Introduction

Children and the environment cover a broad, interdisciplinary field of research and practice. The social sciences often use the word “environment” to mean the social, political, or economic context of children’s lives, but this bibliography covers physical settings. It focuses on a place-based scale that children can see, hear, taste, smell, touch, and navigate: not large, abstract scales such as national identities or population dynamics, or small scales such as environmental impacts on genes or cell functions. Attention to the everyday settings of children’s lives grew in the 18th century, when Romantic literature introduced the theme of children and nature. In the 19th century, concern for children’s welfare included an interest in conditions for children in burgeoning industrial cities, and justifications for early streetcar and railroad suburbs included claims that they would save children from the dangers of cities and provide the healthful benefits of natural surroundings. In the 20th century, academic disciplines developed different lines of inquiry about the impact of the physical environment on children and how children relate to places: ethnographic studies of children in different parts of the world in the fields of anthropology and geography; sociological studies of different populations of children in different settings; educational research on the learning opportunities that different school and out-of-school settings afford; medical research to understand disease vectors and the impact of pollutants on children; and efforts in the field of environment and behavior research more broadly, to understand how built and designed environments affect children physically, cognitively, socially, and emotionally. At the beginning of the 21st century, children and the environment is an active area of inquiry seeking to understand rapidly changing conditions for children as the world urbanizes, opportunities for free play outdoors and independent mobility erode in many parts of the world, media environments consume more of children’s time, and awareness grows that children need opportunities to contribute to creating sustainable societies.

General Overviews

Since the 1970s, how children use environments and how physical environments influence child development have been important topics in environmental psychology and the interdisciplinary field of environment and behavior studies more broadly, as evidenced in Altman and Wohlwill 1978. This work brings together social scientists with people who shape environments through urban planning and design, architecture, and landscape architecture. Extended reviews of this literature in Heft and Wohlwill 1987 and Evans 2006 and the edited collections Weinstein and David 1987 and Spencer and Blades 2006 apply theories of cognitive psychology and child development with the goal of understanding how to create environments that best support children. Holloway and Valentine 2000 is influenced by the sociology of childhood, which argues that childhood and children’s use of space are social constructions, and therefore it emphasizes changes in children’s place experience depending on social contexts. Dudek 2005 and Day and Midbjer 2007 illustrate efforts by architects to apply principles of child development to design.

Altman, Irwin, and Joachim Wohlwill, eds. *Children and the Environment*. New York: Plenum, 1978.

Opening chapters present influential theories and supporting evidence related to four settings of children’s lives: the natural environment, home environments, neighborhood landscapes, and schools. Concluding chapters consider how children’s interactions with the environment can serve the functions of privacy, spatial cognition, and participatory planning.
Day, Christopher, and Anita Midbjer. *Environment and Children*. Oxford: Architectural Press, 2007.

Essays that discuss how built environments affect children’s health, behavior, education, imagination, and their connection to the earth. The book draws on the first author's experience designing schools, kindergartens, and childcare centers, but it generalizes design principles to home environments as well. Illustrated with drawings of design patterns.

Dudek, Mark, ed. *Children’s Spaces*. Oxford: Architectural Press, 2005.

A collection focused on design for children, emphasizing schools and schoolyards but including playgrounds, gardens, communities, and digital landscapes. It examines connections between design and children's learning, advocating that children are competent and creative and need opportunities to express their environmental needs. Useful for the fields of architecture, landscape architecture, and education.

Evans, Gary. “Child Development and the Physical Environment.” *Annual Review of Psychology* 57 (2006): 423–451.

A review of characteristics of the physical environment that influence child development, with an emphasis on risk factors: toxic exposure, noise, crowding, poor housing, and neighborhood quality. A section on schools and daycare centers reviews the impacts of school size, building quality, open-plan designs, lighting, and indoor climate.

Heft, Harry, and Joachim Wohlwill. “The Physical Environment and the Development of the Child.” In *Handbook of Environmental Psychology*. Vol. 1. Edited by Daniel Stokols and Irwin Altman, 281–328. New York: Wiley, 1987.

Anchored in theoretical approaches to understanding the role of the physical environment in child development, this chapter analyzes the environment as a source of stimulation, feedback, and affordances. It applies these perspectives to research on the home, institutional environments, outdoor spaces, and natural and urban environments and discusses implications for design.

Holloway, Sarah, and Gill Valentine, eds. *Children’s Geographies*. Abingdon, UK: Routledge, 2000.

An examination of children’s use of the environment in three domains: “Playing” (leisure use of streets, public spaces, commercial facilities, and rural areas), “Living” (family rules, cyberspace, and streets as home for street children), and “Learning” (regulated space use in primary schools, playgrounds, childcare centers, and cities).

Spencer, Christopher, and Mark Blades, eds. *Children and Their Environments: Learning, Using and Designing Spaces*. Cambridge, UK: Cambridge University Press, 2006.

This collection focuses on how children understand and experience places and participate in their design, with a section dedicated to adolescent experiences. Apart from one chapter on classrooms, it features large-scale environments such as countries, cities, towns, neighborhoods, and natural areas.

Weinstein, Carol, and Thomas David, eds. *Spaces for Children: The Built Environment and Child Development*. New York: Plenum, 1987.

The majority of chapters in this collection are setting specific: the home, playgrounds, childcare settings, and institutions such as schools and juvenile detention centers. Additional chapters discuss children’s interactions with the environment through play, place identity, and participation in design processes.
Journals

Two journals focus on children and environments, carrying articles on a wide range of related topics. The first to be established, Children, Youth and Environments, was originated by the Children’s Environments Research Group and revived by the in the United States, with an emphasis on understanding how children use and evaluate environments in order to improve the physical settings of children’s lives. A newer journal based in the United Kingdom, Children's Geographies, grew out of interests in children’s place experience in geography and the sociology of childhood. Both are interdisciplinary and seek to serve academics, practitioners, and policymakers.

Children's Geographies.
In print since 2003, this is a quarterly forum for research on children’s geographical experience that covers different scales, cultures, and regions of the world. It originated in geography, with the goal of building bridges to other disciplines with interests in the social and cultural contexts of children’s place experience.

Children, Youth and Environments.
The current twice-yearly online version of this journal began in 2003, following a print version published from 1984–1995. Broad international coverage of subjects related to children and the physical environment, combining research articles and notes on practice. Especially relevant to design, urban planning, geography, international development, public health, and education.

Home Environments

Children’s use of home environments and the impact of design on their activities became an area of concentrated research in the 1970s, in response to post–World War II urban renewal and the rapid rise of suburbs. Many post occupancy evaluations were commissioned to understand whether these investments in housing were meeting family needs, and to derive recommendations for more-functional design and planning. Summaries of this work in Pollowy 1977, Cooper Marcus and Sarkissian 1986, and Chawla 1991 remain useful guides for the development of family housing and surrounding sites. With most children now born in the developing world and many born into urban or rural poverty, Bartlett and Iltus 2007 provides a model for meeting the need for affordable, participatory, evidence-based design in these regions of the world. All these texts are well illustrated and summarize design implications for housing designers, planners, developers, housing authorities, and advocates for family-friendly housing.

Bartlett, Sheridan, and Selim Iltus. Making Space for Children: Planning for Post-Disaster Reconstruction with Children and Their Families. Chennai, India: Save the Children, 2007.
This booklet fills a gap in the housing literature by providing principles for the design of houses and neighborhoods for children in middle- and low-income countries in the Southern Hemisphere. It addresses the needs of children from infancy through adolescence and shows how to build child-friendly communities in partnership with children and their families.

Chawla, Louise. “Homes for Children in a Changing Society.” In Advances in Environment, Behavior, and Design. Vol. 3.
Cooper Marcus, Clare, and Wendy Sarkissian. *Housing as If People Mattered: Site Design Guidelines for Medium-Density Family Housing*. Berkeley: University of California Press, 1986.

An essential resource for design and layout advice for medium-density family housing, based on detailed research and post occupancy evaluations. Provides guidelines for community spaces, walkways, play areas, and more.

Pollowy, Anne-Marie. *The Urban Nest*. Stroudsburg, PA: Dowden, Hutchinson and Ross, 1977.

This book remains valuable because it grounds design recommendations in a review of child development. The first part discusses milestones in child development during infancy, the preschool years, and middle childhood. The second part presents design patterns and examples of dwellings, nearby access areas, and neighborhood plans that provide for children’s needs.

**IMPACTS OF HOME ENVIRONMENTS ON HEALTH AND WELL-BEING**

From the beginning of research on children and environments, an area of concern has been the potential negative impact of the environment on children. Many of the texts in General Overviews and Environments of Risk reflect this concern. Wohlwill and van Vliet 1985 remains a basic resource for understanding the effects of density on children. Gifford 2007 provides a recent review of the effects of high-rise living. Cohen 2011 reviews : Planning for Post-Disaster Reconstruction with Children and Their Families, while Evans, et al. 2001 finds negative impacts of poor-quality housing on children’s psychological functioning. Strasburger and Wilson 2002 addresses a recent topic of concern: the increasing influence of media on children’s lives at home and in other settings. Crowther 2005 and Wendel, et al. 2008, which are overviews of research on healthy environments, target undergraduate students in early childhood and public health officials, respectively.

Cohen, Rebecca. *The Impacts of Affordable Housing on Health: A Research Summary*. Washington, DC: Center for Housing Policy, 2011.

This well-referenced report organizes research related to the health benefits of affordable housing around the topics of stress, exposure to toxins and infectious diseases, nutrition, access to healthcare and other amenities, self-esteem, and a sense of control of the environment. Many of the cited studies involve children. Also see the Center for Housing Policy’s annotated bibliography.

Crowther, Ingrid. *Safe and Healthy Children’s Environments*. Toronto: Pearson Education Canada, 2005.

A textbook for undergraduate courses in early childhood, with a focus on health, safety, and nutrition in environments for young children. It includes a CD-ROM for interactive learning.

Evans, Gary, Heidi Saltzman, and Jana Cooperman. “Housing Quality and Children’s Socioemotional Health.” *Environment and Behavior* 33.3 (2001): 389–399.
This study compared observers’ ratings of housing quality with measures of children’s psychological distress. Independent of household income, third- through fifth-grade children in poorer housing had more psychological symptoms than children in better-quality housing.

Gifford, Robert. “The Consequences of Living in High-Rise Buildings.” Architectural Science Review 50.1 (2007): 2–17.
A review of research on the social and psychological effects of living in tall buildings, with a section dedicated to children. It finds evidence that children have problems in high-rises, especially in the areas of more-restricted play and less time outdoors. Fewer effects are documented for teenagers.

