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PARTNERING TO ENABLE ACTIVE RURAL LIVING: PEARL PROJECT

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ABSTRACT

Rural residents in communities face opportunities and obstacles for physical activity (PA), health, and well-being that differ from those experienced in non-rural settings. Yet, rural people's interpretations of PA and experience of the PA environment are understudied. This study utilized a descriptive case study approach in three rural New Hampshire communities and engaged rural residents in community participatory action research of the experiential factors that enable or prevent PA for adults and youth in their communities. Qualitative data were collected using photo mapping surveys, participant observations, interviews, and focus groups; analyzed using a constant comparative method and triangulated across multiple sources. Themes emerged and were organized into an ecologically grounded “People and Places” framework. Results depicted how attributes of people and place interact to explain PA habits and conditions in these rural communities, and generated resident-informed recommendations for designing programs, modifying environments, and enacting policies to advance active lifestyle supports.

For well over a decade, efforts have been aimed toward understanding the conditions unique to rural residency that shape human health and health outcomes among rural populations (Gamm and Hutchison 2010; Merchant, Coussens, and Gilbert 2006; Ricketts 1999). Rural areas, as defined by the U.S. Department of Agriculture (USDA), are all territory, population, and housing units located outside urbanized areas and an urban cluster (John 2008). A growing body of research is documenting the rise in obesity and obesity related behaviors (poor dietary habits and physical inactivity) in rural communities (Blankenau 2009). Rural residents often have a higher obesity and hypokinetic disease risk profile than the public and rural adults are often less physically active than adults in urban zones (Patterson et al. 2004). Many risk factors, including rural residency, have been associated with

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children being overweight or obese (Davis et al. 2011; Lutfiyya et al. 2007; Veugelers and Fitzgerald 2005). Davis and others (2011), using data from the 2003-2004 and 2005-2006 National Nutrition and Health Examination Survey, found that obesity rates were higher in rural children than urban children. They additionally found that for children, meeting physical activity recommendations was obesity protective while engaging in more than two hours per day of sedentary electronic entertainment was obesity promoting (Davis et al. 2011). Accordingly, if public health efforts to address and prevent obesity among children and adults are to be effective, rural places are important settings and rural people important audiences for actions that promote physical activity and enable healthy, active lifestyles.

Physical activity research often focuses on individual factors and person-level behaviors. Rural residents encounter opportunities, as well as challenges, for meeting physical activity recommendations that are different from those found in urban and suburban settings. Natural rural landscapes may support outdoor and seasonal activities such as hiking, camping, canoeing, fishing, skiing, and snowshoeing. Maintaining rural residences and properties may enable physical activity through household chores, such as chopping wood, shoveling snow, clearing brush, maintaining gardens, and tending animals; rural occupations, such as forestry, agriculture, and even adventure programming may contribute to work-related physical activity when compared with office employment. On the other hand, rural communities may have extreme weather and geographic features, few or no sidewalks and bike lanes, and fewer amenities (e.g., playgrounds and schools) within walking and/or bicycling distance, which makes active transportation and recreation less convenient, unsafe, or even impossible for rural residents (Popkin, Duffy, and Gordon-Larsen 2005) and hinders unplanned physical activity for youth and families (Walia and Leipert 2012). In an attempt to understand physical activity factors with rural women, researchers found that rural mothers who reported lacking self-discipline, time, or interest were less likely to be physically active, and suggested that they may have difficulty prioritizing planned physical activity for themselves (Adachi-Mejia et al. 2010). Other cognitive factors such as rural residents’ attitudes and values toward physical activity and inactivity as well as residents’ perceptions of community features that make easier or harder active rural living are understudied and poorly understood.

An emerging body of work examines the environments and policies that support active rural living. Despite a natural landscape that may promote an active lifestyle, the rural built environment presents challenges to incidental and deliberate physical
activity. Physical environment features that limit physical activity among adults and youth include rural community designs and land use policies, fewer public transit options, and spatial characteristics that increase dependence on automobiles (Adachi-Mejia et al. 2010; Hennessy et al. 2010; Walia and Leipert 2012). Rural communities often have inadequate outdoor (parks and playgrounds) and indoor (community centers, swimming pools, and sport courts) spaces for children and adults to play actively, few formal neighborhoods in which children can play safely, and topographical features that prevent children from walking or riding their bikes for recreation and/or to destinations, such as play dates, stores and churches, and school (Lee et al. 2008; Yousefian et al. 2010). Rural school locations often require long bus commutes increasing daily seat (inactive) time and preventing walk/bike to school programs, and limiting access to structured physical activity programs during or after school (Hennessy et al. 2010; Walia and Leipert 2012).

