity settings at schools and with private or non-profit recreation agencies including YMCAs, faith-based recreation and Boys/Girls Clubs of America suggest a need to increase group-based youth activity. The current study compares physical activity outcomes achieved during youth group fitness sessions with and without a technology intervention.

Objectives:
Identification of technological mechanisms that can increase PA in structured program environments is one approach to combat rising youth obesity. The current study investigates the efficacy of a HOPSports technology® for increasing PA in a structured activity setting. Research questions included:

1) Were youth more or less physically active during the group fitness sessions that used HOPSports® technology?
2) Which youth (i.e. gender, race/ethnicity, grade level and body mass index) were most affected by the technology intervention during group fitness sessions?

Methods:
HOPSports® (HOPS) is a multimedia, education and entertainment program intended to provide sport-specific training, as well as engage youth in a wide array of cardiovascular and strength training programs. Select physical education teachers in North Carolina were provided with HOPSports® technology during the 2007-2008 school year. A total of 387 youth in grades 4-8 from three North Carolina schools participated in an assessment of PA outcomes using rooms equipped with the HOPSports® technology system. The presence or absence of the technology intervention was the primary independent variable. Other variables included youth gender, school grade, race/ethnicity and body mass index. Dependent variables consisted of minutes of moderate and vigorous activity measured with Actigraph GT1M accelerometers (30 second epoch). Repeated measures analysis of variance was undertaken to compare activity outcomes during structured programs with and without HOPSports technology. Analyses of covariance were undertaken to test for differences in intensity according to student demographics.

Results:
Youth were significantly more active, on average, when using HOPS compared to a traditional fitness session (23.6 versus 15 minutes of a 40 minute session). When the type of activity was considered, no significant differences were detected in sports participation with and without technology. When personal factors were

considered, youth with healthy body weights and those in lower grades were more active when using HOPS than youth who were overweight or obese and older. Boys were significantly more active than girls during sessions without the technology intervention. However, boys and girls had similar (higher) activity levels during HOPSports participation. No differences in HOPS' efficacy were observed by students' race/ethnicity.

Conclusions:
If HOPSports technology were integrated into physical education classes in North Carolina, current findings indicate that, despite meeting only twice each week for physical activity, youth would receive a projected 12.6 additional hours of MVPA each school year. If HOPS were adopted as an optional curriculum for afterschool programs, the impact stands to be even greater since afterschool programs can serve up to 40% of a local population on more than 180 days annually (Afterschool Alliance, 2008). Despite the potential for exciting gains with the use of technology, it is important to recognize the potential role of novelty and activity selection in the technology's efficacy. Although youth were significantly more active using HOPS, this was due largely to the types of activities used in HOPS. When specific HOPS activities were compared to similar non-HOPS activities, no differences were found. Findings are limited by the flexibility given to the instructor to choose the activities in which their classes participated each day, thereby resulting in fewer exact matches for comparison. The most significant value of this technology, therefore, may be in its provision of a variety of relatively easy to facilitate activity lessons, some of which, such as Hip Hop Dance, instructors may not feel comfortable or capable of teaching or modeling. In addition, activity lessons may benefit from the continuous video modeling, upbeat music and verbal cues as part of the lesson.

Support:
Funded by Be Active North Carolina and Be Active Appalachian Partnership.

49) Validation of a Commercial Geographic Information System Database of Walking and Bicycling Destinations

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Background:
Recent interdisciplinary studies in public health, transportation, and urban planning have shown that stores and other destinations such as banks, post offices, and physical activity facilities within close proximity to residences are positively related to recreational and transportation physical activity. The built environment has been measured several different ways, including conducting field audits and by surveying individuals' perceptions of their neighborhood. Increasingly researchers are also using geographic information systems (GIS) software and commercially available data sources to create objective measures of the built environment. The advantages of commercial data are that they are relatively easy to access and are regularly updated. Despite these advantages it is important to assess the validity of these databases for developing measures of accessibility and density of neighborhood destinations. Two recent studies have investigated the validity of GIS databases of physical activity facilities and food stores, but to our knowledge less research has been conducted to validate a broader range of facilities that may serve as important walking and bicycling destinations.

Objective:
The objective was to assess the validity of a commercially-available GIS database of facilities that may serve as walking and bicycling destinations for adults.