Strasburger, Victor, and Barbara Wilson. Children, Adolescents and the Media. Thousand Oaks, CA: SAGE, 2002.
Textbook of use to parents, educators, and policymakers, as well as university students. Broad examination of research on children’s interactions with media and media’s effects, with strategies for addressing negative trends while recognizing media’s positive potentials. Timely, considering that Kaiser Family Foundation reports show increasing levels of media use by young people.

Wendel, Arthur, Andrew Dannenberg, and Howard Frumkin. “Designing and Building Healthy Places for Children.” International Journal of Environment and Health 2.3–4 (2008): 338–355.
A comprehensive discussion of components of the built environment that can be designed to promote children’s health, including protecting children from injury, pollutants, and disease, and providing opportunities for physical activity, play, and experiences of nature. Citations lead readers to key publications at the scale of the home and surrounding community.

Wohllwill, Joachim, and Willem van Vliet, eds. Habitats for Children: The Impacts of Density. Hillsdale, NJ: Lawrence Erlbaum, 1985.
A landmark review of the impacts both of high densities associated with crowding and low densities associated with isolation in children’s homes and neighborhoods. It gives special attention to the impact of noise in areas of high density and considers how adaptation to long-term exposure and other factors may mediate density’s impact.

THE MEANING OF HOME
The quality of homes and nearby environments for children matters not only because of impacts on health, physical, cognitive, and social development but also because it affects children’s emotional bonds with the places where they live and relations with places across the lifespan. Cooper Marcus 2006 explores this topic through the medium of environmental autobiography, identifying implications for the design of homes and surrounding sites. Goodenough 2003 presents an eclectic mix of work by artists, writers, and social researchers who seek to understand children’s special places through memory and direct work with children. Korpela 2002 reviews different concepts and approaches in environmental psychology to understanding young people’s emotional relations with places.

Cooper Marcus Clare. House as a Mirror of Self. Berwick, ME: Nicolas-Hays, 2006.
An introduction to the field of environmental autobiography, which uses people’s accounts of their past and current places to understand how to design places that satisfy personal needs. It begins with a chapter called “The Special Places of Childhood” and draws principles for making a home comfortable for children.
Goodenough, Elizabeth, ed. *Secret Spaces of Childhood*. Ann Arbor: University of Michigan Press, 2003.

This collection of essays, poems, images, fiction, and research reports explores the significance of secret spaces that children claim for themselves in and around the home. An accessible blend of insights by artists and academics.

Korpela, Kalevi. “Children’s Environment.” In *Handbook of Environmental Psychology*. Edited by Robert Bechtel and Arza Churchman, 363–373. New York: Wiley, 2002.

This chapter focuses on children’s emotional connections to places. It reviews research on place preferences, favorite-place selections by gender and stage of development, factors affecting favorite-place selection, restoration in favorite places, environmental self-regulation, place identity, and place attachment.

**Neighborhoods**

Beyond the home, the neighborhood is another primary environment for children’s development, where children need opportunities to play, explore, travel independently, engage with adults and diverse social groups as well as playmates, encounter the natural world, and access cultural and commercial resources. Studies of how children use and value local landscapes typically apply mixed methods, with an emphasis on ethnographic fieldwork and asking children to map or draw their local territory. Lynch 1977 introduces a set of such methods to understand how city neighborhoods of different types function for young residents. Chawla updated her approach and demonstrated its application in eight countries (Chawla 2002). Also influenced by Lynch 1977, Hart 1979 and Moore 1990 combine quantitative and qualitative methods to develop rich accounts of children’s use of environmental resources in rural and urban communities. Sobel 2002 shows children’s passion for colonizing spaces to create their own worlds and how to apply these landscape connections to elementary education. Malone 2007 is an international compilation of ethnographic studies with children on six continents. The topic of Child-Friendly Cities includes rights-based discussions of urban neighborhood quality.

Chawla, Louise, ed. *Growing Up in an Urbanising World*. London: Earthscan, 2002.

This collection updates Lynch 1977 in the context of the United Nations Convention on the Rights of the Child, which supports participatory processes for bringing children’s ideas into urban planning and development. Case studies in eight countries demonstrate success and challenges in action research with children to improve their communities.

Hart, Roger. *Children’s Experience of Place*. New York: Irvington, 1979.

A pioneering work, not only for its subject but also for its array of methods to understand children’s spatial behavior, place knowledge, place use, and place values and feelings. After presenting group data on children in a Vermont town, it brings together these different facets of children’s experience through two case studies.

Lynch, Kevin, ed. *Growing Up in Cities*. Cambridge, MA: MIT Press, 1977.

Lynch introduced methods to understand how children use local neighborhoods and how the environment can best serve them. This report describes their application in four countries, with a detailed methods guide. A classic call for child-centered city planning based on
Malone, Karen, ed. *Child Space*. New Delhi: Concept, 2007.

Using ethnographic methods, ten chapters investigate children's place experiences in different cultural contexts, including war-torn Sri Lanka, an African squatter camp, a Pacific island, rural India, and an English town. Concludes with an examination of children's use of cyberspace. An important contribution to understanding the global diversity of children's places.

Moore, Robin. *Childhood’s Domain*. Berkeley, CA: MIG Communications, 1990.

An ethnographic comparison of children’s use of their neighborhoods in old and new towns in England, with close attention to implications for urban design and planning. It features children in different social as well as environmental contexts. Originally published by Croom Helm in 1986.

Sobel, David. *Children’s Special Places: Exploring the Role of Forts, Dens, and Bush Houses in Middle Childhood*. Detroit: Wayne State University Press, 2002.

Ethnographic comparison of children in England and Grenada, finding many similarities in their appropriation of spaces to create their own worlds for creative play. Curriculum examples of children’s engagement with local landscapes to enrich elementary education. Useful for parents, teachers, and students in childhood studies, education, geography, and landscape design.

**CHILDREN’S ACCESS TO THE OUTDOORS**

The concept of territorial range, or the areas that children can move through and explore independently or with playmates, siblings, or adults, is a long-standing topic of interest in research on children and environments, as Moore and Young 1978 and van Vliet 1983 show. Interest in this topic is also evident in books on Neighborhoods more broadly. As Wridt 2004 and Karsten 2005 demonstrate through the authors’ own research and the literature they review, children’s range of free movement outdoors has generally been shrinking, with more children spending more time indoors or chauffeured from place to place by parents. Concern over this trend and its implications for children's outdoor recreation and well-being motivates Muñoz 2009, a literature review. The concept of territorial range is also related to Children’s Independent Mobility, although it emphasizes the breadth and depth of children’s place experience rather than modes of travel and factors that determine whether children can travel independently.

Karsten, Lia. “It All Used to Be Better? Different Generations on Continuity and Change in Urban Children’s Daily Use of Space.” *Children’s Geographies* 3.3 (2005): 275–290.

Comparison of children’s changing use of streets and other open spaces in three socially diverse Amsterdam neighborhoods. Based on oral histories, interviews with contemporary children and parents, archival and statistical research, and street observations. It finds two new types of children with diminished outdoor ranges: indoor children and backseat children.

Moore, Robin, and Donald Young. “Childhood Outdoors: Toward a Social Ecology of the Landscape.” In *Children and the Environment*. Edited by Irwin Altman and Joachim Wohlwill, 83–130. New York: Plenum, 1978.

An introduction to key terms and a conceptual framework that organizes emerging research on children's use of local landscapes. It argues that children's landscape experience can be described by connecting the concepts of territorial range, place, and pathways.
These are basic concepts that remain central to this area of study.

Muñoz, Sarah-Anne. *Children in the Outdoors: A Literature Review*. Forres, UK: Sustainable Development Research Centre, 2009.

An extensive literature review that covers links among children’s outdoor use and health, children’s play both in wild and designed outdoor spaces, education outdoors, and factors that constrain and enable children’s use of the outdoors. A good entry point into this literature.

van Vliet, Willem. “Exploring the Fourth Environment: An Examination of the Home Range of City and Suburban Teenagers.” *Environment and Behavior* 15.5 (1983): 567–588.

The author coins the term “fourth environment” to mean spaces outside home, school, and parks, where children fulfill important developmental functions. The study finds that children who travel farther from home and have a greater behavioral range tend to have greater access to resources.

Wridt, Pamela. “An Historical Analysis of Young People’s Use of Public Space, Parks and Playgrounds in New York City.” *Children, Youth and Environments* 14.1 (2004): 86–106.

Oral histories of people who grew up in working-class neighborhoods of New York since 1940. Reveals decreasing street play and increasing containment in parks and playgrounds. As the quality of these spaces has deteriorated, children have largely retreated indoors.

**NEIGHBORHOOD INFLUENCES ON CHILDREN’S OUTDOOR PLAY, ACTIVITY LEVELS, AND WEIGHT**

An active area of current research investigates associations among children’s levels of outdoor play, physical activity, and health—apparent in the fact that all of the references in this section are research reviews published since 2006. Most of this research is driven by concern over high rates of childhood obesity, on the assumption that more opportunities for physical activity outdoors and in local recreation facilities and more access to healthful food in local supermarkets and farmers markets will reduce weight gain. This is the assumption that guides the 2009 statement of the Committee on Environmental Health of the American Academy of Pediatrics (see Committee on Environmental Health 2009). Davison and Lawson 2006 and Rahman, et al. 2011 find evidence that features of the built environment are associated with levels of physical activity, but Carter and Dubois 2010 and Ferreira, et al. 2007 conclude that, given methodological limitations of many studies, the most-consistent factors associated with childhood obesity are social and economic. Sallis and Glanz 2006 observes that research is still lacking to show that changes in the physical environment to encourage physical activity and healthful eating will translate into a decrease in body weight for children.

Carter, Megan, and Lise Dubois. “Neighborhoods and Childhood Adiposity: A Critical Appraisal of the Literature.” *Health and Place* 16.3 (2010): 616–628.

Review of twenty-seven studies to examine relationships between physical and social attributes of neighborhoods and childhood obesity. It found a consistent positive association between socioeconomic disadvantage and being overweight, with some evidence that high social capital is a protective factor. Given the methodological limitations of many studies, the role of other neighborhood features isn’t clear.
Committee on Environmental Health. “The Built Environment: Designing Communities to Promote Physical Activity in Children.” *Pediatrics* 123.6 (2009): 1591–1598.

This policy statement signals the entry of the American Academy of Pediatrics into discussions about the influence of the built environment on children's health. Succinct summary of many references that demonstrate that children’s opportunities for physical activity are affected by neighborhood design, including roads, streetscapes, parks, recreational facilities, and sprawl.

Davison, Kirsten, and Catherine Lawson. “Do Attributes in the Physical Environment Influence Children’s Physical Activity? A Review of the Literature.” *International Journal of Behavioral Nutrition and Physical Activity* 3.19 (2006): 1–17.

