

Barriers to and Facilitators of Walking and Bicycling to School: Formative Results From the Non-Motorized Travel Study

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Barriers to and facilitators of walking and bicycling to school were explored through 12 focus groups made up of fourth- and fifth-grade students and their parents who lived near their respective schools. The barriers and facilitators reported by parents and children generally fell into one of three categories: intrapersonal and interpersonal characteristics of parents and children, environmental characteristics of the neighborhood, and environmental and policy characteristics of the school. Findings indicate that a supportive environment is a necessary but insufficient condition to increase walking and biking to school. Initiatives to increase active school travel may need to include multiple levels of intervention to be effective.

Keywords: *travel; physical activity; focus groups*

INTRODUCTION

Population surveys consistently demonstrate that youth fail to meet recommended guidelines for physical activity (Ogden, Flegal, Carroll, & Johnson, 2002; Sallis, Prochaska, & Taylor, 2000) and that they are spending more of their leisure time in sedentary activities such as watching television and surfing the Internet (Clocksin, Watson, & Ransdell, 2002). The physical and social environments in which we live make it difficult to obtain optimal levels of activity and maintain normal weight (Ewing, Schmid, Killingsworth, Zlot, & Raudenbush, 2003; Gordon-Larsen, McMurray, & Popkin,

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This research was funded by grant ES12397 from the National Institutes of Health.

Health Education & Behavior, Vol. 35 (2): 221-244 (April 2008)

DOI: 10.1177/1090198106288794

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2000). Automobiles have become the predominant means of transportation for most families, resulting in even more sedentary behavior (Ewing et al., 2003).

Travel to and from school can be a source of physical activity added to a child's daily total energy expenditure (Tudor-Locke, Ainsworth, & Popkin, 2001). These additional minutes of physical activity may supplement other leisure-time or school-based activity and may encourage children to be more active throughout the day. A study of Filipino adolescents indicated that the difference in energy expended due to active commuting to and from school translated to an energy expenditure of 8,840 kcal/year for males and 6,640 kcal/year for females, thereby avoiding a weight gain of 2 to 3 lb/year (Tudor-Locke, Ainsworth, Adair, & Popkin, 2003). In addition, a cross-sectional study in Great Britain found that total volume of physical activity was higher for children who walked to school than for those who were driven by car (Cooper, Page, Foster, & Qahwaji, 2003). More specifically, active school travel was associated with higher levels of physical activity after school and in the evenings for boys. Despite the apparent benefits of active travel, a 2001 national transportation survey found that less than 36% of all trips to and from school were made by walking or biking, representing almost a 40% decline since 1977 (U.S. Department of Transportation, 2004). In North Carolina, the statewide prevalence of walking and bicycling to school in a typical week was, respectively, 9% and 4% among middle school students and 5% and 3% among high school students (Evenson, Huston, McMillen, Bors, & Ward, 2003).

In recognition of the benefits of active school travel, Healthy People 2010 includes two developmental objectives on transportation that focus on children walking and biking to school: Objective 22-14b calls for increasing the proportion of trips to school of 1 mile or less made by walking, and Objective 22-15b calls for increasing the proportion of trips to school of 2 miles or less made by biking (U.S. Department of Health and Human Services, 2000). To meet these objectives and increase rates of walking and biking to school, it is critical to identify factors that influence how students and parents make decisions about school travel. A recent U.S. survey of 611 households with children between the ages of 5 and 18 years old found that long distances and dangerous motor vehicle travel were the most commonly reported barriers to active travel (Centers for Disease Control and Prevention, 2002). However, that sample was not restricted to families who lived within a reasonable walking distance to school and included households with children in middle school and high school.

The purpose of this article is to describe the barriers to and facilitators of walking and biking to school as reported by parents and children who live within a 1.5-mile radius of their school. These qualitative data were collected through a series of focus group discussions with fourth- and fifth-grade students and their parents, which were designed to inform the development of an intervention to increase active travel to school for the Non-Motorized Travel (NMT) Study.

METHOD

Recruitment of Sample. Focus group participants were recruited from four elementary schools in central North Carolina with a large number of fourth- and fifth-grade students who had no access to bus service. In North Carolina, state policy defines the size of the "no bus" zone as 1.5 miles around the school, but local districts can shorten this distance (School Transportation Group, 2001). Staff at the recruited schools

identified fourth- and fifth-grade students who lived close enough to walk or bicycle to school. Multiple invitations were sent home to invite parents, with their fourth- or fifth-grade children, to participate in an evening focus group discussion to be held at their child's school. Interested parents were directed to call a toll-free number, and callers were screened over the telephone to confirm eligibility. In addition, parents were asked whether or not their child walked or bicycled to school. Children who regularly or occasionally walked or bicycled to or from school were defined as active travelers (AT), and all other eligible students were defined as non-active travelers (NAT). Parent-child pairs were registered to participate in separate parent and student focus groups held simultaneously at the child's school. Parents and children were offered a small gratuity to thank them for participating in the focus group discussions. The study protocol was approved by the University of North Carolina's School of Public Health Institutional Review Board. In addition, separate research applications were submitted to and approved by both school districts overseeing the four elementary schools.

Procedures

Separate semistructured focus group guides were developed for the parent and student AT and NAT groups. The focus group guides and protocols were developed consistent with recommended focus group methodology (Krueger, 1994). The overall NMT study was guided by the social ecological and political economy of health frameworks. These frameworks also generally informed the questions included in the focus group guides. For example, the social ecological framework (McLeroy, Bibeau, Steckler, & Glanz, 1988) recognizes that health behaviors are influenced at multiple levels: intrapersonal, interpersonal, organizational, community, and policy. Because these factors are seen to affect the decisions about walking and biking to school, questions were posed that assessed walking and biking motivations (intrapersonal level), discussions/negotiations between parents and children (interpersonal), supports available at school (organizational), and supports available within the community such as sidewalks, crossing guards, and so on (community). Focus group guides also included questions about other social determinants of walking and bicycling to school. For example, investigators examined the effect of history by asking parents whether or not they walked or bicycled to school as children as well as what positive or negative experiences they remember. Investigators also explored the effect of economics by asking parents how money factors into their decisions about school transportation. While asking these questions, we probed to uncover both facilitators of and barriers to active travel. A complete copy of the focus group guide for both parents and children is available from the principal investigator (D. S. Ward) at dward@email.unc.edu.

