

UNIVERSITY OF MINNESOTA



THE 2007 TUCKER CENTER RESEARCH REPORT

Developing Physically Active Girls

An Evidence-based Multidisciplinary Approach



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An Evidence-based Multidisciplinary Approach



Tucker Center for Research
on Girls & Women in Sport

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COLLEGE OF EDUCATION
+ HUMAN DEVELOPMENT

UNIVERSITY OF MINNESOTA

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Developing Physically Active Girls: An Evidence-based Multidisciplinary Approach
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The 2007 Tucker Center Research Report

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Message from Robert H. Bruininks president, University of Minnesota

The Tucker Center for Research on Girls & Women in Sport was established in 1993 with a generous gift from Dr. Dorothy McNeill Tucker, a 1945 graduate of the University of Minnesota's College of Education and Human Development. I served as Dean of that College from 1991 to 1997 and was deeply involved in—and committed to—the vision and leadership of this extraordinary Center, the only university-based interdisciplinary research center in the nation devoted to exploring how sport and physical activity impact the lives of girls and women, their families, and communities. I was also the Dean when, in 1997, the Tucker Center embarked on a unique collaboration with the President's Council on Physical Fitness and Sports and produced the groundbreaking report—*Physical Activity & Sport in the Lives of Girls: Physical and Mental Health Dimensions from an Interdisciplinary Approach*.

The Tucker Center was launched just after the 20th anniversary of Title IX, landmark federal legislation passed in 1972 which prohibits gender discrimination in educational settings. Nowhere has Title IX had a greater impact than in the world of sports. During the last three decades, women's participation in sport and physical activity has been unprecedented. Before Title IX, 300,000 females were involved in organized sport nationwide, but as we celebrated its 35th anniversary this past June, those figures had skyrocketed to over 3 million. In spite of this dramatic increase, the scientific study of this historic development was lagging behind. What was needed was a place in higher education that would promote the interdisciplinary study of females' engagement in sport and physical activity—from exercise science to health promotion and disease prevention to social and psychological development.

The Tucker Center in general, and the President's Council's report in particular, made enormous contributions toward that effort. From the 1997 report we learned that:

- Participation in exercise and sport can enhance mental health by offering adolescent girls positive feelings about their body image, tangible experiences of competency, and increased self-confidence.
- Regular physical activity can reduce girls' risk for obesity and build greater peak bone mass thereby reducing adult risk for osteoporosis.

- Sports are an educational asset in girls' lives: High-school female athletes have lower dropout rates and are more likely to go on to college than are their nonathletic counterparts.

Unfortunately, we also learned that:

- Adolescent females are only half as likely as adolescent males to be physically active.
- Excessive exercise and certain forms of athletic participation are associated with a higher prevalence of eating disorders.
- Girls from economically disadvantaged backgrounds, a disproportionate number of whom are girls of color, face unique obstacles gaining access to sports, especially organized competitive sports.

The 1997 report had a significant impact on organizations, educational institutions, and individuals working in classrooms, athletic fields, and recreation centers across the United States and around the globe. Athletic administrators, coaches, parents, and policy makers—not to mention girls themselves—used the original report as a valuable resource that stimulated thought and provided scientific evidence regarding the various ways engagement in sport and physical activity make a difference in girls' lives. Fast forward to 2007, the 10th anniversary of the original report. Given the critical importance that sport and physical activity play in the lives of young girls, it was imperative that the Tucker Center produce a follow-up report that once again focuses on the “complete girl,” a focus which recognizes that physical activity does not operate in a vacuum and impacts all aspects of a girl's life.

The 2007 Tucker Center Research Report makes clear that girls continue to achieve numerous health benefits from regular physical activity, ranging from reduced risks for cardiovascular disease, obesity, and osteoporosis, to increased levels of self-esteem, cognitive development, and quality peer relationships. But as was the case 10 years earlier, despite these many benefits, girls—especially adolescent girls—comprise an at-risk group for achieving adequate physical activity. Unfortunately, at precisely the moment these girls have the most to gain physically, socially, and psychologically, they become significantly less physically active. Why is this the case and what can be done about it? The answer to these and other pressing questions are addressed throughout this 10-year update by some of our nation's leading scholars.