Review of thirty-three studies that assessed associations between the environment and physical activity in children aged three to eighteen. Children’s levels of physical activity are positively associated with public recreation facilities and nearby schools, mass transit, sidewalks, and accessible destinations, while local crime and dangerous traffic conditions are associated with lower activity.

Ferreira, Isabel, Klazine van der Horst, Wanda Wendel-Vos, Stef Kremers, Frank van Lenthe, and Johannes Brug. “Environmental Correlates of Physical Activity in Youth—a Review and Update.” *Obesity Reviews* 8.2 (2007): 129–154.

Review of 150 studies published in the past 25 years related to environmental factors associated with the physical activity of children and adolescents. The most-consistent factors associated with levels of physical activity were time spent outdoors, family education and income, social support, school policies, and neighborhood crime rates.

Rahman, Tamanna, Rachel Cushing, and Richard Jackson. “Contributions of the Built Environment to Childhood Obesity.” *Mount Sinai Journal of Medicine* 78.1 (2011): 49–67.

A review of research that investigates relationships between features of the built environment and overweight children. Walkable and bikeable neighborhoods, mixed land uses, accessible destinations, and mass transit are associated with increased physical activity. Access to convenience stores increases the risks of obesity; access to supermarkets and farmers’ markets decreases it.

Sallis, James, and Karen Glanz. “The Role of Built Environments in Physical Activity, Eating, and Obesity in Childhood.” *The Future of Children* 16.1 (2006): 89–108.

This review notes that research has found many links between the physical environment and children's physical activity, as well as connections among childhood obesity, a reliance on fast foods, and lack of access to fruits and vegetables. There is not yet conclusive evidence, however, that changes in the built environment or food environment will lower obesity rates.

**DESIGN AND PRACTICE TO PROMOTE OUTDOOR PLAY**

Design guidelines for Home Environments include recommendations for housing sites and nearby spaces, but Moore and Cooper Marcus 2008 is distinctive for its broad coverage of outdoor spaces, including shared greens, parks, playgrounds, school grounds, the grounds of childcare centers, and pathways for children’s free movement to access neighborhood resources. Goodenough 2008 presents programs and practices to enable children to play outside and fulfill their diverse interests at different ages. Tovey 2007 provides well-reasoned arguments for outdoor play around the home and at school.
Goodenough, Elizabeth, ed. *A Place for Play*. Ann Arbor, MI: National Institute for Play, 2008.

Rather than specific design recommendations, this wide-ranging collection of essays, research papers, and notes on practice presents different strategies to create locations for children's play in neighborhoods. An engaging introduction to issues and practical interventions suitable for undergraduate classes, community groups, teachers, school administrators, and municipal staff.

Moore, Robin, and Clare Cooper Marcus. “Healthy Planet, Healthy Children: Designing Nature into the Daily Spaces of Childhood.” In *Biophilic Design*. Edited by Stephen Kellert, Judith Heerwagen, and Martin Mador, 153–203. Hoboken, NJ: Wiley, 2008.

This chapter brings together two designers with decades of research and practice related to how neighborhoods function for families with children and how to afford free movement for play and nature discovery via residential site design, parks, school grounds, greenways, alleys, and traffic-protected zones. An authoritative synthesis of great value for developers and designers.

Tovey, Helen. *Playing Outdoors*. Maidenhead, UK: Open University Press, 2007.

Wise arguments for the value of outdoor play and opportunities for children to take manageable risks, with advice about how to include creative play outdoors in early-childhood settings. Useful for parents, housing associations, school administrators, teachers, and university students in early-childhood education or landscape design.

**Children's Independent Mobility**

Children's independent mobility, or ability to move through the environment by walking, biking, or other independent means, is an active area of research that overlaps with the study of Children's Access to the Outdoors and Neighborhood Influences on Children's Outdoor Play, Activity Levels, and Weight. It is distinguished by its focus on rules, preferences, and other factors that determine children's modes of travel and the impact of varying mobility levels on children. Valentine 1997 and O'Brien, et al. 2000 examine children's freedom of movement in public spaces, while Fotel and Thomsen 2004 describes different ways that parents attempt to control their children's movement. A rapidly expanding body of literature, reviewed in Sirard and Slater 2008, relates specifically to children's journeys to school. Policies to promote children's independent mobility are an important part of Child-Friendly Cities.

Fotel, Trine, and Thyra Thomsen. “The Surveillance of Children's Mobility.” *Society* 1.4 (2004): 535–554.

This mixed-methods study charts the character of parents' surveillance of their children's mobility. It examines three dimensions of surveillance: power relations in mobility practice, chauffeuring as a form of monitoring, and behavioral restrictions and technology as means of remote control.

O'Brien, Margaret, Deborah Jones, David Sloan, and Michael Rustin. “Children's Independent Spatial Mobility in the Urban Public Realm.” *Childhood* 7.3 (2000): 257–277.

This research used surveys, interviews, mapping exercises, walkabouts, neighborhood observations, and photojournals to examine children's movement in the urban public realm. The authors found significant variation in the ways that children used public spaces and concluded that children negotiate a complex interaction of constraint and choice as they enter the public realm.
Sirard, John, and Megan Slater. “Walking and Biking to School: A Review.” *American Journal of Lifestyle Medicine* 2.5 (2008): 372–396.

This review presents four themes: prevalence estimates for active school travel; correlates of active school travel; the relationship between active travel and health indicators, commuting, and activity levels; and recommendations for further research. The studies reviewed vary considerably in terms of sample sizes, demographics, methods, and conceptual definitions.

Valentine, Gill. “‘Oh Yes I Can.’ ‘Oh No You Can’t’: Children and Parents' Understandings of Kids' Competence to Negotiate Public Space Safely.” *Antipode* 29 (1997): 65–89.

This qualitative study used data from interviews and focus groups to examine children’s competence to negotiate public spaces alone safely. The findings describe a fluid, shifting, and inconsistent relationship between children’s and parents’ perceived competence, which affects children’s mobility experience.

**INFLUENCES ON INDEPENDENT MOBILITY**

Using a mix of quantitative and qualitative methods, many studies examine influences on children’s levels of independence in the environment. Pooley, et al. 2005; Brown, et al. 2008; and Veitch, et al. 2008 investigate personal, social, and socioeconomic factors, such as gender, age, family structure, and family income. Jones, et al. 2000; Kyttä 2004; and Prezza, et al. 2010 also consider features of the environment. Prezza, et al. 2001 and Fyhri and Hjorthol 2009 explore the full range of influences.

Brown, Belinda, Roger Mackett, Yi Gong nonInvertible, Kay Kitazawa, and James Paskins. “Gender Differences in Children’s Pathways to Independent Mobility.” *Children’s Geographies* 6.4 (2008): 385–401.

This qualitative study from the United Kingdom examines gender differences in experiences of independent mobility. For girls, mobility involves public transport, group travel, and visiting people and places at greater distances. The authors argue that the current model of independent mobility inappropriately describes girls’ experience as a limited version of boys’ experience.

Fyhri, Aslak, and Randi Hjorthol. “Children’s Independent Mobility to School, Friends and Leisure Activities.” *Journal of Transport Geography* 17.5 (2009): 377–384.

This study uses structural equation modeling with data from the 2005 Norwegian National Travel Survey to establish a measure of independent mobility for children's school and leisure travel. Distance and age are the most-significant variables influencing travel mode, and their impacts are mediated through parents’ perceptions of traffic safety.

Kyttä, Marketta. “The Extent of Children’s Independent Mobility and the Number of Actualized Affordances as Criteria of a Child-Friendly Environment.” *Journal of Environmental Psychology* 24.2 (2004): 179–198.

Examines actualized affordances and children’s independent mobility. The author developed a model to describe four possible environmental scenarios—Bullerby, Glasshouse, Wasteland, and Cell—differentiated by levels of independent mobility and actualized affordances. She used interviews and questionnaires to test the model in Finland and Belarus.

Jones, Linda, Adrian Davis, and Tim Eyers. “Young People, Transport and Risk: Comparing Access and Independent Mobility
in Urban, Suburban and Rural Environments.” *Health Education Journal* 59.4 (2000): 315–328.

A qualitative study of children’s perceptions of travel, access, and independent mobility in three locations differentiated by population density. Perceptions of risk differed contextually, but children generally used evasion and collusion with peers to manage risks and assuage parental concerns. The authors argue that policy supports parental risk avoidance more than children’s risk negotiation.

Pooley, Colin, Jean Turnbull, and Mags Adams. “‘. . .Everywhere She Went I Had to Tag Along Beside Her’: Family, Life Course, and Everyday Mobility in England Since the 1940s.” *The History of the Family* 10.2 (2005): 119–136.

This cross-sectional study used 156 in-depth oral-history interviews with a respondent pool stratified by age/generation to examine mobility, life course, and family structure. The authors conclude that while mobility experiences in general are individually determined, for children they also relate to family structures, which have not changed significantly over time.

Prezza, Miretta, Francesca Romana Alparone, Daniela Renzi, and Annalisa Pietrobono. “Social Participation and Independent Mobility in Children.” *Journal of Prevention & Intervention in the Community* 38.1 (2010): 8–25.

This study compared two case studies of the “We Go to School Alone” program, which aimed to increase students’ autonomous travel. It found significant differences in the program’s impact, explained in part by differential community and government involvement and support.

Prezza, Miretta, Stefania Pilloni, Carmelo Morabito, Cinzia Sersante, Francesca Romana Alparone, and Maria Vittoria Giuliani. “The Influence of Psychosocial and Environmental Factors on Children’s Independent Mobility and Relationship to Peer Frequentation.” *Journal of Community & Applied Social Psychology* 11.6 (2001): 435–450.

This Italian study used semi structured interviews along with scales of sense of community and neighborhood relations to examine the influence of demographic, psychosocial, and environmental variables on independent mobility, and the influence of independent mobility on children’s visits with friends.

Veitch, Jenny, Jo Salmon, and Kylie Ball. “Children’s Active Free Play in Local Neighbourhoods.” *Health Education Research* 23.5 (2008): 870–879.

This Australian study combined a survey with a children’s mapping exercise to compare children’s access to neighborhood places by a variety of demographic variables. The findings emphasized socioeconomic variables, suggesting that policy should promote equitable access to parklands for free play.

**IMPACTS OF INDEPENDENT MOBILITY**

A number of studies have used objective measures and surveys to examine the influence of mobility on activity levels. Mackett, et al. 2007 is an example that documents the advantages of limited restrictions. Other studies use a variety of methods to examine the impact of mobility on children’s intellectual and emotional development, as well as the quality of life both of children and caregivers (Hillman 1993; Page, et al. 2010; Rissotto and Tonucci 2002).