The focus group guides for parents and students were piloted with a convenience sample of four parents and four students prior to administration. Pilot testing showed that the questions and general format of the focus group guides were understood by participants and allowed for good discussion of numerous issues. Minor modifications were made to reorder some questions to improve the flow of discussion. All focus group discussions were led by trained and experienced moderators, were audiotaped with permission of participants, and were transcribed by a professional transcriptionist.

Separate parent and child focus groups were held in the evening at four participating elementary schools during May and June 2003. The parent focus groups lasted approximately 1.5 hours each, whereas the student focus groups lasted approximately 1 hour. Parents completed a brief questionnaire prior to focus group discussion to

collect sociodemographic information about participants. Children were asked to report current grade level. Moderators used the focus group guide to lead discussions, allowing ample time for participants to respond to questions and comments from other participants. In addition, designated observers were present to make sure the moderators did not overlook any participants trying to add comments.

Analysis and Interpretation

Transcripts of parent and student focus groups were entered into NVIVO (QSR International, 2002) qualitative software for analysis. Variable names were assigned based on content. One trained research assistant coded all of the parent and student transcripts. Text passages were printed by code and used to identify common themes as well as differences between the AT and NAT groups.

RESULTS

Sample

Thirty-seven parents and 37 children (11 NAT and 26 AT of each) participated in 12 focus groups (6 parent groups and 6 student groups). On average, children who participated in the focus groups were 10 years of age and fairly evenly split between grades 4 and 5 and by gender (48.6% boys and 48.6% girls; remainder were missing gender). Race was only assessed for parent participants, of which the majority was White (94.6%). The focus group participants were a convenience sample and thus were not representative on race from the larger school district (53.3% White) or statewide schools (59.4% White) from which they were sampled.

Major Themes

The focus group guides encouraged parents and students to discuss a variety of issues surrounding walking and biking to school, but the results included in this article will be limited to the barriers to and facilitators of active school travel identified by participants. Often, the same themes emerged under both barriers and facilitators. For example, the lack of crossing guards can represent a barrier to active travel, but the presence of crossing guards can be a facilitator. The barriers and facilitators identified generally fell into one of three categories: parent and child factors, characteristics of the physical environment, and school attributes. Sample quotes for each of the barriers and facilitators reported are presented in Table 1.

Parent and Child Factors

Parent and child factors often reflected intrapersonal- and interpersonal-level barriers and facilitators. Within these categories, four very different themes emerged: personal safety, siblings, time management, and motivation.

Personal Safety Barriers. Personal safety fears were identified by all groups as the most significant barrier to active travel. Specifically, parents feared that their child

(text continues on page 230)

Table 1. Parents' and Children's Facilitators and Barriers Related to Walking and Biking to School

Issue	Sample Quotes From Parents	Sample Quotes From Children
<i>Parent and child factors</i>		
Personal safety barriers		
Fear of child abductions	<p>“As the children get older, you think more about kidnapping. . . . By the time they're in fourth or fifth grade, they're able to cross streets and they're paying attention. But by the time they're in fourth or fifth grade, they're greater targets for kidnappers” (NAT parent).</p>	<p>“When you ride to school with them [parents], they make sure you're safe and no one can steal you” (AT child).</p>
Fear of child walking alone	<p>“In fourth grade, she [my child] went up to school by herself. I was nervous about it. Before then, we had to make sure there was always someone picking them up from school. They weren't allowed to walk by themselves” (AT parent).</p>	<p>“If you're just walking by yourself and there's no one else with you, then it's not real safe” (AT child).</p>
Lack of parental peace of mind	<p>“No working parent wants to just let their kid walk to school. They want to make sure they got to school and they're safe” (AT parent).</p>	
Fear of child being in an accident	<p>“Biking increases the probability of accidents. There's inclement weather or it's wet, it may slide” (NAT parent).</p>	<p>“The unsafe thing is that if you get hit by a car, it's not going to really matter that you don't have any sidewalks [or if] you know a person [in the neighborhood] or not; you're still going to break your arm” (AT child).</p>
Immature judgment on the part of the child	<p>“I don't trust she would make a good decision if she got in trouble. Let's say, all of a sudden, a car was right in front of you or a car was turning . . . I don't think she would react and do the right thing. I don't trust that” (NAT parent).</p>	
Bullies	<p>“It can also just be scary if the groups of middle school kids come and they're intimidating to the little kids” (AT parent).</p>	<p>“Down the path on the way to the mall . . . there's a guy who's 18 and he always shoots paintball bullets at you and it really hurts” (AT child).</p>

(Continued)

Table 1. (Continued)