The University of Minnesota is proud to be a part of this important initiative. As one of the leading research and educational institutions in this country, we have long been aware of the advantages of physical activity in the lives of all our citizens, especially girls. And we applaud the Tucker Center for once again leading the way on this most important endeavor.

Sincerely,

Robert H. Bruininks

Message from Darlyne Bailey *dean, College of Education and Human Development*

The mission of the new College of Education and Human Development at the University of Minnesota is to be “a world leader in discovering, creating, sharing, and applying principles and practices of multiculturalism and multidisciplinary scholarship to advance teaching and learning and to enhance the psychological, physical, and social development of children, youth, and adults across the lifespan in families, organizations, and communities.” One of the most important places that best embodies this mission—in both principle and practice—is the Tucker Center for Research on Girls & Women in Sport.

Before I came to the University as the dean of this new and transformative College, I heard about the Tucker Center. My initial reaction was “Yes!”; finally a university has stepped up to start from the “anecdotal” evidence (like my sister continues to do as a veteran middle-school physical education teacher and coach) to provide empirical support of the importance of the mind-body connection. And now after living in our College with my center colleagues for over a year, I proudly say “Yes!” again.

To actively enable the rest of the College to also live into our mission we developed “Neighborhoods”—a propelling strategy that brings together all that we do as faculty, staff, and students to fulfill our vision and aspirations. These neighborhoods exist within and across all our departments and centers. One such neighborhood involves psychological, physical, and social development whereby scientific knowledge and applications of evidenced-based practices advance, promote, and nurture the health and well-being of all of our citizens. I was thrilled to discover that the Tucker Center’s 1997 collaboration with the President’s Council on Physical Fitness and Sports—*Physical Activity & Sport in the Lives of Girls: Physical and Mental Health Dimensions from an Interdisciplinary Approach*—embraced a similar commitment and philosophy. What most impressed me was one of the report’s key findings: That young girls face particular challenges and barriers when it comes to accruing the many benefits derived from physical activity and, as I again knew from my own family, this is especially true for girls of color. I was equally impressed with the report’s focus on connecting research-based knowledge to strategies and practices which ensures that every girl has ample opportunity to fully engage in physical activity and sport, and that to create

such a climate requires all of us—from parents to teachers to policy makers to community activists—to do our fair share.

My “fair share” is to say that *The 2007 Tucker Center Research Report* once again provides the latest and most significant multidisciplinary research findings on the critical role sport and physical activity play in all aspects of a young girl’s life. Throughout this latest report, whether addressing the psychological, sociological, or physiological aspects of physical activity, one theme emerges: Involvement in sport and physical activity is not an “add-on,” but rather a core value and requirement for healthy and effective living. With this key piece of knowledge in mind, we must all recognize how important it is to create structures, policies, and practices that maximize getting—and keeping—girls physically active. This report goes a long way toward ensuring this most worthy goal.

On behalf of all of my colleagues at our College of Education and Human Development, I want to applaud the efforts of the Tucker Center for helping us understand that girls’ engagement with sport and physical activity, from our most affluent to our most underserved communities, is about so much more than who can run the fastest, jump the highest, or score the most points. It is about seeing and living physical activity as a vehicle for educational opportunity, a path to health and wellness, and a prescription for ensuring that every girl reaches her full potential.

Well done, Tucker Center!

Best regards,

Darlyne Bailey

Acknowledgments

MISSION STATEMENT OF THE UNIVERSITY OF MINNESOTA

The University of Minnesota, founded in the belief that all people are enriched by understanding, is dedicated to the advancement of learning and the search for truth; to the sharing of this knowledge through education for a diverse community; and to the application of this knowledge to benefit the people of the state, the nation, and the world. The University's mission, carried out on multiple campuses and throughout the state, is threefold:

Research and Discovery

Generate and preserve knowledge, understanding, and creativity by conducting high-quality research, scholarship, and artistic activity that benefit students, scholars, and communities across the state, the nation, and the world.

Teaching and Learning

Share that knowledge, understanding, and creativity by providing a broad range of educational programs in a strong and diverse community of learners and teachers, and prepare graduate, professional, and undergraduate students, as well as non-degree-seeking students interested in continuing education and lifelong learning, for active roles in a multiracial and multicultural world.