Hillman, Mayer, ed. *Transport and the Quality of Life*. London: Policy Studies Institute, 1993.
This edited volume presents policy implications of “One False Move,” a seminal study conducted for the Policy Studies Institute. It addresses children’s rights, developmental impacts of restricted mobility, effects on caregivers, and environmental impacts of escorting. It argues against using accident counts as a measure of road safety.

Mackett, Roger, Belinda Brown, Yi Gong, Kay Kitazawa, and James Paskins. Setting Children Free: Children’s Independent Movement in the Local Environment. Working Paper Series 118. London: Centre for Advanced Spatial Analysis, University College London, 2007.

As part of the CAPABLE project, this mixed-methods study examines how children interact with local environments. The authors find that children with fewer mobility restrictions spend more time outdoors, visit friends more frequently, and spend more time using electronic entertainment. Children take advantage of unaccompanied travel to explore their environments more extensively.

Page, Angie, Ashley Cooper, Pippa Griew, and Russell Jago. “Independent Mobility, Perceptions of the Built Environment and Children’s Participation in Play, Active Travel and Structured Exercise and Sport.” International Journal of Behavioral Nutrition and Physical Activity 7.17 (2010): 1–10.

This study for the PEACH Project analyzed computerized student questionnaires to examine levels of independent mobility, environmental perceptions, play, travel, and exercise. Environmental perceptions related to activity levels varied depending on the context and activity. Higher degrees of independent mobility were consistently associated with higher activity levels.

Rissotto, Antonella, and Francesca Tonucci. “Freedom of Movement and Environmental Knowledge in Elementary School Children.” Journal of Environmental Psychology 22.1–2 (2002): 65–77.

This Italian study used cognitive mapping exercises to examine the impact of limited autonomy on children’s environmental knowledge. The authors argue that freedom of movement is critical for acquiring, processing, and structuring knowledge about the environment.

Natural Environments

Since Romantic poets and philosophers introduced the theme of children in nature, the value of enabling children to connect with the natural world has been explored in literature and more recently in research on children and environments. Chawla 1994 traces the influence of these ideas on people’s responses to children, nature, and their own childhood memories. Through essays by naturalists and nature writers, Carson 1965 and Nabhan and Trimble 1994 develop the importance of nature for children. Louv 2008 brought international attention to concerns that contemporary children have largely lost access to play and exploration in natural areas, and the Children and Nature Network that Louv helped found continues to lead and monitor the Leave No Child Inside movement that his book catalyzed. Kahn and Kellert 2002 explores children’s relations with nature from the perspective of different academic disciplines, and Kahn 1999 investigates children’s reasoning about nature, through the discipline of developmental psychology. Searles 1959 remains unique as a comprehensive reflection on the role of the natural environment in child development, through the lens of psychoanalytic theory.

Carson, Rachel. The Sense of Wonder. New York: Harper and Row, 1965.

This book-length essay and collection of photographs continue to inspire parents, teachers, and others who seek to connect children with nature. Subsequent research confirms Carson’s recommendations about how to introduce children to nature, but no one has
expressed the same points more eloquently. Originally published in Woman’s Home Companion in 1956.

Chawla, Louise. In the First Country of Places: Nature, Poetry and Childhood Memory. Albany: State University of New York Press, 1994.

Through the medium of interviews with five well-published poets and their writings, this book compares ideas about children and nature in the Romantic era with contemporary ideas in different cultures in the United States. It examines how people remember and use childhood experiences of nature differently, depending on their culture and gender.

Children and Nature Network.

Website of the organization established by journalist Richard Louv and colleagues to disseminate research and resources and to promote action and advocacy to increase children’s access to natural areas. Its volumes of Research and Studies are the best source of annotated bibliographies on the topic of children, nature, and outdoor play.

Kahn, Peter. The Human Relationship with Nature. Cambridge, MA: MIT Press, 1999.

Drawing on interviews with children in four countries, this book places children’s developing understanding of the natural world in a solid framework of child development theory. It includes a discussion of the biophilia hypothesis and its implications for research with children.

Kahn, Peter, and Stephen Kellert, eds. Children and Nature: Psychological, Sociocultural, and Evolutionary Investigations. Cambridge, MA: MIT Press, 2002.

A collection of chapters by experts who consider children’s relations with nature from diverse perspectives, including evolutionary biology, developmental psychology, child therapy, education, and political science. It covers all stages of childhood, including adolescence.

Louv, Richard. Last Child in the Woods. 2d ed. Chapel Hill, NC: Algonquin, 2008.

A journalist's well-researched investigation of children’s access to natural areas through free play, exploration, and school-based and out-of-school programs. A best-seller that popularized the term “nature deficit disorder” and catalyzed an international Leave No Child Inside movement. First edition published in 2005.

Nabhan, Gary, and Stephen Trimble. The Geography of Childhood: Why Children Need Wild Places. Boston: Beacon, 1994.

A series of essays that alternate the voice of each author in turn, reflecting on the value of natural areas, native plants, and animals in children’s lives and developing the premise that children need contact with wild areas. Accessible to general readers.

Searles, Harold. The Nonhuman Environment in Normal Development and in Schizophrenia. New York: International Universities Press, 1959.

A profound application of psychoanalytic theory to the role of the natural environment in normal human development, with extensive reflections on infancy, childhood, and adolescence, as well as the significance of the environment in mental illness. A foundational work.
BENEFITS OF ACCESS TO NATURE

Research shows that contact with nature and with animals benefits children’s social, cognitive, and emotional development in a number of ways. Faber Taylor and Kuo 2006 reviews this literature, and Faber Taylor and Kuo 2009 adds additional evidence that time in green spaces reduces symptoms of Attention Deficit Hyperactivity Disorder (ADHD) in children. According to the review in Chawla 2009, direct experiences of nature are vital for children’s development of empathy and care for the natural world.

Chawla, Louise. “Growing Up Green: Becoming an Agent of Care for the Natural World.” *Journal of Developmental Processes* 4.1 (2009): 6–23.
A review of research that investigates how people develop active care for the natural world during childhood and adolescence. It places research within theories of the development of a sense of self-efficacy, achievement motivation, and empathy.

Faber Taylor, Andrea, and Frances Kuo. “Is Contact with Nature Important for Healthy Child Development? State of the Evidence.” In *Children and Their Environments*. Edited by Christopher Spencer and Mark Blades, 124–140. Cambridge, UK: Cambridge University Press, 2006.
A systematic review of research through 2004, divided into sections on “Children and Green Space” and “Children and Animals.” Assesses evidence for causal links between contact with nature and consequences for children, with an emphasis on experimental and quasi-experimental studies and more-limited attention to correlational research.

Faber Taylor, Andrea, and Frances Kuo. “Children with Attention Deficits Concentrate Better After Walk in the Park.” *Journal of Attention Disorders* 12.5 (2009): 402–409.
A report of an experiment that gave children diagnosed with ADHD a task requiring focused attention and then walked them through one of three environments—an urban park, a downtown area, or a residential area. Children concentrated better on a subsequent task and rated their walk more positively after walking through the park.

CONNECTING CHILDREN TO NATURE THROUGH EDUCATION AND DESIGN

Sobel 2008 presents influential ideas such as place-based education and ecophobia in an accessible collection of essays. Banning and Sullivan 2011 shows numerous ways to connect children with nature in childcare centers, preschools, and elementary schools. Both books are addressed to educators but equally relevant to parents. Tai, et al. 2006 provides a guide to designing nature into children’s environments on school grounds, playgrounds, and in other spaces. Books that develop the theme of Natural Environments also present exemplary models of how to introduce children to the natural world, and further ideas for integrating nature into children’s everyday lives can be found in *Design and Practice to Promote Outdoor Play and Gardens and School Ground Greening*.

Banning, Wendy, and Ginny Sullivan. *Lens on Outdoor Learning*. St. Paul, MN: Redleaf, 2011.
A practical guide to educating young children in nature, illustrated with stories of children outdoors and many full-colored photographs. Activities are organized according to standards of early learning to show how standards can be achieved through the medium of nature.
Sobel, David. *Children and Nature: Design Principles for Educators*. Portland, ME: Stenhouse, 2008.

A collection of essays for parents, teachers, school administrators, or undergraduate classes in education or environmental studies. With minimal but useful endnotes for further reading, it introduces a wide range of topics relevant to children's relations with nature, including transcendent experiences, place-based education, media use, and global climate change. Originally published by Zephyr Press in 1993.

Tai, Lolly, Mary Haque, and Gina McLellan. *Designing Outdoor Environments for Children: Landscaping Schoolyards, Gardens, and Playgrounds*. New York: McGraw-Hill, 2006.

Written for landscape architects, parents, and staff in schools, parks, and other institutions for children. This comprehensive text covers the history of children’s gardens, the design process, sustainable design, fundraising, curriculum connections, and other practical topics. Extensively illustrated and with case studies, with a focus on high-end, high-dollar gardens.

**School Environments**

The literature on school environments is broadly organized around three themes: the relationship between the architectural form or spatial configurations of school facilities and student achievement; the relationship between sustainable school design and student learning, health, and well-being; and the participatory design of schools. Nair, et al. 2009 crosses more than one theme. For small children, the first institution for living and learning is often a childcare center, for which Olds 2001 presents design guidelines. School environments are also covered in General Overviews and Gardens and School Ground Greening.

Nair, Prakash, Randall Fielding, and Jeffrey Lackney. *The Language of School Design: Design Patterns for 21st Century Schools*. 2d ed. Minneapolis: DesignShare, 2009.

Useful for architects, facility planners, and user groups involved in the design of new school buildings. It presents a series of graphical cases exemplifying common design features of school environments. These design patterns are intended to facilitate communication between users and designers during a collaborative design process.

Olds, Anita. *Child Care Design Guide*. New York: McGraw-Hill, 2001.

This book is the result of Olds’s lifetime of experience creating spaces for young children. It covers every step of the design process, ingredients of good design from healthful building systems to furnishings, and the interior design of rooms to serve a variety of functions. Valuable for designers, center administrators, and staff.

**ARCHITECTURAL FORM AND STUDENT ACHIEVEMENT**

Several aspects of architectural form have been examined for impacts on student achievement. Barker and Gump 1964 catalyzed an ongoing debate regarding optimal school size. Mosteller 1995 focuses on class size; Maxwell 2003, on classroom density. The effects of other aspects of school environments, such as maintenance and attractiveness, have been investigated in Tanner 2000 and Kumar, et al. 2008. Martin 2002 explores the relationship between classroom configuration and pedagogy.