Issue	Sample Quotes From Parents	Sample Quotes From Children
<p>Personal safety facilitators Someone to accompany child</p>	<p>“If I see more kids on the road walking to school, I would feel more comfortable with my kids walking and joining them. If my kids are the only ones walking, I feel uncomfortable” (NAT parent).</p>	<p>“When I walk I’ve got a parent with me. I feel safe” (AT child).</p>
<p>Early notification system</p>	<p>“One of the things that I’m very impressed [with] is that teachers have a telephone in the class. And when one of my children has not gone to school for some reason, right away they call you at home. So there’s always a check there” (NAT parent).</p>	<p>“My brother gets driven to school because our schools are at separate times. When my mom gets home, she doesn’t have enough time to walk” (AT child). “My friends live in the neighborhood and if I don’t walk with them, I usually walk with my little brother” (AT child).</p>
<p>Sibling barriers</p>	<p>“I have a second grader that is too young to walk, but I’m not going to let my fifth grader walk and then me have to drive my second grader” (NAT parent).</p>	<p>“My brother gets driven to school because our schools are at separate times. When my mom gets home, she doesn’t have enough time to walk” (AT child). “My friends live in the neighborhood and if I don’t walk with them, I usually walk with my little brother” (AT child).</p>
<p>Sibling facilitators</p>	<p>“I think siblings make a big difference. I’ve got a fourth grader but I have a first grader who is probably equally as responsible as the fourth grader, but I wouldn’t let the first grader walk home by himself. So it’s nice that they can kind of help each other” (AT parent).</p>	<p>“My brother gets driven to school because our schools are at separate times. When my mom gets home, she doesn’t have enough time to walk” (AT child). “My friends live in the neighborhood and if I don’t walk with them, I usually walk with my little brother” (AT child).</p>
<p>Time management barriers Inflexible work schedules</p>	<p>“When I was working, I couldn’t let my kids walk to school. Now I take them to school because I walk with them. I think for working parents it’s really hard to have their kids walk to school” (AT parent).</p>	<p>“At our school, there are these kids that take the early bus because their parents have to work and they can’t really walk. And they’re close enough” (AT child).</p>
<p>Not enough time in the mornings</p>	<p>“My daughter would have to get up earlier. Our mornings are like a tornado as it is” (NAT parent).</p>	<p>“I don’t like to walk or bike in the morning because I’m not a morning person. I don’t like to wake up. I usually don’t have a lot of energy in the morning” (NAT child).</p>
<p>Convenience of driving</p>	<p>“People are in a hurry everywhere they go, and a lot of people think it saves time if they drop the child off and head off to wherever they’re going” (AT parent).</p>	<p>“I don’t like to walk or bike in the morning because I’m not a morning person. I don’t like to wake up. I usually don’t have a lot of energy in the morning” (NAT child).</p>

(Continued)

Table 1. (Continued)

Issue	Sample Quotes From Parents	Sample Quotes From Children
Time management facilitators	<p>“If the work place would allow parents once or twice a week to come later . . . would they be willing to encourage their employees to spend time with children and walk them to school and talk to them and so on, or not? That would be a way to handle the problem of walking alone” (NAT parent).</p> <p>“It takes extra motivation to get up a few minutes earlier to get everything done in time to take that nice little walk to school. That takes effort” (AT parent).</p>	<p>“I don’t like to walk or bike because it takes a lot of energy” (NAT child).</p>
Motivation barriers	<p>“We looked to move to a place where it’s close enough to walk to school because the exercise is an important component” (AT parent).</p>	<p>“I think exercising is important. Walking to school is good for your legs and builds strong muscles” (AT child).</p>
Motivation facilitators	<p>“One of the reasons why I do encourage my children to walk and that we moved where we did was because I wanted to teach them independence. . . . Everyone has to learn to get themselves ready to go and make the effort to get up earlier to do it” (AT parent).</p>	<p>“They might like it because it’s good exercise and it might be a beautiful morning and you can walk to school and get fresh air. When you’re walking, it kind of boosts you up and makes you more energized through the day instead of being tired and getting up and getting in the car, and not doing anything” (NAT child).</p>
<p>Perceived benefits of walking or biking to school</p> <p><i>Characteristics of the physical environment</i></p>	<p>“From my house, my child, if he stayed on the sidewalks, he’d have to cross over that street to get on the next sidewalk. He would go up to the next street. He would have to cross over that street to get on the next sidewalk. Then cross over the street again to get on the sidewalk closest to the school. So he would be crossing that street two times to stay on the sidewalk, with no crossing guard on that street. There are too many cars” (NAT parent).</p>	<p>“I think there should be sidewalks in the neighborhood because . . . it wouldn’t be that safe to run in the road and you wouldn’t have to worry about the cars not being able to see you” (AT child).</p>
Lack of adequate sidewalks	<p>“From my house, my child, if he stayed on the sidewalks, he’d have to cross over that street to get on the next sidewalk. He would go up to the next street. He would have to cross over that street to get on the next sidewalk. Then cross over the street again to get on the sidewalk closest to the school. So he would be crossing that street two times to stay on the sidewalk, with no crossing guard on that street. There are too many cars” (NAT parent).</p>	<p>“I think there should be sidewalks in the neighborhood because . . . it wouldn’t be that safe to run in the road and you wouldn’t have to worry about the cars not being able to see you” (AT child).</p>

(Continued)

Table 1. (Continued)

Issue	Sample Quotes From Parents	Sample Quotes From Children
Weather	<p>“If it is really cold or really hot, they tend to complain about it [walking to school]” (AT parent).</p>	<p>“Well, I sort of want to walk home. But, if it’s a really hot day, I don’t want to do it. If it’s raining or anything like that, I’ll go. I like rain and snow” (NAT child).</p>
Distance	<p>“We’re almost a mile away and I just think that’s too far to walk for a child, to have to do it there and home. It’s just a really long walk” (NAT parent).</p>	<p>“I don’t like walking home. It’s kind of far away and it’s really hot” (NAT child).</p>
Terrain	<p>“My daughter also expresses a wish to be able to ride her bike to school. But there are hills. There’s a sharp turn” (NAT parent).</p>	<p>“I see a lot of people walking but I don’t see people biking because our street is like a hill. It’s like all the way down and all the way up. So on the way to school, you’d have to bike all the way down and you’d be going really fast and then you’d have to slow down really quick to turn. And then it would take a lot of effort to get up the hill coming back from school” (AT child).</p>
Traffic	<p>“Given all the potential risks [to walking] that would really matter, I think it’s probably traffic I would worry about” (AT parent).</p>	<p>“When you bike to school, you have to go through a neighborhood because if you go on the road there’s way too much traffic. You’re constantly being passed by cars. I’m afraid that one of those times you’re going to swerve right into the road and get hit” (AT child).</p>
Environmental facilitators Adequate sidewalks	<p>“For me it would definitely be some sort of sidewalk or extremely wide street, some safe area for the child to walk or bike. That to me is the number one [facilitator] because otherwise they’re just sitting ducks” (AT parent).</p>	