RURAL PEOPLE AND RURAL PLACES

The current trend in prevention research supports a public health or social ecological approach (Stokols 1996), acknowledging the importance of individual responsibility for behavioral choices while focusing on environmental strategies to promote health behavior at broader organizational, community, and/or public policy levels. Bracht (1990:20) explained the power of communities as both representative and real in shaping individual health behaviors, “transmitting values and norms…communities establish opportunities for people to behave in some ways and avoid in others.” Rural people typically possess a strong sense of tradition and independence that creates resistance to changes, particularly those promoted or encouraged by individuals and organizations perceived as “outsiders” (Bell et al. 2000). It is common for individuals in a given community to feel distrustful of projects and programs established and operated by outside organizations (Merchant et al. 2006; Thompson et al. 2002) and this seems especially true for residents of rural areas. The relevance of these inferences for promoting physical activity and creating environments and policies that support active living in rural places has not been determined. Thus, any attempt to promote physical activity must engage the residents in the process and give adequate attention to the unique attributes of rural people as well as the physical activity environments - the rural landscapes in which they live, work, and play.

Ecological approaches are concerned with the interrelationships among people in their spatial settings and physical environment. Stokols (1996) used a social ecological model to explain how multi-level environmental elements, ranging from
household, organizational, and community environments to state and national platforms and policies, shape the health and health actions of individuals. The social ecological perspective, which specifically emphasizes the contexts in which behaviors occur, is especially well suited to model the multiple levels that influence physical activity patterns and perceptions of physical activity environments (Fein 2004). Sallis and colleagues’ (2006) ecological model of “active living” — that is a physically active lifestyle — identifies broad categories of individual and environmental factors (i.e., intrapersonal, interpersonal, organizational, natural environment, built environment, media/information environment, policy environment) that influence physical activity behavior in each of four behavioral domains (i.e., transportation, recreation, occupation, and household). Maibach, Abroms, and Marosits (2007) proposed a simplified ecological model of public health action they called the “People and Places” framework. Their framework highlights that attributes of people interact with attributes of places to influence the health, and health behaviors, of populations. Both attributes of people and places operate across multiple levels or fields of influence. Applying an adaptation of the ecologically grounded “People and Places” framework (Maibach et al. 2007), our team utilized participatory action research to engage rural residents in studying the attributes of people and attributes of places that make easier or harder active living for adults and youth in their rural communities (see Figure 1).

Our adaptation of a “People and Places” framework illustrates how relevant attributes of people interact with attributes of places across social ecological levels to inform our understanding of factors contributing to active rural communities. Attributes of people operate at individual (e.g., thoughts, feelings, skills, demographics), group (e.g., families and social networks, supportive relationships, modeling), and community (e.g., culture and norms) organization levels. Attributes of place categorized as products and amenities, physical environments, social structures and policies, and media and cultural messages, operate proximally or locally (e.g., homes, schools, worksites, neighborhoods) and distally (e.g., state, national, corporate, global).

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Community participatory action research (CPAR) is a collaborative approach that combines methods of inquiry with community capacity building and change strategies. CPAR relies on place-based methods used to address research objectives with meaningful participation by community members with a goal of improving areas of concern within the community (Israel et al. 2005). Typically, CPAR focuses
on a particular community place where people live, work, study, and congregate on a geographic scale described as “small,” such as a neighborhood or rural town. Problems are defined by the community, as are the solutions – locals are positioned as the experts in the setting. Community members are involved in all study aspects, including data collection and analyses, which results in transfer of practical knowledge and skills. Study activities are facilitated by researchers skilled in community-engaged methods who gain insights they can share more broadly. Participatory action research generates findings that people in the setting can use to build capacity, develop resources, and mitigate obstacles and thereby facilitate place-based change (Israel et al. 2005).

We were interested in learning how the attributes of rural people interact with the attributes of rural places across multiple levels to inform our understanding of rural physical activity behavioral environments. The purpose of the Partnering to Enable Active Rural Living (PEARL) Project was to partner with rural communities and work with community members to identify the environmental features as well as the personal and situational factors that support or hinder physically active lifestyles for rural residents. Two related questions were addressed:
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- How do rural people experience physical activity in their rural community place?
- How do attributes of rural people interact with attributes of place to determine the physical activity friendliness of a rural community?

Our overarching goals were to establish campus-community alliances and improve attitudes and conditions for active living in rural New Hampshire.

METHODOLOGY

The PEARL Project employed a descriptive case study design at the community level. The study, from entering the communities through dissemination of local results, was conducted over two years. Using the USDA’s definition of rural areas (John 2008), community was defined as a geographically and politically delineated rural town within a larger geographically and politically delineated rural county. Our community case study design allowed for systematic gathering of information about and with study communities to provide a resident-informed description of the physical activity friendliness of the town; where and how physical activity occurs (or does not); who among the community participates; and, what attributes of people and places may contribute to active rural lifestyles. Three communities in one county in rural New Hampshire were selected for study because of their abundant natural resources and distinctly different rural community profiles. Access to the communities was supported by the local elected officials and sector stakeholders, insiders who were identified as community leaders and expressed an interest in improving rural health opportunities. Table 1 provides demographic and other relevant characteristics for our participating rural towns selected for inclusion because of their community interest in the study topic. Letters have been assigned as identifiers in place of town names to maintain anonymity.