Barker, Roger, and Paul Gump. *Big School, Small School: High School Size and Student Behavior*. Stanford, CA: Stanford
University Press, 1964.

An early investigation into the effect of school size on students’ academic achievement. It suggests that students in smaller high schools (under 500 students) have more positive self-image and show more personal responsibility.

Kumar, Revathy, Patrick O’Malley, and Lloyd Johnston. “Association between Physical Environment of Secondary Schools and Student Problem Behavior.” *Environment and Behavior* 40.4 (2008): 455–486.

This study of 70,883 students from eighth-, tenth-, and twelfth-grade public and private schools in the United States examined the effect of school physical features (attractiveness, neglect, and supervision) on student substance use (tobacco, marijuana, alcohol) and truancy. Positive and negative school environments more significantly affected tenth-grade student behaviors.

Martin, Sandra Horne. “The Classroom Environment and Its Effects on the Practice of Teachers.” *Journal of Environmental Psychology* 22 (2002): 139–156.

This study examines the relationship among the physical classroom environment, pedagogy, and teacher attitudes and beliefs about the role of the classroom design in their teaching. The methodology may be of interest to those undertaking similar investigations into the effect of the physical environment on teaching and learning.

Maxwell, Lorraine. “Home and School Density Effects on Elementary School Children: The Role of Spatial Density.” *Environment and Behavior* 35.4 (2003): 566–578.

Findings from this study suggest that density, the ratio of student population to classroom space, may be a significant factor in primary-school students’ academic achievement and behavior. The findings indicate that future research on class size should consider density as a variable of interest.

Mosteller, Frederick. “The Tennessee Study of Class Size in the Early School Grades.” *The Future of Children* 5.2 (1995): 113–127.

Findings from this longitudinal experimental study indicate that class size directly affects primary-level students’ academic achievement. Although debate is ongoing regarding thresholds where class size begins to negatively affect learning, this is an important study in a growing body of evidence that suggests that class size has an impact.

Tanner, C. Kenneth. “The Influence of School Architecture on Academic Achievement.” *Journal of Educational Administration* 38.4 (2000): 309–330.

Describes an instrument developed to measure thirty-nine design patterns of physical features in forty-four elementary schools. Seven design patterns were found to correlate with higher student standardized test scores, suggesting the potential reliability of new instruments to assess the impact of architectural design features on learning.

**SUSTAINABLE SCHOOLS**

Sustainable design generally focuses on factors that improve environmental health and human well-being, such as energy efficiency (Kats 2006), day lighting (Heschong Mahone Group 1999), indoor air quality (Mendell and Heath 2005), thermal comfort (Mendell and Heath 2005, Bernardi and Kowaltowski 2006), acoustics (Klatte, et al. 2010), views (Matsuoka 2010), and fostering environmental...
stewardship (Hacking, et al. 2010). Center for Green Schools serves as a clearinghouse for research and other resources on the design of green schools.

Bernardi, Núbia, and Doris Kowaltowski. “Environmental Comfort in School Buildings.” *Environment and Behavior* 38.2 (2006): 155–172.

Findings from this case study of classrooms in two São Paulo, Brazil, schools indicate students may feel they do not have power to participate in controlling conditions of their environment to meet their comfort levels. The researchers suggest that environmental apathy may lead to inability to adapt to place.

Center for Green Schools.

This website sponsored by the US Green Building Council provides links to empirical research, guides, programs, and case studies of sustainable school buildings.

Hacking, Elisabeth Barratt, William Scott, and Elsa Lee. *Evidence of Impact of Sustainable Schools*. Bath, UK: University of Bath, Centre for Research in Education and the Environment, 2010.

A report of recent empirical evidence pertaining to sustainable schools in five areas: improving school design, educational practices, student participation, community engagement, and modeling sustainability. Findings are organized under fifteen best practices for sustainable schools that may be useful for informing school design processes and educational practices.

Heschong Mahone Group. *Daylighting in Schools: An Investigation into the Relationship between Daylighting and Human Performance*. Fair Oaks, CA: Heschong Mahone Group, 1999.

The benefits of day lighting on student achievement were examined in this often-cited study. Twenty-one thousand elementary students from California, Washington, and Colorado schools were found to perform significantly higher on math and reading tests in classrooms with more natural lighting. A follow-up study was conducted in 2002, with similar results.

Kats, Greg. *Greening America’s Schools: Costs and Benefits*. Capital E, 2006.

A report sponsored by the American Federation of Teachers, American Institute of Architects, American Lung Association, Federation of American Scientists, and the US Green Building Council, which examines the financial costs and financial, environmental, health, and learning benefits of sustainable school design in America over a twenty-year term.

Klatte, Maria, Jürgen Hellbrück, Jochen Seidel, and Philipp Leistner. “Effects of Classroom Acoustics on Performance and Well-Being in Elementary School Children.” *Environment and Behavior* 42.5 (2010): 659–692.

This field study examined the effect of classroom sound reverberation on the learning and well-being of 481 first- and second-grade children in Germany. Classrooms with higher reverberation rates were associated with lower performance on speech perception, short-term memory, and phonological processing tasks.
Matsuoka, Rodney. “Student Performance and High School Landscapes: Examining the Links.” Landscape and Urban Planning 97 (2010): 273–282.

Findings from this study of 101 Michigan public high schools suggest that the quality of classroom and cafeteria views may positively affect student learning and behavior. Views of trees and shrubs were associated with higher student test scores and graduation rates than views of lawns, athletic fields, or parking lots.

Mendell, Mark J., and Heath, Garvin A. “Do Indoor Pollutants and Thermal Conditions in Schools Influence Student Performance? A Critical Review of the Literature.” Indoor Air 15 (2005): 27–52.

This critical review of empirical research commissioned by the US Department of Education as part of the No Child Left Behind Act found that poor school environments, particularly those with poor air quality, adversely affect student health and learning.

PARTICIPATORY PRACTICES IN SCHOOL DESIGN

Recent literature on school design emphasizes the importance of student, teacher, staff, and community engagement as key to a successful school environment. Therefore, this subject is also covered in general texts on School Environments. Taylor 2009 and Woolner, et al. 2010 present specific methods to involve students, teachers, and staff in design processes.

Taylor, Anne. Linking Architecture and Education: Sustainable Design of Learning Environments. Albuquerque: University of New Mexico Press, 2009.

This book aims to provide a common language for design professionals and educators. It links educational goals and learning theories to design principles in numerous charts and graphics, providing an extensive resource for architects, administrators, educators, and anyone involved in school design.

Woolner, Pamela, Jill Clark, Elaine Hall, Lucy Tiplady, Ulrike Thomas, and Kate Wall. “Pictures Are Necessary but Not Sufficient: Using a Range of Visual Methods to Engage Users About School Design.” Learning Environments Research 13 (2010): 1–22.

Describes a field study where methods of photo elicitation, diamond ranking, and map-based activities were used with 1,100 students, teachers, and staff during the participatory design phase of a secondary school in England. Using multiple methods facilitated engagement from a broad range of stakeholders.

Gardens and School Ground Greening

Global warming and the international crisis of childhood obesity have provided impetus to daycare centers, schools, universities, and youth organizations to create gardens with young people, where they can engage directly in caring for the environment and for themselves through exercise and harvesting and eating the foods that they grow. Moore and Wong 1997 and Danks 2010 are two of the many books that advise how to start school ground gardens and provide extensive curricula. (“Greened” school grounds refers to those that have been naturalized with trees, shrubs, and a variety of plants rather than just turf.) A special issue of Children’s Environments (Hart 1995), Blair 2009, Ozer 2006, and Titman 1994 provide overviews of the many health and academic benefits that inspire the school garden and greening movement.
Blair, Dorothy. “The Child in the Garden, an Evaluative Review of the Benefits of School Gardening.” *Journal of Environmental Education* 40.2 (2009): 15–37.

Comprehensive review of US school garden literature, including quantitative and qualitative studies, the identification of existing statewide programs, and recommendations for improving research quality.

Danks, Sharon. *Asphalt to Ecosystems: Design Ideas for Schoolyard Transformation*. Oakland, CA: New Village Press, 2010.

A guidebook for designing and building naturalized schoolyards to connect children with the natural world while enhancing learning and play. For parents, teachers, school administrators, community volunteers, and designers. Case studies from Scandinavia, the United Kingdom, and North America.

Hart, Roger, ed. *Special Issue: Children’s Gardens and Children in Farming*. *Children’s Environments* 12.2 (1995).

 Entire journal issue focuses on youth in gardens and on farms in Tanzania, the United Kingdom, and the United States. Research on gardens’ meanings, curriculum integration, nutrition, and farming and sustainability, and a case study of an urban school.

Moore, Robin, and Herb Wong. *Natural Learning*. Berkeley, CA: MIG Communications, 1997.

An extended case study of the transformation of the schoolyard at Washington Elementary School in Berkeley, California, from asphalt to a microcosm of California ecosystems. A description of the participatory design process and how teachers used the new yard for teaching; children, for play.

Ozer, Emily. “The Effects of School Gardens on Students and Schools: Conceptualizations for Maximizing Healthy Development.” *Health Education Behavior* 34.6 (2006): 846–863.

A review of US-based school garden research on nutritional, academic, and social outcomes. It provides an ecological conceptual framework to guide further inquiry. Frames school gardens as systemic approaches to creating well-being and positive youth development.

Titman, Wendy. *Special Places, Special People: The Hidden Curriculum of School Grounds*. Winchester, UK: World Wildlife Fund UK / Learning Through Landscapes, 1994.

Seminal book uses semiotics and qualitative interviews with UK children to investigate the meaning and purpose of school grounds and relationships between the outdoor school environment and children’s feelings and behavior.

**SCHOOL GARDEN HISTORY**

School gardens have a long history that begins in the 19th century with Froebel’s kindergartens. They embody a variety of academic and social goals including improved nutrition, immigrant socialization and integration, health promotion through exercise, experiential learning for multiple subject matters, and food production for school and home. Hayden-Smith 2007 and Trelstad 1997 provide histories of school gardens in the United States, and Subramaniam 2002 covers international philosophies of school garden development.
Hayden-Smith, Rose. “Soldiers of the Soil: A Historical Review of the United States School Garden Army.” Applied Environmental Education and Communication 6 (2007): 19–29.

In World War I the Federal Bureau of Education in the United States launched the United States School Garden Army to engage youth in growing food for themselves and the nation. This article tells a fascinating story of how agricultural education was implemented nationwide and how much food children grew.

Subramaniam, Aarti. Garden-Based Learning in Basic Education: A Historical Review. 4H CYD Monograph. Davis: University of California at Davis, 2002.

International history of the educational philosophy of school garden development, which gives an overview of educational theory as it relates to experiential learning and gardens and looks at countries that include gardening in their schools’ curriculums.