(Continued)

Table 1. (Continued)

Issue	Sample Quotes From Parents	Sample Quotes From Children
Proximity to school		<p>“I just walk to school because I find it rather pointless to take the bus, or take the car or carpool or something like that, because I live right across the street and it’s not a long walk” (AT child).</p>
Good weather	<p>“My kids right now just want to walk because the weather is nice” (NAT parent).</p>	
<i>School attributes</i>		
School-related barriers		
School policies	<p>“My kids wanted to ride their scooters but they weren’t allowed” (NAT parent). “They don’t let the bikers leave until all the buses are gone. And then they will allow the bikers to go. They hold these kids up. I think the bikers get to go [first] and then they let the walkers go” (NAT parent).</p>	<p>“If school started later, you wouldn’t be tired when you woke up” (AT child).</p>
Crossing guards	<p>“I know in our situation, she would have to cross what I consider to be a very busy street and there’s no crossing guard there. . . . There’s no one on the street where I live, in the section I live, that lets their kids walk. . . . There’s a crossing guard in the other direction, so there may be more walkers on that end” (NAT parent).</p>	<p>“I am usually allowed to walk. But if I go early for safety [patrol], I can’t walk then because there’s no crossing guard” (AT child).</p>
School-related facilitators		
Crossing guards	<p>“He [the crossing guard] helps them cross and he’s also aware of the fact if someone stops. So that deters somebody from stopping and hanging out looking for kids, or whatever. That’s adult supervision” (AT parent).</p>	<p>“I feel safe because at the most busiest road that we cross . . . there’s a crossing guard” (AT child).</p>
Heavy school traffic	<p>“They have to sit in that [car drop-off] line and it’s a long line, and they just hate it, they hate it. They could almost be from house to school in the time that they actually sit in that car rider line. . . . But, they can’t wait until next year when they can start walking again” (AT parent).</p>	

NOTE: AT = active traveler; NAT = non-active traveler.

would be abducted while walking or biking to or from school. Many closely related issues arose during parent and student focus group discussions, such as concern about walking to school alone, especially through secluded areas, and especially in the mornings because there were fewer walkers around. Parents also reported that lack of peace of mind was a barrier, explaining that they felt uncomfortable allowing their children to walk to school alone or with friends and then going to work without knowing whether or not their child arrived at school safely.

Child abductions were specifically mentioned in both AT and NAT groups. Some NAT parents discussed areas along their child's route to school that they perceived as particularly dangerous, where their children could be abducted, as illustrated by this parent:

I was just thinking about that place. . . . That's like a perfect place for a predator to sit and wait for your child . . . by the time you get that far away from school, there's not that many kids walking together. . . . And I have thought about my kid walking home and walking through there and getting snatched right there, because it would just be so easy.

AT parents admitted that crime was on their minds, but they also appeared to acknowledge that it was impossible to guard a child every second. One AT parent explained, "Well, statistically an awful lot of kids are kidnapped by people they know. . . . It's just not something I can allow myself to worry about."

Although fear of child abductions was the issue that arose most frequently, parents and children did report other issues related to personal safety. Parents and children both reported concerns about being in an accident and the presence of bullies. In addition, parents were concerned about a child's immature judgment. Accidents were mentioned by NAT parents (but not by AT parents) and by AT and NAT children. These groups were particularly concerned about accidents occurring while biking, with some parents claiming that biking increases the probability of accidents and students recounting numerous bicycle accidents. This is not to say accidents were not a concern for AT parents, but this topic did not arise during those group discussions. Both AT and NAT parents expressed concern about immature judgment on the part of their children, specifically about children's ability to follow traffic rules and their ability to make good split-second decisions. Last, both AT and NAT parents expressed concern over the potential for bullies, whereas children gave more specific examples of older children or teens that they had encountered.

Personal Safety Facilitators. Two personal safety facilitators were mentioned repeatedly in both parent and student groups. First, having someone to accompany the child was identified as a facilitator because it would allay parents' concerns about child abductions and other personal safety fears. That "someone" could be a parent, another adult, a friend, or a sibling. Second, an early notification system was identified as a facilitator because it would provide peace of mind to parents. This system would require that the school alert the parent if the child did not show up at school. One AT parent described how this system could facilitate active travel: "If I know for 100% sure that if I send my kid off to school and that if he doesn't show up at school, that I get a call from the teacher. If I know that, then I feel pretty OK that within 15 or 20 minutes I'll know that he disappeared and that we'll maybe have a chance of finding him."

Sibling Barriers. A second theme that emerged within parent and child factors was sibling issues. Siblings were often identified as a barrier to walking and biking to school

by both parents and children. Parents reported that even for those who stay at home, it may be more convenient to drive their child because other children in the household attend different schools and must be driven. Parents also reported that having young children who require naps at the times school starts or ends (or who are too old for strollers but too young to walk on their own) can make walking inconvenient.

Students identified other reasons that siblings were a barrier. Some children did not want younger siblings tagging along as they walked or bicycled to school. Others complained that their younger siblings could not keep up, even if a parent came along. And several realized that when their siblings had to be driven to a different school, there was no longer time for the parent to walk with them.

Sibling Facilitators. Although younger siblings were often identified as a barrier, older siblings can facilitate active travel because they provide someone to accompany the younger child when walking to school. The importance of having someone to walk with the child was noted earlier under personal safety facilitators. As one parent explained, “I think siblings make a big difference. I’ve got a fourth grader but I have a first grader who’s probably equally as responsible as the fourth grader, but I wouldn’t let a first grader walk home by himself. So it’s nice that they can kind of help each other.”

Time Management Barriers. Time management was another theme that emerged. Inflexible parent work schedules (particularly in situations in which all adults in the household worked outside the home) were seen as a major barrier to active school travel because such schedules prevented parents from monitoring children’s safety. A parent in one of the AT groups described how her work schedule had affected her children’s mode of travel to school: “When I was working, I couldn’t let my kids walk to school. Now I take them to school because I walk with them. I think for working parents it’s really hard to have their kids walk to school.”