PEARL community members (n=208) were recruited to participate in action research from a convenience sample of year-round, full-time adult residents (21 years and over) of the three host 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. Respondents who expressed interest and provided contact information were contacted by a campus-based member of the study team who verbally invited them to participate in a project “surveying the physical activity environment” in their community to “describe the opportunities for and obstacles to living actively in rural New Hampshire.” Those who volunteered to participate
## Table 1. Demographic Profile of Participating Communities

<table>
<thead>
<tr>
<th>Community Characteristics</th>
<th>Town P</th>
<th>Town R</th>
<th>Town W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land area</td>
<td>28.2 sq. mi.</td>
<td>42.0 sq. mi.</td>
<td>48.6 sq. mi.</td>
</tr>
<tr>
<td>Population density</td>
<td>237.1 / sq. mi.</td>
<td>37.0 / sq. mi.</td>
<td>19.5 / sp. mi.</td>
</tr>
<tr>
<td>Total housing units</td>
<td>2,086</td>
<td>953</td>
<td>565</td>
</tr>
</tbody>
</table>

### Demographics

<table>
<thead>
<tr>
<th>Education (population 25 years and over)</th>
<th>Town P</th>
<th>Town R</th>
<th>Town W</th>
</tr>
</thead>
<tbody>
<tr>
<td>High school graduate or higher</td>
<td>92.4%</td>
<td>87.5%</td>
<td>90.5%</td>
</tr>
<tr>
<td>Bachelor’s degree or higher</td>
<td>36.3%</td>
<td>25.1%</td>
<td>19.5%</td>
</tr>
</tbody>
</table>

| Median household income                | $45,909 | $43,964 | $40,268 |
| Families below the poverty level       | 5.2%    | 4.5%    | 6.6%    |

### Commuting to work

<table>
<thead>
<tr>
<th>Mode</th>
<th>Town P</th>
<th>Town R</th>
<th>Town W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor vehicle</td>
<td>74.3%</td>
<td>86.0%</td>
<td>88.5%</td>
</tr>
<tr>
<td>Walking</td>
<td>19.0%</td>
<td>3.8%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Other means</td>
<td>6.7%</td>
<td>10.2%</td>
<td>7.5%</td>
</tr>
<tr>
<td>Mean travel time to work</td>
<td>19.4 mins.</td>
<td>23.7 mins.</td>
<td>29.9 mins.</td>
</tr>
<tr>
<td>Participants (n = adults, 21 years and over)</td>
<td>170</td>
<td>23</td>
<td>15</td>
</tr>
</tbody>
</table>

**NOTE:** 1 American Community Survey, 2005–2009

were enrolled as members of their community’s PEARL research team. Local PEARL research teams consisting of community residents and sector stakeholders, university faculty and students were trained to collect data using qualitative methods. Data were collected by community-based researchers using participatory photo mapping, which included direct observation and annotated field surveys,
mapping using GPS (global positioning system) technology, and photography and photo elucidation; and additionally generated during community focus groups facilitated by a campus-based researcher. In all, 31 routes were photomapped and 532 photographed features were discussed.

Collecting Data using Participatory Photomapping

Participatory photo mapping (PPM) is a mechanism for exploring and communicating people’s experience of health and place (Dennis Jr. et al. 2009). PPM is an action research tool that aims to help communities identify and address factors that affect the health of their community. This participatory method emphasizes the role of community members as authorities in local issues that affect their health. PPM is based on principles of community engagement, which are important to initiating and creating community change. For example, participation of community members is critical to adoption of new school food or physical activity standards, and creation of community gardens and neighborhood pedestrian safety, all of which can support community health (Dennis Jr. et al. 2009). Community members can use PPM findings to spearhead changes that are locally relevant and resident-informed.

The PPM method combines mapping using global positioning system (GPS) and geographic information system (GIS) technologies with photographs of features reflecting the community’s health environment. Maps and photographs document direct observations made by members of the study community as they survey the environment. Field notes explain mappers’ perceptions of the features. The observed data, maps and photographs, are further narrated during focus groups that bring together a broader community audience – residents, local organizations (i.e., youth centers, neighborhood associations, coalitions, etc.), sector stakeholders, public health practitioners, and local decision makers - to share diverse perspectives. PPM gets community people talking about their experience of the community place to build upon health protective assets and to address local health barriers. Empirical understanding is translated through the knowledge exchange process to policy and decision makers to address disparities in health access and build local capacity for community health initiatives. Although each project is unique, the overarching goal is to engage residents in action-oriented projects that promote health and healthful behaviors in their community. The premise is that if interventionists understand how people experience health where they live, we can better understand how to intervene in meaningful ways within the social ecological context (Navarro et al. 2007). PPM has been used to explore questions of neighborhood health and safety
with youth (Gaulocher 2009), homelessness with adults (Asfi and Gaulocher 2009), and aging-in-place with older adults (John and Gunter 2012). For example, one research team worked with young people recruited from local neighborhood centers and schools to identify crucial gaps in public resources, as well as influence environmental and policy changes (Dennis Jr. 2006).