Trelstad, Brian. “Little Machines in Their Gardens: A History of School Gardens in America, 1891 to 1920.” Landscape Journal 16.2 (1997): 161–173.

Explores US political and social forces, including progressive governance and the Back to Nature movement, propelling school garden development between 1891 and 1920 during a period of massive immigration, World War I, and internal rural the potential of-urban migration.

HEALTH, NUTRITION, AND PHYSICAL ACTIVITY

Gardening has the potential to affect youth nutrition, physical activity levels, and social and mental health. Bell and Dyment 2008 examines the potential of school gardens for holistic health promotion while supporting academic goals. Due to rising rates of childhood obesity, multiple interventions have used school gardens as a means of promoting better youth nutrition. Robinson-O’Brien, et al. 2009 reviews eleven studies that measured fruit and vegetable consumption after gardening and nutrition education.

Bell, Anne, and Janet Dyment. “Grounds for Health: The Intersection of Green School Grounds and Health-Promoting Schools.” Environmental Education Journal 14.1 (2008): 77–90.

This review examines the potential of green school grounds to promote student well-being, using the World Health Organization’s “Health Promoting Schools” philosophy, which sees the entire school environment as influencing student health. Calls for more longitudinal and comparative studies to identify the impacts of gardens on students.

Robinson-O’Brien, Ramona, Mary Story, and Stephanie Helm. “Impact of Garden-Based Youth Nutrition Intervention Programs: A Review.” Journal of the American Dietetic Association 109 (2009): 273–280.

Reviews eleven scientific studies published in the United States between 1990 and 2007 that are relevant to nutrition and school gardens with children aged five to fifteen. It identifies outcomes and makes research recommendations.

ACADEMIC ACHIEVEMENT AND ENVIRONMENTAL AWARENESS

Science is the primary subject integrated into gardening activities, and most of the quantitative studies examining student achievement measure science knowledge. Klemmer, et al. 2005 shows better science achievement when gardening reinforces science concepts.
Cammack, et al. 2002 examines the benefits of horticultural training for at-risk adolescents. According to McArthur, et al. 2010, gardening can be associated with a range of benefits, including improved school grades and behavior.

Cammack, Carol, Tina Waliczek, and Jayne Zajicek. “The Green Brigade: The Educational Effects of a Community-Based Horticultural Program on the Horticultural Knowledge and Environmental Attitude of Juvenile Offenders.” *Hort Technology* 12.1 (2002): 77–81.

This study with Hispanic and African American adolescents shows that for the juvenile offenders who attended 60 percent or more of their horticultural training and work sessions, their environmental attitudes and horticultural knowledge improved.

Klemmer, C. D., Tina Waliczek, and Jayne Zajicek. “Growing Minds: The Effect of a School Gardening Program on the Science Achievement of Elementary Students.” *Hort Technology* 15.3 (2005): 448–452.

Science learning achievement was measured with 647 students, grades 3 to 5, in 7 elementary schools in Texas. The experimental group learned science with experiential activities while gardening; the control group had the same curriculum without practical application in a garden. The experimental group had better retention of the science presented.

McArthur, Jaqueline, Walter Hill, Guy Trammel, and Carlton Morris. “Gardening with Youth as a Means of Developing Science, Work and Life Skills.” *Children, Youth and Environments* 20.1 (2010): 301–317.

Case study involves African American youth and children. Tuskegee University social-work students mentored fifty-five children aged five through thirteen in gardening. Qualitative interviews and children's school grades demonstrated that gardening with mentors positively influenced the children's behavior, learning, academic performance, and interest in science, agriculture, and the environment.

**PLAY AND SOCIAL INCLUSION**

Natural environments, including gardens, promote a wider range of play and exploration than hard-surfaced playgrounds. Research indicates school grounds that include gardens or natural spaces promote social inclusion by providing spaces where children can talk and play quietly (Samborski 2010). Community gardens offer similarly supportive environments for older youth (Hung 2004). Herrington 1997 (which reports on research conducted in a preschool), Cutter-Mackenzie 2009 (in an elementary school), and Dyment and Bell 2006 (in elementary and middle schools) demonstrate benefits for young people of different ages.

Cutter-Mackenzie, Amy. “Multicultural School Gardens: Creating Engaging Garden Spaces in Learning about Language, Culture, and Environment.” *Canadian Journal of Environmental Education* 14.1 (2009): 122–135.

Australian study at a low-income, multicultural elementary school engaged child researchers, including recent immigrants with minimal English, in journaling, photographing, and interviewing. Discovered multiple social benefits associated with planting, tending, and cooking food.

Dyment, Jane, and Anne Bell. “Our Garden Is Color Blind, Inclusive and Warm: Reflections on Green School Grounds and Social Inclusion.” *International Journal of Inclusive Education* 12.2 (2006): 1–15.

Dyment and Bell report improved child and child/adult social relationships as a result of elementary and middle-school greening in multicultural urban Toronto. The study involved a survey of forty-five schools and five elementary-school case studies.
Herrington, Susan. “The Received Value of Play and the Subculture of Infants.” *Landscape Journal* 16.2 (1997): 149–160. 
Describes redesigning a play yard to hold natural elements that promote physical, social, cognitive, and emotional development in infants, toddlers, and preschoolers. Video research analyzes child play, showing greater engagement with sensual environmental experiences, more extensive physical space use, and greatly increased social contacts.

Hung, Yvonne. “East New York Farms: Youth Participation in Community Development and Urban Agriculture.” *Children, Youth and Environments* 14.1 (2004): 20–31. 
Investigates African American and Latino older adolescents’ personal and collective development in relation to the local environment, showing how they contribute to their community and grow personally by collectively gardening in an urban food security program.

Samborski, Sylvia. “Biodiverse or Barren School Grounds: Their Effects on Children.” *Children, Youth and Environments* 20.2 (2010): 67–115. 
A comparison of two Canadian public schools with similar populations: one with a naturalized yard and one with conventional play equipment and turf. Using multiple methods, 349 students aged 6 to 13 indicated how they used and evaluated their school grounds. The biodiverse yard supported more opportunities for functional, constructive, and symbolic play.

**Child-Friendly Cities**

Child-Friendly Cities (CFCs) recognize that *place matters*—that where children grow up affects their development and access to life chances. CFCs seek to translate the 1989 United Nations Convention on the Rights of the Child (CRC) into principles and criteria for community planning and urban development. Within this normative framework, publications features of the emphasize physical environment (especially related to play, safety, and environmental health) and governance (especially related to youth participation in local decision making). Since children’s daily worlds do not coincide with the whole of a city, some authors prefer the term “child-friendly communities.” While various conceptualizations of CFCs exist, the rights-based perspective developed under the auspices of the CFC Secretariat in Florence, Italy (UNICEF Innocenti Research Centre 2004), has been most influential. Riggio 2002 provides a brief overview. Bridgman 2004 and Horelli 2007 suggest best practices for CFCs. Principles of CFCs inform some publications that address Environments of Risk, especially related to Poverty and Inequality.

Bridgman, Rae. “Criteria for Best Practices in Building Child-Friendly Cities: Involving Young People in Urban Planning and Design.” *Canadian Journal of Urban Research* 13.2 (2004): 337–346. 
Proposes protocol for documenting best practices in CFCs—including young people’s participation, goals of fostering independence and recognizing diversity among young people, safety and security, innovative use of existing resources, operational sustainability, replicability, and implementation processes and structures.

Horelli, Liisa. “Constructing a Framework for Environmental Child-Friendliness.” *Children, Youth and Environments* 17.4 (2007): 267–292. 
Presents criteria of child friendliness, based on studies in Finland, Italy, Sweden, and other European examples. Identifies ten normative
dimensions and suggests that planners and designers should consider environmental impacts on individuals as well as on groups. Emphasizes importance of culture-sensitive participatory planning.

Riggio, Eliana. “Child Friendly Cities: Good Governance in the Best Interests of the Child.” *Environment and Urbanization* 14.2 (2002): 45–58.

Describes principles that make cities “child friendly” and the legal, institutional, budgetary, and planning measures underpinning them, using examples from around the world. Reviews how the CFC concept developed and its key role in ensuring the implementation of the UN Convention on the Rights of the Child.

**UNICEF Innocenti Research Centre. Building Child Friendly Cities: A Framework for Action.** Florence: UNICEF Innocenti Research Centre, 2004.

Provides a framework for defining and developing a CFC. Identifies steps to build a local system of governance committed to fulfilling children’s rights. Intended to provide a foundation for adaptation to suit all types of localities.

**GOVERNANCE AND PLANNING**

Fundamentally, two approaches exist to address children’s needs in local planning. The first involves judgment and action by expert adults who identify needs and then deliver services and create environments to meet those needs. The second recognizes children’s right to have their voices heard on all matters that affect them, including their community and physical environment. Accordingly, the second uses methods intended to enable children to represent their interests in local planning and urban development. Bartlett 2005 reviews the potentially complementary but sometimes conflicting relations between these approaches. Miller and Bishop 2002 and MacNab 2010 provide tools for students and community groups for engaging young people. More tools are presented in *Children’s Participation in Environmental Design and Decision Making*.

Bartlett, Sheridan. “Integrating Children’s Rights into Municipal Action: A Review of Progress and Lessons Learned.” *Children, Youth and Environments* 15.2 (2005): 18–40.

Reviews implementation of initiatives for children and their place in local planning, regulatory processes, budgeting, data collection, and capacity building. It finds more interest in showcase projects than in broader changes in awareness and inclusion, more interest in project development than in details of sustaining projects, and little attention to monitoring, evaluation, and child impact assessment.

**MacNab, Maddy. Youth Friendly Community: Good Practices 2010.** Toronto: Play Works Partnership, 2010.

Annual publication of a Canadian group of not-for-profit organizations. Aims to support communities in creating environments that support youth growth and development through play. Documents good community practices as a practical guide within each of sixteen categories defined by CFC criteria.

**Miller, Elisabeth, and Mary Bishop. A Kid’s Guide to Building Great Communities: A Manual for Planners and Educators.** Ottawa, ON: Canadian Institute of Planners, 2002.

Guide with thirty-four exercises and activities introducing K–12 students to their community. Topics include tried-and-true resources (Kids City) and more out-of-the-ordinary ones (“Graveyard as an Educational Tool”).