NAT and AT parents frequently mentioned chaotic mornings and the convenience of driving (especially when the weather is bad) as barriers to walking and biking to school. Some parents expressed that it was more convenient to drive when the parent is on their way to work or needs to run other errands, or if the family is running late in the morning.

Similarly, students reported not having enough time as a barrier to active travel, primarily in the morning. Several children complained that it took longer to walk or bicycle to school than to be driven, which in turn would require them to get up earlier in the morning.

Time Management Facilitators. A facilitator mentioned by many parents that addressed both time management and personal safety was flexible parent work schedules, which allowed parents to walk or bicycle with their child to or from school. In fact, AT parents said that having a flexible work schedule was the most important factor that enabled them to allow their children to walk or bicycle to or from school.

Motivation Barriers. The final category of parent and child factors illustrates how not having the energy, strength, or motivation can be a barrier to active travel. AT parents pointed out that it took effort to get up, get organized, and get out the door on time; therefore, lack of parent motivation was seen as a barrier to children’s active school travel. According to these AT parents, parents whose children walk or bicycle to or from school are committed to encouraging that activity, and a lack of motivation can be a barrier to making that happen. Other motivation barriers that arose included the

time and effort required to dress for extreme weather, child fatigue (especially in the afternoons and in hot weather), and the heavy backpacks students have to carry.

Motivation Facilitators. Parents and students also identified numerous benefits of active travel that would provide motivation to use active travel and thereby facilitate this behavior. For example, parent motivation for the child to engage in regular exercise was described as a facilitator. Several AT parents commented that they had chosen their home for its proximity to school so that their children could get the exercise of walking or biking to and from school. Other perceived benefits listed by AT parents were enjoying quality time with their child, allowing the child more time outdoors, supporting the environment by not using an automobile for a short trip, teaching their child independence, and/or providing exercise for the child, the parent, or both. Parent motivation did not arise during NAT discussion groups.

Characteristics of the Physical Environment

Parent and child factors listed above primarily reflect the intrapersonal- and interpersonal-level issues related to walking and biking to school. Community-level issues were raised during discussions, primarily characteristics of the physical environment that may serve as either barriers or facilitators of active travel to school.

Environmental Barriers. In all of the focus groups (parent and student; AT and NAT groups), participants reported barriers in the physical environment that discouraged the use of active travel: lack of sidewalks, weather, distance, terrain, and traffic. Lack of sidewalks or discontinuous sidewalks were seen as a barrier because they made walking to school more dangerous. Discontinuous sidewalks forced a child to cross the street repeatedly to walk on a sidewalk; often, these additional crossings lacked adequate adult supervision (such as crossing guards). Parents mentioned all types of inclement weather (heat, rain, and cold) as barriers, but children did not seem to mind being cold or getting wet. They did, however, complain about having to walk or ride their bicycles in hot weather. Distance was reported as a problem for several participants, despite the fact that they all lived within a mile and a half of school. Hilly terrain further complicated the distance barrier. Both parents and children noted that hilly terrain was more of a barrier for biking than for walking. An AT parent expressed the concern that terrain can encourage a child to take a less safe route to or from school. Children pointed out that hills test their biking skills and can therefore be dangerous.

The specific concerns raised by parents and children with regard to traffic were heavy traffic in the neighborhoods, inconsiderate drivers, busy intersections, and unorganized bus and car drop-off/pick-up zones. Parents and children were concerned about the number of cars driving through the neighborhood as well as drivers who were not mindful of children on their way to school. This sentiment is captured well in one child's statement: "I don't really think it's safe because in my neighborhood there's a lot of vehicles and they don't look out for kids when they're driving." Parents and children also complained of busy intersections that children walking to school had to cross. Bus and car drop-off/pick-up zones were also a concern as one AT parent explained: "Buses make it [the street in front of the school] incredibly dangerous . . . [and] the parents that come in and drop their kids off, they'll go around other cars, they'll pull out in front of cars. It's absolutely nuts the way people behave."

Parents identified additional barriers in the physical environment, including obstacles in the road that prevent clear vision (such as trashcans out on the curb on trash day or vegetation that is not trimmed), darkness in the morning at certain times of the year, the lack of biking support in the community and at school (such as bicycle lanes, bicycle stands, helmet storage, and dry storage), and secluded areas on the way to/from school where the child cannot be observed.

Environmental Facilitators. Short distance from school, more adequate sidewalks, and good weather were facilitators of active school travel reported by AT and NAT parents, as well as AT students. Neighborhood routes that avoid main roads were also reported as a facilitator of active school travel, but NAT parents were concerned about routes that would lead the child through secluded areas. Several AT parents suggested that prescribing the exact routes for their children to use might facilitate active school travel.

School Attributes

Thus far, the issues raised have related to individual, interpersonal, and environmental factors related to active school travel. The school attributes category reflects the barriers and facilitators of active travel at organizational, community, and policy levels.

School-Related Barriers. One of the most frequently mentioned school-related barriers was the early start time in the morning (ranging from 7:30 a.m. to 7:50 a.m.). Some NAT parents noted that their children would rather sleep an extra 10 to 15 minutes than get up early enough to walk to school. Early school start times were particularly a problem when it was dark in the morning, thus making walking and biking to school more dangerous. Some of the parents in the NAT groups reported many other school policies that discouraged walking and biking. One school had made a policy change that required parents to designate their child as a rider or a walker, which made it very difficult for children to walk home some days but not others. As one parent explained, "I think they [the school] discourage [walking], especially when they made that rule change. You can't suddenly decide that hey, it's a nice sunny day and I'm going to go and not car ride, but pick them up by walking. To me, I felt like they had tied my hands more." Other school policies that were barriers to active travel included grade/age minimums for walking and bicycle riding, rules against riding push scooters to and from school, and policies requiring bicyclists and walkers to wait to be dismissed until after the car riders leave.