Managing and Analyzing Qualitative Data

All procedures followed guidelines for involving human subjects in research established by the University’s Institutional Review Board. Provisions to protect the privacy of participating communities and anonymity of data were assured and maintained. Qualitative data from all sources were managed using NVivo 8. To address our first study question (how do rural people experience physical activity in their rural community place), each town was developed as a separate case project using a “People and Places” conceptual model. The project frame was aligned with our study question with two deductive categories: attributes of people and attributes of place. Depictions of physical activity as subjective experience from all data sources (i.e., direct observations and field notes, photographs, route maps, and focus group transcripts) were coded as attributed to people or places and assigned to either category. Data reflecting physical activity experiences were inductively coded within categories into themes and nodes within themes. The contents of qualitative data from all sources were coded by at least two members of the project team trained in qualitative research methods, analyzed using a constant comparative method at each conceptual level of influence, triangulated across multiple sources, and verified by members of the respective communities. Emergent themes and areas of meaning were examined in relationship to our theoretical framework and a grounded theory approach (Strauss and Corbin 1994) was applied in response to study question one. To address our second study question (how do attributes of rural people interact with attributes of place to determine the physical activity friendliness of a rural community), photographs and focus group narratives from all three communities were merged into a single case project. Data representing place-based physical activity supports or barriers in the community as seen (photographs) and told (narratives) by the residents were coded inductively to build our conceptual model of physical activity friendly rural New Hampshire towns.
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RESULTS AND DISCUSSION

The presentation of findings is organized into two sections and discussed by research question. The first section is subdivided according to the “People and Places” framework into two categories: Attributes of Rural People and Attributes of Rural Place. Within each category, italicized headings are used to organize concepts emerging from the data into thematic subcategories and emergent themes are presented as italicized in the text. In the second section, thematic findings from each case community are integrated into our “people and places” frame and discussed as one rural people-informed conceptual model of physical activity friendly rural places.

How do Rural People Experience Physical Activity in Their Rural Community Place?

Active rural living was operationalized as meeting the recommendations for intentional and incidental physical activity across various behavioral venues, including transportation, recreation, occupation and/or household. Thematic concepts, reflecting how attributes of people interact with attributes of place across situations and communities to either support or limit physical activity behaviors and physically active rural living, are grouped according to our framework categories: (1) Attributes of Rural People and (2) Attributes of Rural Place. Project outcomes provided information describing the attributes of people across multiple social ecological fields of place-based influence that supported active rural lifestyles.

Attributes of Rural People

At the person-level, thematic attributes emerged as factors that reinforced active rural living and were organized into two topical categories: Physically Active Self and Social Preferences and Cultural Norms. Three thematic attributes within the Physically Active Self category included a self-concept or identity as physically active, a value for and strong beliefs in the benefits of active lifestyles despite the real or perceived environmental obstacles, and possessing essential personal resources – knowledge, skills, and money - required for locally available activities. Many PEARL participants identified themselves as physically active and expressed strong beliefs and values for demonstrating a physical activity lifestyle. At the group level and in the category, Social Preferences and Cultural Norms, two themes, supportive relationships and activity networks, emerged as attributes of people that helped to reinforce and sustain active rural lifestyles. Two additional themes, community culture and normative behaviors both supported and hindered active rural lifestyles. Rural residents in each of our host communities presented...
images of their community culture that supported a physically activity lifestyle for some people while, for others, being a counterculture for active rural living.

**Physically active self.** A caveat to what may be a physical activity enabling environment is that to benefit from the physical activity experience, one must know about the opportunities, be personally equipped with interest, ability and skills, financially resourced (technical equipment is costly) and have an intrinsic value for healthy living expressed as a physically active rural lifestyle. Rural people who identified themselves as physically active, demonstrated their values for a physically active lifestyle, and expressed belief in the immediate and long term benefits of active living, found ways to regularly engage in physical activity despite the situational and environmental obstacles. A local woman explained, “I’m a cyclist - I live in Town P because it has everything I need. The bike shop is great – discounts to local bike clubs; I ride on Thursday with the ‘real women.’ I ride my bike winter and summer to destinations – shopping, work, and even the medical center. There’s a steep hill – would be harder for someone who is less active and fit.” Intrapersonal factors, such as self-efficacy, self-conceptions, beliefs and values, are among the best predictors of intentional physical activity in adults and older adults (Dishman 1990) and athletic identity positively relates to physical activity and sport participation in children and youth (Anderson et al. 2009). An identity as “physically active” develops as a personal and social self-identification process, and consequently of showing oneself to be a physically activity person (Miller, Ogletree, and Welshimer 2002). We found that rural people who self-identified as living a physically active lifestyle could photomap the environmental opportunities and obstacles to rural active living through the lens of personal experience. We also learned that although rural residents know of the environmental resources, only those that valued outdoor recreation in natural settings and had the personal resources (e.g., knowledge, skills, social support, and equipment) to engage regularly and safely in backcountry or wilderness activities, did so. Residents in each town commented that “equipment can be very expensive and there are few or no places in town to rent equipment.” One couple from Town W shared, “…it would be great to bring back the old ski hill. That would give children a [low cost] opportunity to sled during the winter – and learn to ski and snowboard.”