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COMMUNITIES AND NEIGHBORHOODS

Although some cities do adopt citywide CFC policies (e.g., free or low-cost public transportation), for many children the local community or neighborhood is the most important context for their everyday lives. At this scale, the literature gives less attention to aspects of governance and places more emphasis on aspects of the physical environment related to housing, schools, streets, and other public spaces. Racelis and Aguirre 2005 reports on work at this scale with children in informal settlements. Gill 2006, Gleeson and Sipe 2006, and Whitzman and Worthington 2010 discuss initiatives at different scales to provide urban structures that support children’s development. Christensen and O’Brien 2003 describes children’s experiences of cities. Van Vliet 1981 remains a model for research to evaluate whether cities are child friendly.

Christensen, Pia, and Margaret O’Brien, eds. *Children in the City: Home, Neighborhood and Community*. London: Routledge 2003.

Drawing chiefly from Western countries, chapters discuss children’s experiences and activities in cities. Authors emphasize themes related to inclusivity, the interweaving of social and physical aspects of children’s environments, and children’s roles in processes of urban change.

Gill, Tim. “Home Zones in the UK: History, Policy and Impact on Children and Youth.” *Children, Youth and Environments* 16.1 (2006): 90–103.

Describes home zones in the United Kingdom, outlining their background and links to the Dutch woonerf model. It reviews the implementation of the underlying legal and design principles and discusses their impact on children, as well as raising questions about children’s stake in society and the built environment.

Gleeson, Brendan, and Neil Sipe, eds. *Creating Child Friendly Cities: Reinstating Kids in the City*. London: Routledge, 2006.

Examines how social and physical environments of cities support children’s and young people’s needs. Targets planners, designers, and policymakers in housing and transportation. Heavily oriented toward Australia and New Zealand, with further references to other Western countries.

Racelis, Mary, and Angela Aguirre. *Making Philippine Cities Child Friendly: Voices of Children in Poor Communities*. Florence: UNICEF Innocenti Research Centre, 2005.

Combines secondary data with information from focus groups with four- to seventeen-year-old children in five Philippine informal settlements to examine fulfillment of rights to survival, development, protection, and participation. Offers implementation recommendations for civil society organizations, and national and local government.

van Vliet, Willem. “Neighborhood Evaluations by City and Suburban Children.” *Journal of the American Planning Association* 47.4 (1981): 458–466.

Study broke new ground by showing the practical applicability of environment-behavior research to planning child-friendly neighborhoods. Found links between *specific* environmental characteristics (e.g., child density, land uses) and *specific* aspects of children’s use, evaluation, and knowledge of city and suburban environments (e.g., friendships).
Whitzman, Carolyn, and Megan Worthington. “The Journey and the Destination Matter: Child-Friendly Cities and Children’s Right to the City.” *Built Environment* 36.4 (2010): 474–486.

Analyzes five local government CFC initiatives in Victoria, Australia, to support children’s independent mobility. Favors focus on children’s right to public space over more-limited public-health approaches to mitigate traffic and stranger danger. Finds barriers in moving from social and health planning to impacts on land-use planning policies and practices.

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Environments of Risk

The Convention on the Rights of the Child (CRC) includes rights to protection from all forms of child abuse, neglect, and exploitation. It involves physical safety and social security and includes opportunities for children to safely walk on their own in their community, without fear of crime or traffic dangers, to live in an unpolluted environment, to meet friends, to play safely, and to have safe havens in times of trouble. The literature often presents a view of children as passive victims and in need of benefactors administering supportive interventions. However, rights-based approaches recognize children as active participants and valued partners in efforts to address exposure to adverse environmental impacts. The CRC is, therefore, a useful framework for dealing with environments that place children at unacceptable risk. Commonly, risks are conceived as environmental hazards and violence, a position evident in Satterthwaite, et al. 1996; Wigle 2003; and Landrigan, et al. 2006, and consistent with several texts in General Overviews of children and environments and Impacts of Home Environments on Health and Well-Being. In this context, Towner and Towner 2009 discusses changing patterns of child injury. Garbarino 2001 and Johnson 2009 focus on issues related to violence, while Peek 2008 introduces a special journal issue on children in natural disasters, and Bartlett and Iltus 2007 presents a model for reconstruction after disasters.

Bartlett, Sheridan, and Selim Iltus. *Making Space for Children: Planning for Post-Disaster Reconstruction with Children and Their Families*. Chennai, India: Save the Children, 2007.

Handbook aims at contributing to programs of disaster response recovery focused on rebuilding physical environments and strengthening community capacity for action. Documents and draws lessons from child and adult participation in the reconstruction of their communities following the 2004 tsunami in South Asia.

Garbarino, James. “An Ecological Perspective on the Effects of Violence on Children.” *Journal of Community Psychology* 29.3 (2001): 361–378.

Examines processes and conditions that transform violence into developmental harm, using an ecological framework for understanding child and youth development and an accumulation-of-risk model for understanding how and when children suffer the most-adverse consequences of exposure to community violence, exceeding their limits of resilience.

Johnson, Sarah. “Improving the School Environment to Reduce School Violence: A Review of the Literature.” *Journal of School Health* 79.10 (2009): 451–465.

Review finds less school violence when students know school rules and judge them fair, enjoy positive relationships with teachers, feel a sense of ownership in their school, and experience an orderly, learning-oriented school environment. School environments offer intervention opportunities, but environmental diversity and lack of longitudinal and experimental research limit applicability of recommendations.
Landrigan, Philip, Leonardo Trasande, Lorna Thorpe, et al. “The National Children’s Study: A 21-Year Prospective Study of 100,000 American Children.” *Pediatrics* 118.5 (2006): 2173–2186.

Gathers environmental risks and individual susceptibility data for a nationally representative cohort of US-born children, from conception to age twenty-one, to guide development of a comprehensive blueprint for child disease prevention. Assesses environmental exposures during pregnancy and throughout childhood in homes, schools, and communities. Explores methodological, etiologic, and intervention issues for environmental pediatricians.

Peek, Lori. “Children and Disasters: Understanding Vulnerability, Developing Capacities, and Promoting Resilience—An Introduction.” *Children, Youth and Environments* 18.1 (2008): 1–29.

Literature review and introduction to a special journal issue on children in disasters. As the frequency and intensity of disasters increase, children are especially at risk. They may require different forms of support but can also contribute to disaster preparedness, response, and recovery. Discusses ways to promote children’s resilience to disasters.

Satterthwaite, David, Roger Hart, Caren Levy, et al. *The Environment for Children: Understanding and Acting on the Environmental Hazards That Threaten Children and their Parents*. London: Earthscan, 1996.

Global review of environmental health hazards and their impacts on children. Argues that environmental causes can often be treated straightforwardly and at low cost, such as poor drinking water or food or controllable infectious diseases. Discusses appropriate actions. However, local governments and aid agencies rarely give children’s well-being priority.

Towner, Elizabeth, and John Towner. “Child Injury in a Changing World.” *Global Public Health* 4.4 (2009): 402–413.

Examines changes in child injury patterns owing to globalization, urbanization, motorization, and environmental change. Considers implications for public health policy.

Wigle, Donald. *Child Health and the Environment*. New York: Oxford University Press, 2003.

Comprehensive text on environmental threats to children, including sources, exposures, specific pathways, and health effects. Limited to air, food, and water contaminants; radiation; toxic chemicals; and wastes. Does not consider built environment (e.g., land use). For practitioners, risk assessors, policymakers in public health, and others interested in vulnerability and risk management.

**POVERTY AND INEQUALITY**

Poverty is antecedent to many risks to children’s well-being and ability to thrive. Poverty has economic, legal, social, psychological, and environmental dimensions. These characteristics are contextual—that is, *there are children living in poverty, but there are no poor children*. The difference has important implications for efforts to eradicate poverty, redirecting attention away from a misplaced focus on children to a concern with environmental variables. Nandy and Gordon 2009; Bolte, et al. 2010; and Boyden and Bourdillon 2011 apply this perspective to international contexts. Evans 2004 documents the burden of multiple risks in environments of poverty. Bartlett, et al. 1999 and Bernard van Leer Foundation 2010 present approaches to provide support for children in conditions of urban poverty. One of the most extreme consequences of poverty is homelessness, which stands out for its far-reaching impacts on children’s physical and emotional health. This theme is introduced in a special issue of *Children, Youth and Environments* (Ennew and Swart-Kruger 2003).
Bartlett, Sheridan, Roger Hart, David Satterthwaite, Ximena de la Barra, and Alfredo Missair. *Cities for Children: Children’s Rights, Poverty and Urban Management*. London: Earthscan, 1999.

Source book of practical measures for local governments and their partners to improve urban environments for children, in the context of scarce resources. Emphasizes rights-based approaches that recognize children and their families as active participants. Covers prenatal and birthing environments, housing, schools, community, childcare, juvenile justice, and street-based and working children.

Bernard van Leer Foundation, ed. 2010. *Special Issue: Young Children in Cities: Challenges and Opportunities. Early Childhood Matters* 115 (2010).

Collection of eleven essays on ways of improving children’s health and nutrition by interventions in the physical environments they grow up in. Aims to bring together research and practice to create supportive policies and programs. Contributions cover various cities in high- and low-income countries.

Bolte, Gabriele, Giorgio Tamburlini, and Martina Kohlhuber. “Environmental Inequalities among Children in Europe—Evaluation of Scientific Evidence and Policy Implications.” *European Journal of Public Health* 20.1 (2010): 14–20.

Reviews environmental inequalities among children in Europe. Discusses policy implications. Low socioeconomic position is associated with increased exposure to traffic-related air pollution, noise, lead, environmental tobacco smoke, inadequate housing, and fewer opportunities for physical activity. Policy priority must aim at removing socially determined differences in environmental conditions.

Boyden, Jo, and Michael Bourdillon. *Childhood Poverty: Multidisciplinary Approaches in Young Lives*. London: Palgrave Macmillan, 2011.

Based on a mixed-methods interdisciplinary study of causes, experiences, and trajectories of childhood poverty involving twelve thousand children at eighty sites in Ethiopia, India, Peru, and Vietnam over fifteen years. Examines anti poverty policies and inequalities in view of children’s rights and their cultural context to support interventions based on evidence, rather than assumed norms.

Ennew, Judith, and Jill Swart-Kruger, eds. *Special Issue: Street Children*. *Children, Youth and Environments* 13.1 (2003).

Special issue with a comprehensive introductory review and more than twenty articles and field reports from around the world. Establishes that street children are not a homogeneous group, describes consequences of homelessness for children, identifies promising strategies and programs, and documents examples of children’s agency in addressing homelessness.

Evans, Gary. “The Environment of Childhood Poverty.” *American Psychologist* 59 (2004): 77–92.

This review of research argues that a confluence of multiple demands from the psychosocial and physical environment of poverty leads to physical and psychological morbidity among low-income children. It suggests that an accumulation of multiple risks rather than singular risk exposure is an especially pathogenic aspect of childhood poverty.