Crossing guards were considered by parents and some students as an important safety feature, and their absence was considered a barrier. One NAT mother described why she might not allow her daughter to walk to school:

I know in our situation, she would have to cross what I consider to be a very busy street and there's no crossing guard there. . . . There's no one on the street where I live, in the section I live, that lets their kids walk. . . . There's a crossing guard in the other direction, so there may be more walkers on that end.

Another barrier was lack of storage space at school for coats and bicycle helmets. One AT mother explained, "If you walk in inclement weather, you get here drenched or

you wear thick jackets. They don't really have the space to put their jackets to dry." Several parents reported that lack of storage space for bicycle helmets discouraged their children from riding their bicycles to school.

School-Related Facilitators. Crossing guards were mentioned by many AT parents and AT children as facilitators of active school travel. In some schools, crossing guards are beloved school safety personnel and make the child's walk or bicycle ride to or from school a more pleasant experience. Parents took comfort in the fact that their school's crossing guard looked out for their children going to and coming home from school. Even though heavy school traffic was often viewed as a barrier to active school travel, in some ways it was also viewed as a facilitator. An extremely long wait in the drop-off/pick-up car queue can encourage active travel to school. As one parent explained, "At [our school] . . . if you don't ride the bus and you're picking your kids up in a car, the line is so long that we could be home by the time people get through that car circle."

DISCUSSION

The results of these focus group discussions illuminate factors involved in school travel decisions among fourth- and fifth-grade students and their parents who live close enough to walk or bicycle to school. The principal finding of this study is that a supportive physical environment (including sidewalks and safe pathways/routes to school) is a necessary but insufficient condition to encourage active travel to school. Fear of child abduction was the number one barrier identified by parents and children, but many other factors, including the flexibility of parent work schedules, parent motivation, and the physical load students must carry to and from school, also influence parents' decisions about whether or not children walk or bicycle to school. Parents of NAT students appeared to express a strong fear of child abduction. Like their parents, NAT students appeared to have a heightened sense of awareness and concern about the potential for abduction.

The results of the focus group discussions also demonstrate that, consistent with ecological thinking, there are multiple levels of influence on active travel decisions and that multilevel intervention strategies are needed if we are to reach the active school travel goals outlined in the Healthy People 2010 objectives (U.S. Department of Health and Human Services, 2000). To further illustrate this point, we offer Tables 2 through 4 to highlight potential intervention strategies that could be used to address these multilevel barriers. Some of these strategies arose from the focus group discussions and others were drawn from resources in the literature. These ideas are intended to serve as a starting point for creating and researching future interventions promoting active school travel. Table 2 lists intrapersonal- and interpersonal-level barriers to active school travel and possible interventions at different levels consistent with the social ecological framework: intrapersonal, interpersonal, organizational, and community/environmental (McLeroy et al., 1988). Similarly, Table 3 lists organizational- and community-level barriers, and Table 4 lists policy-level barriers. Although fear of child abduction emerged as a key concern, our results are generally consistent with findings of a recent Australian study of adults that concluded that individual, social environmental, and physical environmental determinants of walking were of approximately equal importance (Giles-Corti & Donovan, 2003).

Intrapersonal- and Interpersonal-Level Barriers (Table 2)

Fear of child abduction emerged as a high priority barrier at the intrapersonal level for parents and for children. It has long been known that parents' fears restrict the travel of children (Holme & Massie, 1970; Van Vliet, 1983). A 1987 U.S. telephone survey of parents who have at least one child younger than 13 years of age revealed that, compared to the real potential for injury based on actual injury rates, parents were overly concerned about child abduction by strangers and knew relatively little about the dangers of pedestrian and bicycle injuries (Eichelberger, Gotschall, Feely, Harstad, & Bowman, 1990). The actual risks of abduction overall are substantially lower than risks of injury from automobile accidents, drowning, burns, pedestrian injuries, and bicycle injuries (Eichelberger et al., 1990; National Center for Injury Prevention and Control & Office of Statistics and Programming, 2001).

Barriers identified by parents that were closely related to the fear of child abduction were fear of the child walking alone and lack of parental peace of mind. It is not surprising, for children of this age, that the results of this study revealed that students' level of concern about these issues roughly mirrored that of their parents. In the focus group discussions, parents reported dealing with these concerns by (a) not allowing their child to walk and driving them to school instead, (b) walking with their child to school, or (c) prescribing exact routes their child must take to or from school.

The parent and student group discussions generated additional intervention strategies for dealing with these personal safety barriers. One intervention strategy that addresses these fears is the "walking schoolbus." This program organizes routes for groups of children to use to walk together to or from school, accompanied by one or more adults. This program is being used successfully in the intervention study that resulted from this formative research. A second intervention strategy that would help address these fears is an early notification system. Immediate reporting of student absence by the school to the parent also appeared to relieve parent anxiety about abduction and create parental peace of mind that the child arrived at school safely. A third strategy would be to encourage employers to allow parents to have more flexible work schedules.

Beyond personal safety fears, the other key intrapersonal-level barrier faced by children that holds promise for intervention is reducing the load that students carry to and from school. This can be accomplished by purchasing a duplicate set of textbooks that can be left at home during the school year or by converting from paper text to electronic. This is not only an issue for children walking or biking to and from school, because it also affects children walking to and from schoolbus stops, walking within school, and walking from the carpool or bus lane to school and back (Chansirinukor, Wilson, Grimmer, & Dansie, 2001; Mackenzie, Sampath, Kruse, & Sheir-Neiss, 2003). Given school budget constraints, PTA fundraising and parent and alumni donation programs may offer the most feasible options for purchasing duplicate textbooks or converting to electronic text.

Two barriers arose during discussions that represent interpersonal-level issues within the ecologic framework: siblings and bullies. In addition to addressing the intrapersonal-level barrier of personal safety fears, a walking schoolbus program has the potential to address these interpersonal-level barriers as well. Students whose parents must transport other children to or from different schools could join an adult-supervised walking schoolbus to or from school, as could students who prefer not to walk with their siblings. Walking with a group of children supervised by an adult minimizes any threats from bullies, as well as addresses a number of the safety concerns noted above.