**Social preferences and cultural norms.** PEARL revealed a penchant for a way of life within each community that reinforced unique social preferences for people and established place-based cultural norms, which supported Bracht’s (1990) explanation of the representative and real power of communities to establish options for people to act in some scenes and avoid action in others. All of our
communities shared an inclination for conserving naturally occurring features of the community environment as a unique expression of the different community cultures. Folks could identify many naturally occurring opportunities for people to be active in their communities on “the mountain,” in “the forest,” on “the lake,” at “the bog,” on “the trails,” and at “the rocks”; each of these natural features represented an active living opportunity that had meaning unique to life in one of our case communities. For example, in Town R mention of “the rocks,” which appeared in photographs to be nothing more than a granite wall, implied a venue to be protected for local climbers and known to only insiders. Across communities, PEARL participants were also able to identify many barriers to actively living “free or die” for New Hampshire folks, including limited and costly parking fees for access to public lands, seasonal accessibility to and maintenance of trails and trailheads, public-private land use policies, and the risks (e.g., animal encounters, participating alone, no cell phone service) of participating in remote locations. Remote rural landscapes may be seen as supporting or hindering active lifestyles depending on the lens through which the resource is viewed, as one Town R resident explained, “How does three fourths of the town being forest service land effect activity? There are houses only along the roads – no developments going back. People who value that kind of activity, people who are hikers and climbers think it’s great!”

Supportive social groups and participation networks helped to reinforce and sustain active rural lifestyles. PEARL community members acknowledged the importance of social support and networks for rural health and independence in rural New Hampshire. An extensive system of well-connected trails, maintained by a network of snowmobile clubs, enables individual and group users to enjoy a variety of winter recreational activities. In fact, community attributes that supported social groups emerged as assets for active rural living, which was not captured in the work of Yousefian and others (2010), even when the feature was not representative of the physical activity culture as seen in Figure 2 and explained by a Town P resident, “…lots of people gather here – to start and finish their exercise. Bike rides depart from here, people going running meet here.” Even more, an absence of a socially supportive venue for physical activity, real or perceived, was voiced as a barrier for active rural living. In smaller rural communities like Town W, older members of the community are bussed more than 20 miles to the regional senior center for activities and services. When discussing the possibility of a community center, a PEARL focus group participant voiced concern that “[W]
Fig. 2. Social venues are “treasures” in small rural towns, “a place to gather, hangout and meet friends.” This Town P feature was recognized as “dog friendly,” a positive support for active rural living.

such a small place, there might not be enough people to support a community center in town.”

Attributes of Rural Places

At the community level, residents identified features of the rural landscape associated with enabling or hindering active living. The physical environment features were examined with respect to a rural-specific assessment tool (Yousefian et al. 2010). Place-based factors emerged locally and thematically within three categories, Physical Landscape and Location, Physical Activity Products and Services, and Community Structures and Policies, across transportation, recreation, and occupation and/or household areas.

Physical landscape and location. Each of our PEARL communities was rich with natural environment features and provided an abundance of active recreation
opportunities: hills to sled, rocks to climb, whitewater rivers to paddle, brooks and falls to swim, mountain trails and three-season roads to hike, bike, snow shoe and ski, and alpine lakes for summer water skiing and winter skating. However, by definition outdoor adventure requires a participant to possess the personal will and resources required to thrive (and sometimes survive) in remote settings, including wicked weather conditions, isolation, and animal encounters. One Town W resident shared, “How many miles of local roads have I biked? I bicycled 12 miles every day in [the city] to work. It was beautiful - along the river and FLAT [emphasized]. Is it easier to be active here or in the city? In some ways, it’s easier in the city because you are active going about your day. I also belonged to a health club in the city. Winters here are an obstacle to any activity; animals, too. Geese in the road and dogs; Paul (pseudonym) was chased by a bear while riding his bike – the bear was there with a cub. You can’t out bike a bear – but he did.”

The rural built environment presented more obstacles than opportunities for intentional and incidental active living, including lack of adequate sidewalks and bike lanes, as well as recreation and exercise facilities, which aligned with the work of Yousefian and colleagues (2010) in their measurement of rural environments for active living. In developing their tool, researchers studying active living in rural areas across six states found physical activity promoting features that existed in urban areas were largely absent in rural places. They did find that several factors emerged consistently across rural communities, including aspects of the physical, policy and programmatic environment.