Outreach and Public Service

Extend, apply, and exchange knowledge between the University and society by applying scholarly expertise to community problems, by helping organizations and individuals respond to their changing environments, and by making the knowledge and resources created and preserved at the University accessible to the citizens of the state, the nation, and the world.

In all of its activities, the University strives to sustain an open exchange of ideas in an environment that embodies the values of academic freedom, responsibility, integrity, and cooperation; that provides an atmosphere of mutual respect, free from racism, sexism, and other forms of prejudice and intolerance; that assists individuals, institutions, and communities in responding to a continuously changing world; that is conscious of and responsive to the needs of the many communities it is committed to serving; that creates and supports partnerships within the University, with other educational systems and institutions, and with communities to achieve common goals; and that inspires, sets high expectations for, and empowers individuals within its community.

MISSION STATEMENT OF THE COLLEGE OF EDUCATION AND HUMAN DEVELOPMENT

The College of Education and Human Development is a world leader in discovering, creating, sharing, and applying principles and practices of multiculturalism and multidisciplinary scholarship to advance teaching and learning and to enhance the psychological, physical, and social development of children, youth, and adults across the lifespan in families, organizations, and communities.

MISSION STATEMENT OF THE TUCKER CENTER

The first and only one of its kind in the world, the Tucker Center is an interdisciplinary research center leading a pioneering effort to examine how sport and physical activity affect the lives of girls and women, their families, and communities. Research has discovered important connections between participation in sport and physical activity and healthy development, yet most sports-related research has focused on males. The Tucker Center is changing this by exploring how sport and exercise influence women's physical, psychological, and social development, as well as how social, cultural, and economic factors influence girls' and women's participation in sports, recreation, and physical activity.

The Tucker Center has three equal and interrelated goals:

- *Collaborative research:* Our affiliated scholars work as interdisciplinary research teams focused on cutting-edge issues, challenges, and opportunities within sports contexts.
- *Research that counts:* We focus on research that directly impacts the experience of girls and women, their families, and communities within sports, recreation, and physical activity settings.
- *Education:* Community outreach, civic engagement, and teaching and mentoring students are important components of the Tucker Center. We sponsor a Distinguished Lecture Series in which nationally recognized scholars and educators share their findings and insights with policymakers, students, and families. We also develop educational materials and serve as a resource center for private and public organizations, educational institutions, media outlets, and the general public.

ORIGINAL REPORT

We would like to offer thanks to the contributors to the original report: Don Sabo, D'Youville College; Deborah Slaner Larkin, National Women's Law Center; and Sandra Perlmutter, Georgetown University Hospital.

Additional thanks also goes to the authors of the original report: Linda K. Bunker, formerly of the University of Virginia; Margaret Carlisle Duncan, University of Wisconsin—Milwaukee; Patty Freedson, University of Massachusetts Amherst; Doreen Greenberg, Farleigh Dickinson University; Carol Oglesby, University of California, Northridge; and Diane Wiese-Bjornstal, University of Minnesota.

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This comprehensive report is funded by private donations. The project directors are grateful to those who have contributed to this 10-year update for their support in making it possible. This support enables us to provide information to educators and decision makers who are in a position to make a difference in the lives of girls across the country. We would like to extend specific thanks to the following generous donors: Mary Beth Barry, Debra Noll, Sandy Peterson, Lauren Weck, and The Women’s Philanthropic Leadership Circle.

ADVISORY PANEL

We would also like to extend our thanks to our panel of advisors, all from the University of Minnesota: Marta Fahrenz, communications director, School of Kinesiology; Doug Hartmann, associate professor, Department of Sociology; Arthur S. Leon, Henry L. Taylor Professor, School of Kinesiology; Moira Petit, assistant professor, School of Kinesiology; Maureen Weiss, professor, School of Kinesiology.

Special Thanks

Appreciation is also extended to the following individuals, all of whom have made a significant contribution to the preparation of this report:

- Alan Aycock, professor (Department of Anthropology, University of Wisconsin—Madison);
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- Tucker Center staff: Erin Becker, program associate; Heather Maxwell, former research assistant; Chelsey Rodd, research assistant; and Jonathan Sweet, program associate.