Table 2. Multiple-Level Interventions to Address Intrapersonal- and Interpersonal-Level Barriers to Active School Travel

Barrier	Intervention Level	Possible Intervention Strategy
Fear of child abduction	intrapersonal	provide information in school newsletter and through other school venues on actual risk of child abduction
	interpersonal	encourage parents to walk/bike with children to school
	organizational	offer a walking schoolbus program
Lack of parental peace of mind	intrapersonal	provide information in school newsletter and through other school venues on actual risk of child abduction
	interpersonal	encourage parents to walk/bike with children to school
	organizational	notify parents immediately if the child is not in school when the morning bell rings
Inflexible parent work schedules	intrapersonal	provide information to parents on how to negotiate for flexible work schedules
	organizational	offer walking schoolbus program
	community	encourage major area employers to offer flexible start times so that parents can walk with children to school
Lack of parent motivation	intrapersonal	provide information in school newsletter and through other school venues on the value of active school travel for increasing physical activity
	interpersonal	encourage students to ask their parents for permission to walk/bike to school
	organizational	offer a tracking and reward/recognition program for student walkers
Load that students must carry	organizational	purchase duplicate textbooks for use by active travelers

(Continued)

Table 2. (continued)

Barrier	Intervention Level	Possible Intervention Strategy
Child fatigue	policy	require and fund schools to provide enough duplicate textbooks for students who live within a 1.5-mile radius of the school
	interpersonal	encourage parents of active travelers to pack an additional snack for their child to eat at the end of the school day before walking home
	organizational	provide a small snack to walkers before leaving school in the afternoon
Not having enough time to walk or bike	organizational	offer a tracking and reward/recognition program for student walkers
Immaturity	policy	review necessity of early school start times
	interpersonal	encourage parents to walk/bike with children to school
Inadequate outer garments in cold or wet weather	organizational	offer a walking schoolbus program
	intrapersonal	provide information in school newsletter and through other school venues on need for outer garments in cold/wet weather
Sibling issues	organizational	offer walking schoolbus program
Child walking alone	interpersonal	encourage parents to walk/bike with children to school
	organizational	offer a walking schoolbus program
Bullies	interpersonal	encourage parents to walk/bike with children to school
	organizational	offer walking schoolbus program

Organizational and Community-Level Barriers (Table 3)

Other opportunities for reducing barriers to active school travel can be created at the organizational and community levels of the ecological framework. At the organizational level, there appears to be a number of actions that schools can take to address barriers

Table 3. Multiple-Level Interventions to Address Organizational- and Community-Level Barriers to Active School Travel

Barrier	Intervention Level	Possible Intervention Strategy
School start time	policy	review necessity of early school start times
Heavy school traffic	organizational	add crossing guards
	organizational	encourage parents of students eligible for bus service not to drive their child to school, but to have their child take the bus
	organizational	encourage students who live near school to walk or bike by having various year-round promotions (offering a tracking and reward program, Walking Wednesdays, walking schoolbus programs, and other activities)
	community/environmental	add traffic calming devices, pedestrian walk signs, traffic lights, and flashing lights for the school zone signs
Lack of crossing guards	organizational	add crossing guards
Lack of storage space for coats and helmets	organizational	create specific storage space for coats and helmets
School rules	organizational	review school rules to ensure that they support safe, active travel to and from school
Lack of sidewalks/ discontinuous sidewalks	organizational	offer walking schoolbus program
	community/environmental	incorporate in the master transportation plan addition of sidewalks within 1.5 miles of schools and ongoing sidewalk maintenance
	policy	require developers to include adequate and continuous sidewalk structure in new developments
Traffic and busy roads	organization	offer walking schoolbus program
	community/environment	visible law enforcement monitoring at arrival and dismissal times
Terrain	organizational	identify safe routes to school that minimize terrain issues

(Continued)

Table 3. (continued)

Barrier	Intervention Level	Possible Intervention Strategy
Obstacles in the road	organizational	offer walking schoolbus program
	interpersonal	encourage parents to walk/bike with children to school
Darkness in the morning	organizational	offer walking schoolbus program
	interpersonal	encourage parents to walk/bike with children to school
Lack of biking infrastructure	organizational	offer walking schoolbus program
	policy	review necessity of early school start times
	community/environmental	include adequate biking infrastructure within 1.5 miles of schools in master transportation plan
Route to school has secluded areas	interpersonal	encourage parents to walk/bike with children to school
	organizational	offer walking schoolbus program
	organizational	identify safe routes to school that minimize secluded areas

to active travel identified in the focus group discussions. Comments from student and parent focus group participants indicated that organizational-level interventions such as adding crossing guards, making storage space available for coats, helmets, and bicycles, and making school rules more flexible to accommodate walkers and bicyclists could encourage more parents to support active school travel. Schools may be reluctant to address active school travel issues due to liability concerns or simply because not all students are able to walk or bicycle to school. However, ignoring the issue may exacerbate the heavy school traffic reported by parents and students in all of the focus group discussions that was identified as a real barrier to active travel as well as a daily hassle for the entire school community and surrounding neighborhood. McMillan (2005) has reported that the streets closest to the school are some of the most dangerous locations for children who travel to school on foot due to high traffic volume at school arrival/dismissal times and because of the erratic driving behavior of parents intent on getting to work or other destinations on time (McMillan, 2005). For example, 24% of motor vehicles in school zones and residential areas did not come to a complete stop even at intersections with marked crosswalks where pedestrians were crossing (Cody & Hanley, 2003). Because children who live within walking distance of school are often not eligible for bus service, they are driven by car if they do not walk or bicycle to/from school, compounding the traffic problem.