Each PEARL community was different in terms of the programmatic environment, specifically access to and availability of physical activity products and services. Consistently across communities, interruptions in physical activity services, such as exercise classes, were considered situational barriers that often led to interruptions in habitual physical activity for rural people. A woman from Town W explained, “…town hall is an opportunity…they used to have exercise groups but not anymore. I would want a yoga group. It will probably start again.”

Similarities in physical activity experiences related to living in the rural wilderness and differences determined by the remoteness of community location were noted. Proximity to the state’s regional university emerged as an environmental support for physically active lifestyles with Town P (most proximal) experiencing the most support and Town W (most distal) the least. While all three communities were profuse with natural landscape features that supported physically active outdoor pursuits, built features and location differed among the case communities. In the most remote rural Town W, people had to drive twenty
minutes (in good weather) to get to another town and further to a shopping center, high school, or hospital. Some attributes of rural places that always emerged as barriers to a physically active rural lifestyle included motor vehicle dependence (and attachment) as well as lack of active transportation options, which were illustrated (see Figure 3) through transportation route maps, ground-truthed through direct observations and photographs, and explained in Town P’s focus group, “You could walk across that railroad bridge, it’s a snowmobile route in winter; but you can’t cross in summer…there are holes between the trestles and the [private] dinner train. You can walk on the green bridge – on the highway.” With no mass transit

**Figure 3.** Motor vehicle dependence as well as lack of active transportation options emerged as barriers to active rural living, are illustrated in this figure the distribution of transportation routes (dotted lines) and feature marks (larger dots). Automobile routes are indicated in red, bicycle routes are yellow, and walking routes are green. Photos provide an example of the features mapped by residents as either supports or barriers.
options, rural residents depended on personal motorized vehicles as their primary mode of transportation, including automobiles, 4-wheelers, motorcycles, and snowmobiles.

Conditions of pedestrian and bicyclist safety emerged as consistent barriers to active transportation as told by a Town W resident, “…wide shoulders were added a couple of years ago. We were on the list for a long time. Shoulders start at the bridge – the state did the bridge after a bad accident.” Figure 4 provides a cyclist’s perspective of Town P. Two of three case communities were bisected by major rural thoroughfares and all were connected via an extensive network of snowmobile trails. In winter months, some residents use their snowmobiles for transportation

**Figure 4. “Route 3 is narrow and goes right through town. Cars don’t look for bikes – cars dodging pot holes and cars dodging each other. I’ve been ‘doored’ at 20mph . . . you could ride on the sidewalk but that’s illegal. There’s a high density of cyclists in this community; if you’re an experienced rider, this place is excellent. If you are a beginner or a child, it’s not,” explained one local cyclist.**
and many for recreation, which they considered an active lifestyle choice. Consistent with the findings of Yousefian and others (2010), active transportation and active lifestyle supports included aesthetic and structural improvements to village centers, adequate and accessible year round parking in town and at trail heads, and traffic calming and pedestrian safety features. PEARL participants acknowledged supports that were consistent across communities, such as maintaining roadways and widening shoulders; improving sidewalks, cross walks, signage, and snow removal to promote walkability; and cultivating buildings and outdoor spaces like schools, sport fields, and playgrounds as physical activity resources (see Figure 5).

**Figure 5.** Despite the exclusionary message, rural residents advocated for working together to support opportunities for all. “We should work hand in hand – programs can coexist. Something should be done for the others – for the skateboarders.”
Physical activity products and services. Our communities varied in terms of accessibility, availability and affordability of physical activity products and services. Town P was larger and better resourced, host to the public regional university and adjacent to the Interstate corridor. With an aesthetic and well established village business district, a hospital, the regional high school and a peripheral commerce area, the town offered opportunities for local residents, employers and employees, and visitors from neighboring communities and afar. PEARL participants within Town P identified ski and bike shops, parks and recreation facilities and programs, resorts and spas, fitness, dance, and martial arts studios, schools and sport clubs as providing a variety of opportunities for active rural living. Interestingly, PEARL participants from the other two case communities cited depending on Town P “for all of our amenities” as a solution for a dearth of local public and private physical activity products and services (except those associated with the natural environment) and economic conditions that hindered both public and private physical activity supports. One Town R resident proclaimed, “…there just isn’t any money in the town budget for sidewalks, park improvements, or recreation programs.” Many rural residents traveled away from their town to work in larger communities, which was true for both Town R and Town W. Economies thrive when people are around and can spend their money at local shops and businesses; both Town R and Town W were home to only a handful of shops and businesses. “The money just isn’t here,” a selectmen from Town W explained.