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Finally we would like to extend a special thank you. This report in particular and the work of the Tucker Center in general would not be possible without the ongoing support, commitment, and generosity of Dr. Dorothy McNeill Tucker.

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Letter from the Project Directors

IN 1997, THE TUCKER CENTER FOR RESEARCH ON GIRLS & WOMEN IN SPORT at the University of Minnesota, in collaboration with the President’s Council on Physical Fitness and Sports, produced the groundbreaking report *Physical Activity & Sport in the Lives of Girls: Physical & Mental Health Dimensions from an Interdisciplinary Approach*. The purpose of the report was to highlight the multiplicity of ways in which physical activity and sports have become essential in the lives of girls. Employing an interdisciplinary research perspective, the report examined the physical, psychological, social, and cultural benefits girls derive from participation in sport and physical activity, the barriers that prevent them from reaching their full potential, and the kinds of environments in which girls learn how to develop and foster the best parts of themselves both on and off the playing fields. In short, the report took a comprehensive approach to understanding how sport and physical activity impact the “complete girl,” as well as her family and community. As part of this effort, we learned that girls’ involvement went far beyond athletic competition—it was also about how their participation helped them become a public health asset, and provided an educational opportunity and developmental aid. Here are some of the key findings from the original report:

- Regular physical activity can reduce girls’ risk of many of the chronic diseases of adulthood such as coronary heart disease, diabetes, and colon cancer;
- Athletic girls perform better academically and have lower dropout rates than do their non-athletic counterparts;
- Poverty substantially limits many girls’ access to physical activity and sport, especially girls of color who are overrepresented in lower socioeconomic groups;
- Regular physical activity reduces the impact of stress and depression and improves self-esteem in young girls; and
- Girls participate not only for competitive reasons, but to get in shape, socialize with their peers, develop physical skills, and have fun.

What these examples make abundantly clear is that fostering a healthy lifestyle through one’s involvement in sport and physical activity significantly improves quality of life, and also helps to prevent disease and mental illness. What the initial report also revealed is that adolescence is a critical time to lay the foundation for involvement in lifelong physical activity, but that unfortunately, young girls are only half as likely to be engaged as are young boys. One reason for this latter finding is that gender inequities, stereotypes, and barriers continue to limit the experiences and outcomes that sport and physical activity afford girls.

A key question we asked in the original report—and one that is central to our current endeavor—is, how can we create environments that enable girls to reach their full potential through sport and physical activity? One answer can be found in the comments of former Secretary of Health and Human Services, and current President of the University of Miami, Donna Shalala:

We need to ... develop a national commitment to ensure that every girl receives the encouragement, training, and support she needs to develop and maintain an active lifestyle. Increasing physical activity among girls is a formidable public health challenge, but the potential rewards are great.

One way to develop a national commitment ensuring that every girl has ample opportunity to fully engage in sport and physical activity is to use research as a pathway to knowledge. This pathway will, in turn, encourage teachers, parents, scholars, administrators, and community leaders to create and promote opportunities for young girls to be more physically active throughout their lives. The purpose of the initial report, as well as our 10-year update, was to ask the very best scholars in their respective fields, from the social to the natural sciences, to create and illuminate that pathway.

SCOPE AND IMPACT OF THE INITIAL REPORT

Since the initial report was published a decade ago, the Tucker Center has distributed over 10,000 full reports and 15,000 executive summaries worldwide. Organizations in the United States, from the Carnegie Corporation of New York to Sports4Kids in Oakland, California, and to those across the globe such as the Women's Sports Foundation in Western Australia, have requested copies of the report. Faculty, students, and staff members at institutions of higher education not only used the initial report as part of their own personal libraries, but numerous educators have required it as a text in their classes. In addition to serving educational purposes, the initial report:

- Functioned as a catalyst for interdisciplinary thought and research designs;
- Stimulated innovative research projects that examined how the intersections of race, ethnicity, and socioeconomic status affect girls' involvement in physical activity contexts; and
- Provided a resource that galvanized a commitment to ensure that all girls receive support in developing and maintaining a healthy, active lifestyle.