Methods:
Researchers conducted field audits to verify the presence of 402 facilities contained in a commercial database. A list of North American Industrial Classification System codes was reviewed to identify the types of commercial facilities in the database which could serve as walking or bicycling destinations for adults. These were further categorized into five domains; food and drink (n=139), social or cultural organizations (n=115), retail establishments (n=101), services (n=28), and physical activity resources (n=19). Two high, medium, and low population density tracts in both Hartford County, Connecticut and Tippecanoe County, Indiana were selected for the analysis (12 tracts in total). Three levels of agreement were defined; 1) facilities in the database were considered to be an "exact match" if they were located on the same street segment and had the same proprietary name, 2) "close to exact match" if the facility was located on the street segment and was of the same domain, but with a different proprietary name, and 3) an "adjacent street segment match" if the facility was found to be located on an adjacent street segment. The percentages of facilities in the database that were located in the field were calculated overall, and by county, population density, and domain. Chi-square analyses were used to examine differences in match rates by county, population density, and type of facility.

Results:
Overall, among the 402 facilities examined, field audits identified 67.7% were an exact match. When the 'close to exact matches' were included the percentage matched increased to 76.9%, and with the addition of adjacent street segments it increased to 85.8%. Percent agreement for exact matches was higher in Tippecanoe County than Hartford County (71.5% vs. 63.9%). However when all three levels of matches were

included the percent agreements for the two counties were more similar (86.5% vs. 85.1%). Overall, match rates were higher in high population density census tracts than in low population density tracts (71.0% vs. 60.6%). Among the five facility domains, the exact match rates were 64.0% for food and drink establishments, 64.3% for services, 67.3% for retail establishments, 70.4% for social and cultural organizations, and 84.2% for physical activity facilities. Overall, chi-square analyses did not show statistically significant differences in match rates by county, population density, or by domain.

Conclusions:
The results of this validation study demonstrated moderate to good accuracy of the commercial GIS database with more than two-thirds of the facilities correctly located in the field overall. The estimates generated in this study were similar to those in two previous validation studies of physical activity facilities and food stores which found agreement was 71%-73%. The findings in this study suggest that the commercially available GIS database provided a valid alternative to conducting extensive field audits or resident surveys.

Support:
This study is funded by the National Cancer Institute (521CA125078-2).

50) Assessment of Daily Walking Activity for Office Workers in Texas

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Background:
Sedentary lifestyles and the associated health outcomes have become global health challenges for the 21st Century. Transportation costs in terms of fuel and vehicle related costs have risen 13.4% between 2000 and 2005 with income rising much less at 10.3% (Lipman et al. 2006). Further, our land use patterns continue to feed the need for driving with suburbanization rates rising from 55.1 % in 1970 to 62.1% in 1996 (Lipman et al. 2006).

In 2008, estimates of occupational employment the Bureau of Labor Statistics indicated approximately 43% of jobs in the U.S. were in positions that are typically 'office' work, where most activity is done behind a desk using a computer (Braddock 1999). According to the Texas Workforce Commission, 42% of Texans hold office-type jobs consistent with the national statistics (Texas Workforce Commission 2006). The general profile of an office-type job involves mostly sitting for 8 hours or more in a day on most days of the week. If physical activity can be integrated into daily routines, reducing time barriers to accomplish this healthy activity, the likelihood of it becoming a daily habit is increased (Blair et al. 1992; Dietz 1996; Dunn et al. 1998).

Objectives:
This research compares daily walking behaviors among office workers from two land use settings in Texas, urban setting in Austin and suburban setting in College Station, and assesses built environment features associated with walking levels for this population.

Methods:
This cross-sectional study involved office workers from two large universities in Texas with comparable sizes but with distinctively different environmental settings. Participants completed an online survey developed using questions from Behavioral Risk Factor Surveillance System Survey, Walkable and Bikeable Communities Survey, Neighborhood Environment Walkability Scale, and Healthy Aging Network Environmental Audit Tool (Lee 2006; Saelens et al. 2003; Prevention Research Centers Healthy Aging Research Network 2005; Centers for Disease Control and Prevention 2006). Participants also wore a pedometer and kept an online travel diary tracking all transportation trips and walking step counts for a total of 6 days over one month. This study utilized logistic and linear regression models to estimate three separate outcome variables: walk trips/ week, walking duration/week and total step count/day.

Results:
The baseline survey yielded a 34.9% response rate (N=675). Urban and suburban office workers reported a similar number of daily walk trips (Urban mean=2.17, Suburban mean=2.12). Urban office workers were more likely to have 3 or more walk trips per week than suburban office workers (69.7% vs. 56.8%). From pedometer step counts, urban office workers walked on average 600 more steps per day than their suburban counterparts. Most office workers in both land use settings did not meet the recommended 10,000 walking steps per day (Urban mean=4,932 steps, Suburban mean=4,347 steps) (CDC 1996; Choi et al. 2007).

Regression models showed that after controlling for personal and organizational variables, built environment variables, especially those destinations suited for office workers such as coffee shops, restaurants and bookstores, were associated with walking levels. Logistic models for walking duration for the urban office workers indicated correlations with that banks (OR=3.949, $p<.05$) and food establishments (OR=.913, $p<.10$) within walking distance. Suburban office workers walked less with perceived barriers within

the built environment such as no interesting things to look at (OR=.439, p<.05) or insufficient crosswalks (OR=.199, p<.05).