PEARL participants in all communities acknowledged a need for more active lifestyle opportunities for children and youth. The perception is that local stakeholders and decision-makers would like to do many things for the youth in the communities, citing obstacles such as “zero organized circumstances for young people” and built physical activity environment products and services perceived as making it “dangerous for children and families to be active.” Yet, most improvements require money that is not available. Efforts to implement physical activity programs were acknowledged by rural residents; lack of resources, including personnel, for program sustainability were recognized obstacles – programs were developed and offered, and most lasted only a short while. PEARL focus group participants in each town volunteered explanations why programs and services were not sustainable, including “…the money to pay an instructor runs out, …people stop coming, …not enough participants to keep the program going.”

Community structures and policies. Rural community culture and political will emerged as an area that in the experience of rural people both supported and hindered active rural living across populations. The reality of limited public funding
and the inclinations of the elected officials to allocate (or not) resources consistently emerged as an obstacle. Within the private sector, the political will for conserving naturally occurring features of the environment, and having the natural environment available to local users but not necessarily accessible to outsiders, emerged as both supporting and hindering active rural living.

New Hampshire has a strong sport culture and school sport traditions; local people and policies protect and reserve opportunities for athletes, which can be a barrier to activity participation for youth and adults who do not identify with the sport or as sport-involved. “There’s an ‘old guard’ who works at the high school who feels strongly about the fields. There are groups in town trying to get access, to build a track around the football field,” explained a Town P parent prompted by the feature shown in Figure 5. Rural community policy makers and chambers of commerce, to promote economic growth, enacted rules that privileged one sector over another according to some PEARL participants. For example, PEARL participants collectively voiced concerns about some roads not being maintained (potholes, no shoulders, narrow bridges, etc.) and winter maintenance policies. A group of Town P residents observed, “…costs too much to clear the snow from the trailhead so cars park on the road; from the steps down to the new parking lot by the river so we just shut it (the stairwell) down in the winter.” Parents cited barriers to active rural family lifestyles as few or no sidewalks or pedestrian safety features (crosswalk and signals) in high traffic areas; promotion of automobile (in contrast to active) transportation, including on-street parking and resistance to traffic calming devices (speed bumps, circles, signage, ticketing, etc.). One Town P parent voiced her concerns, which were prompted by the Figure 6 image and echoed by others, “Signs let drivers know that kids [play] in the street – skiing or sledding but maybe 200 yards down the road…short of putting in speed bumps, it’s hard to slow down traffic.” Community structures and policies were more likely to create opportunities and obstacles for active rural living in the areas of transportation and recreation. As explained by one Town R focus group participant, “How come there aren’t better facilities – because it’s HERE (emphasized). Active recreation and exercise is considered a ‘liberal democrat’ idea. It’s a frill, not essential; it’s a luxury. A classic statement is, ‘…we didn’t have it when we were little.’ It’s all about money – taxes and spending. The rural value structure is that it would be nice if we could afford it, but we don’t need to raise taxes to have it.”

Conservation culture and “insider” tradition were reflected through rural people’s special relationship with their rural place, often acting as stewards of the land and protectors of the privacy offered by rural locale. Our findings supported
those of Bell and others that rural insiders are particularly protective of their lifestyles and landscapes from the influence of “outsiders” (Bell et al. 2000; Merchant et al. 2006; Thompson et al. 2002). Interestingly, the most remote community seemed the most welcoming to outsiders as one Town W resident explained, “Appalachian Trail crossing - we have a fair number of hikers that stop. They hike into town and use our amenities – food and post office. All the trails bring hikers…and revenue to the town. There’s a hostel up by trail crossing; I don’t know that we advertise very well.” In contrast, a typical response by PEARL participants in Town P and R to the suggestion of creating a guide book of natural amenities or trail maps was, “…we don’t want that; we don’t want everyone coming here.” Rural insiders appreciated the active recreational opportunities their rural place offered, and preferred to reserve those features for themselves.
How do Interacting Attributes of Rural People and Places Determine the Physical Activity Friendliness of a Rural Community?

Data from each community were integrated to create a model of rural New Hampshire physical activity friendliness. An activity friendly rural place was qualified consistent with Maibach and colleagues’ (2007) ecological model of public health action (see Figure 1). Activity friendliness was explained as having a variety of opportunities and few obstacles at every level and across sectors in the community that would make it easier for local people to be regularly physically active and for people from all walks of life to achieve active rural lifestyles. Project outcomes provided information describing the factors that could support health-enhancing levels of physical activity for rural people and contribute to activity friendly rural environments. Our host communities were rich with natural supports for winter and summer recreational physical activities, including walking, hiking, and ski trails, rivers and ponds, and mountain bike routes; yet, residents explained that only those who were interested in and valued these types of activities regularly used the community resources.