At the community level, several modifiable barriers to active travel in the physical environment surfaced in the focus group discussions, such as lack of continuous sidewalks and lack of infrastructure for bicyclists (e.g., bicycle lanes, bicycle racks, and helmet storage). Parents reported that improving infrastructure would help facilitate walking and bicycling. In addition, having neighborhood routes that allow children to avoid walking and bicycling along main arterials would also serve as a facilitator. Urban planners have found that factors such as block size, sidewalk length and continuity, route directness, access to green space, attractive streetscapes, and mixed land use are positively correlated with active travel (Giles-Corti & Donovan, 2003; Kitamura, Mokhtarian, & Daidet, 1997; Moudon, Hess, Snyder, & Stanilov, 1997; Saelens, Sallis, & Frank, 2003; Wendel-Vos et al., 2004). However, several urban planning studies that have attempted to examine the relative influence of elements of the physical environment compared to attitudes or perceptions have found that attitudes or perceptions are more strongly associated with travel behaviors than are elements of the physical environment (Giles-Corti & Donovan, 2002, 2003; Kitamura et al., 1997; Moudon et al., 1997). Changes to the physical environment, such as adding or improving sidewalks, adding bicycle lanes, and using traffic calming measures, are attractive because they improve the active travel infrastructure.

Our results confirm the findings of urban planning studies indicating that access to a supportive physical environment is a necessary but not sufficient condition for increasing active travel. Although focus groups for this study were drawn from the same school catchment areas, NAT parents found other reasons for not allowing their children to walk or bike to school.

Policy-Level Barriers (Table 4)

Parents in these focus groups noted many school policies that were perceived as barriers to walking and biking, such as early school start times, required designation of their child as a walker or car rider at the beginning of the year, and later dismissal times for children who walk or bicycle home from school. A careful review of these school practices could highlight possible policy changes in support of walking and biking to school. Parents also mentioned several district policy barriers, such as school assignment decisions that have in some cases eliminated the reality of neighborhood elementary schools. Parents also described poor school siting decisions, in which new school sites are selected that are inaccessible by walking and biking. Parents believe that developers should be required by law to include sidewalks, greenways, and crosswalks in neighborhoods to improve the active travel infrastructure. Recent publications have attempted to draw attention to these issues at the state and national levels (U.S. Environmental Protection Agency, 2003).

Strengths and Limitations

The principal strengths of this study are that it (a) included only those students and parents who lived within a reasonable active commuting distance from school in an area judged by the respective school district to be walkable; (b) included the opinions, attitudes, and beliefs of both students who walk or bicycle to school and their parents as well as students who do not walk or bicycle to school and their parents; and (c) gathered student opinions directly instead of relying on parent reports. An additional strength of this research is the use of qualitative methods that allow us to uncover rich detail enabling a full exploration of the determinants of active school travel.

Table 4. Possible Intervention Strategies for Policy-Level Barriers to Active School Travel

Barrier	Intervention Level	Possible Intervention	Responsible Group or Organization
Busing for racial equity	policy	examine ways to re-create neighborhood schools and achieve racial equity	school district and/or legislative body
School siting issues	policy	require that new schools be walkable from current and/or planned neighborhoods	school district, municipality, and/or legislative body
Lack of developer requirements to install sidewalks and greenways	policy	require developers to install continuous sidewalks in new developments and to provide links to current or future greenways	local municipality

An important limitation is the potential lack of representativeness of the focus group sample to the larger schools from which they were drawn, and the associated limits on the generalizability of these results. The focus group participants were a convenience sample recruited from two North Carolina school districts of similar size, with similar geographic and demographic features, and although participants were similar on age and school grades represented, focus group participants were more likely to be White and not eligible for free or reduced lunch than were non-focus group participants who attended these same schools. As a result, the focus group participants are not representative of the schools they are drawn from on race and income, so caution in generalizing these findings is warranted. In addition, because these schools are located in communities that are relatively advantaged with regard to income, the barriers and facilitators experienced by individuals in lower socioeconomic schools/communities may be different from those reported by participants in these focus group sessions. Although the recruitment process was blind to economic, racial, and ethnic background, it is also true that few non-Whites participated in the focus group sessions. Even though focus group participants were predominantly White and from higher income brackets, the barriers reported by these parents remain consistent with those reported by larger studies with nationally representative samples like the CDC's ConsumerStyles survey (Martin & Carlson, 2005).

A second limitation is the inability to quantify and compare results between AT and NAT groups. Focus groups are intended to gather information and allow themes to arise naturally from discussions and group interactions. Although the social ecological framework helped shape the focus group guides directing these discussions, it cannot be assumed that just because an issue did not arise in a given focus group, the issue is not important. Although responses between AT and NAT have been summarized here, and when similar issues arose in both groups they were noted, making direct comparisons across focus groups is inappropriate. Insights gleaned from these focus groups were

used to develop and refine parent and child surveys for a feasibility study focused on increasing active travel to school.

Last, dual coding of all transcripts would have been preferable to single coding, but this study had several time and resource limitations that precluded dual coding. However, the one coder was familiar with the study aims, was thoroughly trained in coding procedures, and had practiced coding with the trainer before coding all of the focus group transcripts in this study. Despite these limitations, we believe our findings add important new knowledge that can be useful for both practice and further research on walking to school.

Implications for Practitioners

Implications for further research based on these findings are clear. First, more research with ethnically and economically diverse populations and schools is needed to confirm, refute, and/or augment the findings of this study. Second, we need to understand if the barriers that are attributed to fourth- and fifth-grade students and their parents hold for other students in elementary, middle school, and high school. Third, how does geographic setting (urban, suburban, or rural) influence active school travel? Fourth, we need new theories that are robust enough to help plan interventions at multiple levels of the ecologic framework. Although barriers and facilitators to active school travel can be identified at multiple levels, theories to help inform intervention planning must accommodate a multilevel approach. Fifth, we need to understand how best to intervene and the role that community advisory boards may play in this process. When multilevel interventions are proposed, they often cross turf lines that extend beyond the school or local community. Who is best positioned to assume the lead in making these changes? What role might a community coalition play in the intervention process? There is much more research needed to help translate these observed barriers into actionable intervention strategies that can actually be implemented in communities across the nation.

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