Given the scope and impact of the initial report, interest in an updated version has been steadily increasing. With the 10th anniversary of the original report upon us, we recognized

the need to produce a follow-up report which we have now accomplished with our current project—*The 2007 Tucker Center Research Report, Developing Physically Active Girls: An Evidence-based Multidisciplinary Approach*.

The last decade has given rise to a significant and growing body of empirical and advocacy work regarding the influence of physical activity and sport in the lives of all females. For example, the National Association for Girls and Women in Sport (NAGWS), with the support of the American Alliance of Health, Physical Education, Recreation and Dance (AAHPERD), recently published a volume titled *Ensuring the Health of Active and Athletic Girls and Women* (Ransdell & Petlichkoff, 2005); this work includes research on the correlates (e.g., physical activity self-efficacy) and outcomes (e.g., reduced risk for heart disease) of participation in sport and physical activity for females across the lifespan. Similarly, the Women's Sport Foundation (WSF) has produced a number of position papers and reports on critical issues impacting girls and women as a result of their involvement in physical activity. One recent example is their 2004 report, *Her Life Depends on It: Sport, Physical Activity and the Health and Well-Being of American Girls* (Sabo, Miller, Melnick, & Heywood, 2004), which details how girls' participation can serve as a preventative tool for counteracting heart disease, substance use, teen pregnancy, and obesity.

The contributions from such organizations as NAGWS and WSF further our understanding of the importance of sport and physical activity—as disease prevention or benefits across the lifespan—in the lives of all females. However, what is also needed is a singular focus on “the complete girl”—her physical, social, cultural, and emotional environment rather than just one aspect of her physical activity or sport experience. *The 2007 Tucker Center Research Report* provides such a focus that is grounded in a unique multidisciplinary approach.

THE 2007 TUCKER CENTER RESEARCH REPORT—A 10-YEAR UPDATE

As mentioned above, we received overwhelmingly positive feedback about the first report. Not only did scholars, parents, practitioners, and young girls themselves find the original report to be an invaluable resource, they also appreciated its comprehensive format and structure, its continuity between chapters, and its detailed recommendations for future research. Our updated report maintains this comprehensive approach in that we focus on the psychological, sociological, and physiological dimensions—and impact—of physical activity in the lives of young girls. And similar to the initial report, each of the chapters in this updated version contains:

- A brief summary of key findings from the initial report;
- An overview of the most recent and compelling research; and
- A summary and implications of research findings.


One important addition to the current report is the inclusion of an innovative “best practices” chapter that provides in-depth, research-based information on how practitioners can create and implement a best practices sport or physical activity program for girls. As many of us know, research that is generated by sport scholars is far too often viewed by practitioners in the field as having little or no practical application to their everyday lives. To avoid this situation, we felt it was important to provide a road map for practitioners—from the coach of an AAU girls’ basketball team to a community parks and recreation director—that would translate the research findings contained within the current project into concrete, practical suggestions. In sum, the goal of this final chapter is to bridge the gap between theory and practice. Laying out a road map for doing so increases the likelihood of maximizing positive benefits for girls such as increasing academic performance, while minimizing such negative consequences as depression and anxiety which often result from the pressures of competition.

The Best Practices chapter will conclude with a series of policy recommendations and directions for future research derived from governmental and professional organizations, as well as from the previous chapters associated with the psychological, sociological, and physiological dimensions of girls’ physical activity. These specific recommendations and suggestions for future research provide an ideal context for ensuring the optimal health and positive development of young girls through their involvement in sport and physical activity.

It is our hope that *The 2007 Tucker Center Research Report*, like the original report, will serve as an inspiration and catalyst for change. We believe that by working together, parents, coaches, educators, policy makers, and community leaders can provide opportunities for diverse populations of girls to initiate and sustain physical activity throughout their lives. In short, our current project embodies the intent and commitment of the original President’s Council Report as expressed a decade ago:

Our hope is that those most able to effect change will use this information as a vehicle for pursuing future areas of research and developing and implementing programs that will make a difference in one of this country’s most important assets—girls.

That hope—and commitment—are the cornerstones of *The 2007 Tucker Center Research Report*.