Regarding rural people, attributes that consistently supported active rural living included internalized expectancies and values for a healthy, active lifestyle despite the real or perceived environmental obstacles. Some folks shared their personal vision of rural life in a way that made public their beliefs and values, as well as their areas, for active rural living. One mom eloquently explained, “…thinking about the farm and living actively – raising sheep and chickens are my occupation, tending the farm is work, physical labor. My chickens lay eggs, which have to be gathered most every day. The horses are a form of active recreation - we ride on snowmobile trails and on the road. Tending the horses and dogs are a household chore. I’m trying to think about how getting food locally and enjoying farms and living a rural lifestyle helps shape the physical activity landscape and activity friendliness of our community.” Rural people who valued an active lifestyle and believed in the benefits of active living found ways – through active transportation, recreation, occupations and households – and despite limiting conditions to be physically active themselves and with others.

Regarding place, situational and structural attributes shaped perceptions of rural activity friendliness. At the situational level, diversity and proximity of organized physical activity options, groups of similarly interested others, affordable program costs, and availability of skilled, sustainable leadership for physical activity programs emerged as indicators of community activity friendliness. At the environmental level, the forested and mountainous terrain rich with natural
recreation and wilderness amenities enhanced perceptions of rural activity friendliness; categorical barriers were identified in the area of active transportation routes, availability of built environment supports and facilities for programs, and long-term support (instrumental and philosophical) for emerging opportunities. With intentional selection of our field sites, we can consider the reciprocal relationships between rural people and their place-specific environmental resources as conditions for conceptualizing the activity friendliness of rural New Hampshire communities.

Supporting the Act in Action

Our long-term goal was to establish campus-community alliances that would positively affect attitudes and conditions for active living in rural New Hampshire. Our ground-truthed model, including maps of rural physical activity opportunities and obstacles and site-specific written reports, were presented to project stakeholders, including rural residents, community coalitions, and civic leaders and policy makers. Thematic categories representing community opportunities and obstacles for active rural living emerged from different perceptions of features as supports or barriers among people and across situations. Similar to Dennis Jr. and colleagues’ (2009) findings that community participation led to locally-driven health environment and policy changes, PEARL included levels of community engagement that have supported important outcomes in each town. During Town P’s focus group, the presence of skateboarding youth on the streets and sidewalks in town was identified as a concern related to the absence of appropriate facilities. In the time since the project, a group of citizens has used their PEARL findings and organized a nonprofit enterprise to support a skateboard park. The broadly represented group did the planning, fundraising and affected the construction of a state-of-the-art public facility in the downtown area (see Figure 7). The year-round use of the park is robust and the problem of sharing sidewalks and streets between walkers, cars and boarders has been eliminated. In Town R, a local baseball club incentivized to renovate and improve a community ball field that is now safe and comfortable for players and spectators alike. The field, frequently use by adults and youth, augments the ball fields provided for children at the public school. Town W leaders were motivated to formalize use of the paved area on the town common by building the structural elements for skateboarding. It is now a popular gathering place for youth and provides appropriate adult supervision. Plans are in place to expand the elements and offer lessons and special events during the school recesses.
Figure 7. Youth skateboarding on the streets and sidewalks were a safety concern and related to the absence of appropriate facilities. In the time since the project, a broadly represented citizen group activated and organized a nonprofit enterprise to plan, fundraise, and construct a state-of-the-art public skateboard park in the downtown area. The park is maintained for use year-round and used robustly by local youth. The problem created by walkers, cyclists, drivers, and ‘boarders’ sharing sidewalks and streets has been eliminated.

Secondary to the changes in the physical and physical activity service environments in the PEARL communities, and as evidence of a growing awareness of the importance of healthy, active rural people and places, the university has established a Center for Active Living and Healthy Communities. Partnerships enabled through the PEARL project continue; others have emerged. A community-wide eco-garden project is providing opportunities for participants of all ages to join in on the physical activity of producing food, while benefitting from a better understanding of sustainable agricultural practices and improved nutrition from the
whole foods grown in the gardens. Local community partners, including elementary schools, the senior center, the food bank, and several social service organizations are collaborating on this project sustained through campus leadership and solution-focused campus-community health partnerships.

CONCLUSION

Despite some limitations, including engaging a convenience sample of local residents to participate in the action research, selecting case communities based on local interest in the project, and employing methodologies that confine generalizability, PEARL project outcomes confirmed that efforts to promote active living in rural areas must engage residents and sector partners in participatory processes, and consider how the attributes of people interact with the attributes of place when designing programs, modifying environments, and enacting policies expected to affect individual behavior. PEARL revealed person level factors that contributed to rural adults’ engagement in physical activity and willingness to work to increase opportunities and remove obstacles to active rural living for all members of the community. Additionally, PEARL contributed to a shared awareness of the roles of groups and organizations within rural communities in supporting and conveying values for healthy behaviors through sustained resourcing of programs and facilities. Finally, the PEARL project clarified how the natural and built amenities as well as policies within rural communities act as enablers, barriers, or both depending on differences among people and across situations. PEARL contributed to an emerging body of knowledge describing the activity-friendliness of rural communities and promoting active rural living to improve rural health.

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