From a transportation perspective, urban and suburban office workers were more likely walk more trips per week if a bookstore was in close proximity (Urban Walk Frequency Nagelkerke Pseudo R-Square= .342, Bookstore: OR=11.28, p<.05, Suburban: Nagelkerke= .485, Bookstore: OR=11.28, p<.05).

The linear regression model results for total step count included the urban model with proximity to Dry Cleaners (=993.33, p<.05) and Convenience Stores (=2,348.50, p<.001) as the significant built environment variables ($R^{2=}$ .576, Adjusted R^2= .483). For the suburban model, an increased number of coffee shops (=1,522, p<.05) also increased walking steps (R^2 = .252, Adjusted R^2= .186).

Conclusions:
Connecting utilitarian land use destinations near office sites may facilitate office workers increasing walking to satisfy daily transportation and physical activity requirements. Destinations such as coffee shops, restaurants, and bookstores within ¼ mile from the worksite may be recommended for land use planning.

Limitations
The limitations of this study include the duration of the data collection, sample diversity, and pedometer instrument. Based on the pilot test, 2 days of data per week was determined to be more feasible workload. For personal variables, the sample did not have adequate representation of minorities or men. The former is due to a fairly low diversity level of total office employees in both land use settings. Pedometers, with noted drawbacks such as placement on different individuals or miscounting steps, was selected due to the size of the sample (Phase II: N=540) and limited budget.

Support:
Preparation of this study was supported by a grant from the Robert Wood Johnson Foundation's Active Living Research Program.

51) Translating Research into Action: Model Policies for Active Living

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Background:
Children, particularly those in low-income and minority communities, often lack opportunities for regular physical activity, resulting in higher rates of obesity and health disparities. Research has identified both environmental obstacles to physical activity and related opportunities to increase activity. This workshop will discuss research conclusions on obstacles to active living and will showcase a number of policies that translate such research into concrete tools for local governments, school districts, and advocates who want to successfully increase children's physical activity. The workshop will present a variety of model policies intended to bridge the gap between research and action: policies on complete streets, joint use of school sites, safe routes to school, pedestrian-friendly zoning requirements, and physical activity standards in childcare settings.

Objectives:
To increase physical activity in children by creating policies to encourage active living which communities can easily adopt and implement.

Method:
As part of a comprehensive effort to address the problem of childhood obesity, the National Policy and Legal Analysis Network to Prevent Childhood Obesity (NPLAN) develops tools to translate research on obstacles to physical activity into community action on a national scale. NPLAN is a national project of the Robert Wood Johnson Foundation's childhood obesity initiative, and is housed within Public Health Law and Policy (PHLP), a legal research and technical assistance center based in Oakland, California. NPLAN supports the innovation and implementation of policies to reverse childhood obesity by empowering advocates and decision-makers with practical legal and policy tools. It provides legal research, model policies, fact sheets, toolkits and technical assistance aimed at increasing the capacity for advocates to create sound, innovative policy change in their communities.

To better understand physical activity advocates' legal and policy concerns, PHLP undertook a comprehensive needs assessment, conducting nearly 100 in-depth interviews with prospective stakeholders, including community-based advocates, health department staff, legal scholars, research scientists, and policy-makers. The needs assessment identified many specific legal and policy strategies that NPLAN could address to increase physical activity opportunities for children, including policies focusing on areas such as complete streets, joint use of school sites, safe routes to school, pedestrian-friendly zoning requirements, and physical activity standards in childcare settings. The interviews also reinforced the need to structure NPLAN so as to foster cross-disciplinary learning, creating an incubator where lawyers, policy-makers, advocates, and scientists "cross-pollinate" to develop new policy ideas.

Results:
NPLAN determined that there was a need to translate research into action by providing concrete policies that communities could adopt and implement in order to encourage active living. To achieve this goal, NPLAN developed legal research and tools on a variety of topic areas necessary to enable communities to encourage children to be active on a daily basis.
NPLAN has developed model policies in the following areas: complete streets, joint use agreements between schools and local government, safe routes to school, pedestrian-friendly zoning requirements, and physical activity standards in childcare settings. These model policies provide easily adoptable tools for communities. Factsheets, overviews, and accompanying legal tips allow communities to assess liability risks and

understand policy choices in adopting a given policy. These policies assist communities in successfully increasing children's physical activity.

Conclusions:
By translating research conclusions into model policies, communities and relevant actors such as school districts, childcare providers, and state and local governments can create environments conducive to active living.

Support:
Support for this project was provided by a grant from the Robert Wood Johnson Foundation's Active Living Research Program.