Nandy, Shailen, and David Gordon. “Children Living in Squalor: Shelter, Water and Sanitation Deprivations in Developing Countries.” *Children, Youth and Environments* 19.2 (2009): 202–228.
Part of a special issue on measurement and impacts of everyday environments of poverty on children and implications for policy and practice. Anti-poverty policies for children target human capital interventions aimed at the future (e.g., improved schooling), whereas countless children in developing countries are growing up in squalid conditions that require attention now.

RESILIENCE AND RISK AS DEVELOPMENTAL OPPORTUNITIES

While we must prevent situations that put children at risk for harmful outcomes, we must also avoid creating sterile environments and ensure opportunities for exploration and use of “loose parts” and “wasted space.” Planners and designers must acknowledge that children are resourceful and resilient and that certain risks represent developmentally beneficial challenges. Gill 2007 argues that childhood is undermined by excessive risk aversion, whereas children need a balance between safety and challenge. Gärling and Valsiner 1985 applies this philosophy to accident prevention, while Little and Wyver 2008 comments on outdoor play. Ungar and Liebenberg 2011 describes a measure for assessing support for child and youth resilience.

Gärling, Tommy, and Jaan Valsiner, eds. Children within Environments: Toward a Psychology of Accident Prevention. New York: Plenum, 1985.

This academic collection makes the case that the effective prevention of child injuries in and around the home needs to be based on an understanding of children’s developing capabilities and family dynamics. It suggests how to minimize risks of serious harm without limiting children’s opportunities to gain competence.

Gill, Tim. No Fear: Growing Up in a Risk Aversive Society. London: Calouste Gulbenkian Foundation, 2007.

The growth of risk aversion restricts children’s play, limits their freedom of movement, corrodes their relationships with adults, and constrains their exploration of physical, social, and virtual worlds. Gill advocates a philosophy of resilience to strike a balance between protecting children from threats and giving them challenging opportunities through which to learn and grow.

Little, Helen, and Shirley Wyver. “Outdoor Play: Does Avoiding the Risks Reduce the Benefits?” Australian Journal of Early Childhood 33.2 (2008): 33–40.

This review argues that healthful growth and development require experiences involving physical risk. Social, institutional, and educational factors pressure early childhood staff to eliminate or minimize such experiences. Parents, teachers, and play workers should provide outdoor environments that reduce risks of serious injury but support creativity, challenge, and excitement.

Ungar, Michael, and Linda Liebenberg. “Assessing Resilience Across Cultures Using Mixed-Methods: Construction of the Child and Youth Resilience Measure.” Journal of Mixed-Methods Research 5.2 (2011): 126–149.

Looking beyond individual factors, investigators in eleven countries offer a measure of youth resilience focused on family, community, school, and the wider environment. Using quantitative administration with 1,451 youths and qualitative interviews with 89 youths to facilitate understanding of common and unique aspects across settings, a pilot study indicated that the measure has cross-cultural validity.

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Children’s Participation in Environmental Design and Decision Making

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The United Nations Convention on the Rights of the Child (CRC) provided a new foundation for children’s participation in environmental design and decision making, which is reflected in the literature on this topic. Most of the theoretical literature supports the rights of children to freely express their views and give input into decisions that affect them, as well as the potential benefit children can gain from participating. Hart 1997 (adapting Arnstein 1969) introduced the influential model of a “ladder of children’s participation” and provided international examples of good practice. Shier 2001, Francis and Lorenzo 2002, and Knowles-Yánez 2005 propose other typologies for categorizing approaches to participation. Percy-Smith and Thomas 2010 presents the history of participation, approaches used, and theoretical perspectives, with an emphasis on practice in Europe and Australia. Cahill and Hart 2006 presents discussions and examples of participation from around the world. In the context of specific settings, child participation is also discussed under Participatory Practices in School Design and Child-Friendly Cities.

Arnstein, Sherry. “A Ladder of Citizen Participation.” *Journal of the American Institute of Planning* 35.4 (1969): 216–224.
Arnstein identifies a typology of citizen participation ranging from non participation to citizen power. Although the focus is not on children, this theoretical work is often cited as a key article in support of citizen participation and directly influenced some later authors who focused specifically on young people.

Cahill, Caitlin, and Roger Hart, eds. *Special Issue: Pushing the Boundaries: Critical International Perspectives on Child and Youth Participation. Children, Youth and Environments* 16.2 (2006).
The first of four successive special issues on the theme of young people’s participation in local governance. Nearly one hundred articles from thirty-seven countries—by researchers, practitioners, and a few young people themselves—report effective models, theoretical perspectives, and analytical syntheses.

Francis, Mark, and Lorenzo, Ray. “Seven Realms of Children’s Participation.” *Journal of Environmental Psychology* 22 (2002): 157–169.
Presents an overview of children’s participation in city design and planning, in the context of research and practice. It creates a typology of this work and provides details for seven distinct realms, such as a romantic, advocacy, and needs realm.

Hart, Roger. *Children’s Participation: The Theory and Practice of Involving Young Citizens in Community Development and Environmental Care.* London: Earthscan, 1997.
Hart discusses the theoretical framework for involving young people in environmental efforts, providing the “ladder of children’s participation” as a model. This book provides specific examples of participatory projects around the globe, as well as methods that can be used by researchers and community development practitioners. An essential handbook.

Knowles-Yánez, Kimberley. “Children’s Participation in Planning Processes.” *Journal of Planning Literature* 20.1 (2005): 3–14.
A comprehensive overview of the participation literature within the context of land-use planning. This review divides children’s participation into four basic approaches: scholarly, practice, educational, and rights based. It concludes with recommendations for a new holistic approach.

Percy-Smith, Barry, and Nigel Thomas, eds. *A Handbook of Children and Young People’s Participation: Perspectives from*
Theory and Practice. New York: Routledge, 2010.

This edited volume presents chapters written by an international group of researchers concentrated primarily in Europe and Australia. The chapters are divided into three sections: the context and history of participation, methods and approaches used in participatory projects, and new theoretical perspectives.

Shier, Henry. “Pathways to Participation: Openings, Opportunities, Obligations.” Children & Society 15.2 (2001): 107–117.

Contributing to the theory of children’s participation, Shier presents an alternative model to Hart’s ladder of participation that includes five distinct levels (see Hart 1997). This article includes fifteen questions that adults working with children can use to create an action plan for meaningful participation.

IMPLEMENTING PARTICIPATION

Most of the texts under Children’s Participation in Environmental Design and Decision-Making discuss approaches and tools for implementing participatory practices with children. The publications listed here are either manuals with step-by-step directions for methods for engaging children in planning and design (Driskell 2002) or handbooks and reports intended for the use of government bodies and community organizations (Bell, et al. 2008; Kirby, et al. 2003). Breitbart 1995 and Chawla 2002 offer detailed case studies of implementation, analyzing reasons for success or failure.

Bell, Johanna, Ariadne Vromen, and Philippa Collin. Rewriting the Rules for Youth Participation: Inclusion and Diversity in Government and Community Decision-Making. Canberra: DEEWR, Commonwealth of Australia, 2008.

This comprehensive report presents research conducted in Australia to determine if current opportunities for participation are accessible and effective to a diverse group of children. Commissioned by the National Youth Affairs Research Scheme, the report includes a literature review, eleven case studies, and recommendations for policy and practice.

Breitbart, Myrna. “Banners for the Street: Reclaiming Space and Designing Change with Urban Youth.” Journal of Planning Education and Research 15 (1995): 35–49.

Describes a participatory-action research project with teens in a low-income neighborhood in Holyoke, Massachusetts, and provides an inspiring example of using multiple methods with children to assess the conditions of their community.

Chawla, Louise, ed. Growing Up in an Urbanising World. London: Earthscan, 2002.

Describes the Growing Up in Cities initiative, an international example of children’s participation in community development. Leading experts present projects in eight different countries to improve participatory policies and practices and to understand how young people evaluate conditions that create good or bad communities to grow up in.

Driskell, David. Creating Better Cities with Children and Youth: A Manual for Participation. London: Earthscan, 2002.

Driskell describes the theoretical underpinnings of numerous participatory methods used during the Growing Up in Cities initiative to involve children and youth in community decision making. The manual includes a clear description of how and when to facilitate each method.
Kirby, Perpetua, Claire Lanyon, Kathleen Cronin, and Ruth Sinclair. *Building a Culture of Participation: Involving Children and Young People in Policy, Service Planning, Delivery and Evaluation*. Nottingham, UK: Department of Education and Skills, 2003.

Report and handbook commissioned by the National Children’s Bureau in the United Kingdom to examine the participatory practices of twenty-nine organizations and identify factors that promote good outcomes and ways of developing participatory organizations. Useful recommendations based on case study findings.

### EVALUATING PARTICIPATION

Many authors have raised questions about the effectiveness of participatory processes at reaching meaningful levels of involvement and realizing benefits for children. London 2007 questions the inclusivity of participatory practices, and Hill, et al. 2004 and Barber 2009 critically evaluate policy and theory. In addition, much of the literature on children’s participation recognizes the importance of child development, with the consequence that adults must consider the varying developmental stages of potential participants. Chawla 2001 discusses this principle in proposing criteria for evaluation.

Barber, Terry. “Participation, Citizenship, and Well-Being: Engaging with Young People, Making a Difference.” *Young: Nordic Journal of Youth Research* 17.1 (2009): 25–40.

Focuses on participation in relation to democratic citizenship and well-being and provides a critical overview of various models of participation. Barber challenges some of the participation rhetoric and calls for a more honest evaluation of participation as “consultation” with children as consumers of service.

Chawla, Louise. “Evaluating Children’s Participation: Seeking Areas of Consensus.” *PLA Notes* 42 (2001): 9–13.

Reviews insights on children’s participation, by some of the world’s leading experts, highlighting areas of consensus and debate. Chawla provides an introduction to participation theory and contributes concise overviews of characteristics and expected outcomes of participation. This journal is now published as *Participatory Learning and Action*.

Hill, Malcolm, John Davis, Alan Prout, and Kay Tisdall. “Moving the Participation Agenda Forward.” *Children & Society* 18 (2004): 77–96.

The introduction to a special issue of *Children & Society* focusing on social exclusion/inclusion. The authors express concerns about the limited impact that participatory measures have had in the United Kingdom and propose several principles on which to establish an agenda for policy, practice, and research.

London, Jonathon. “Power and Pitfalls of Youth Participation in Community-Based Action Research.” *Children, Youth and Environments* 17.2 (2007): 406–432.

Describes a case study in San Francisco that evaluates the impact of participation on youth and the community. To assess the quality of participation processes and provide a tool for future research, London creates a series of matrices that pair levels of participation with organizational capacity.