Mary Jo Kane
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University of Minnesota

CHAPTER I

Physical Activity Behavior: What Girls Do

NICOLE M. LAVOI, PH.D., AND DIANE M. WIESE-BJORNSTAL, PH.D.,
UNIVERSITY OF MINNESOTA

IN THIS INTRODUCTORY CHAPTER WE BEGIN WITH AN OVERVIEW OF what is known about the trends and participation patterns of girls' physical activity—in short, what girls do. In the original 1997 President's Council on Physical Fitness and Sports Report, sport scholar Don Sabo pointed out that sport and physical activity are not simply an isolated set of behaviors that girls do in a vacuum. On the contrary, involvement in physical activity is part of a larger “interdependent set of physiological, psychological, and social processes that can influence and, in varying degrees, sustain girls' growth and development” (Center for Girls & Women in Sport, 1997, p. xxi). This is precisely why the current report, like the original, uses an interdisciplinary approach to make more visible the complex connections between physical activity and the psychosocial and physiological consequences of that activity in the lives of girls.

To set the stage for this analysis, we must first identify “what girls do”—or in some cases “don't do”—regarding their involvement in sport and physical activity. We know, for example, that adolescent girls participate in a broader array of physical activities, ranging from informal, play-like environments to the pressure-cooker world of Olympic sports, than ever before in our history. We also know that the historical barriers that have prevented girls from engaging in sport and physical activity in the first place—barriers such as stereotypes about girls' inherent physical capacities and inequities in funding priorities—continue to limit girls' ability to reach their full potential. By presenting an overview of current trends and practices surrounding young girls' involvement in sport and physical activity, this chapter provides a context to more fully understand the psychological, sociological, and physiological dimensions of physical activity detailed in subsequent chapters within this report.

The Physical Activity Trends of Girls

Girls participate across wide continuums of physical activity opportunities ranging from unstructured to structured, solitary to groups and teams, child-organized to adult-organized, and meeting exercise and recreational to elite sport competitive goals. The extremes of

Adolescent girls participate in a broader array of physical activities, ranging from informal, play-like environments to the pressure-cooker world of Olympic sports, than ever before in our history.

behavior range from sedentary under-activity to excessive over-activity, both of which can be detrimental to development, and physical and mental health. Our target for girls is an optimum, healthful balance in the frequency, intensity, and duration of their physical activity participation. It is well documented that girls' participation in sports and physical activity can serve as a vehicle for positive development. However, on the 35th anniversary of the passage of Title IX, three important trends in girls' participation patterns within physical activity are evident.

TREND ONE

First, the trend in organized sports reveals girls and women are participating in sports in record numbers at all levels—from youth to high school, up through college and professional sports. The specific focus of this report is girls 18 and under, which for most girls corresponds with participation in youth sports through high school sports. Girls 6 to 17 years of age account for approximately 44% (11.4 million) of sports team members, and another 20% (4.75 million) of girls participate in sport activities, outside of organized team competition (Sporting Goods Manufacturers' Association [SGMA], 2001). The National Federation of State High School Associations' (NFHS, 2007) *High School Athletics Participation Survey* shows that 53% of all American high-school students participate in interscholastic sports, including a growing number of girls. In 1996-97, 2.47 million girls participated in high school sports and in 2005-06 that number rose to 2.95 million (NFHS, 2007). Similar trends of increasing sports participation of girls are also reported in “extreme” sports (e.g., skateboarding) and by youth agency-sponsored leagues such as US Youth Soccer and USA Lacrosse (SGMA, 2007; US Youth Soccer, 2007). Despite the rise in participation for some sports, significant declines in team sports (e.g., gymnastics, volleyball, softball), pick-up play, and multi-sport participation are evident among youth (SGMA, 2007), amidst the changing interests of girls, pressures of early sport specialization, intensive training expectations at young ages, and selection or funneling processes that, among other things, eliminate lesser-skilled girls and often discourage their future participation in physical activity.

TREND TWO

The second important trend is that girls' participation in moderate-to-vigorous physical activity or MVPA (the level of activity needed to accrue and maintain health benefits) outside of organized sports is declining. According to the *Surgeon General's Report of Physical Activity and Health* (U.S. Department of Health & Human Services, 1996), nearly half of young people are not moderately or vigorously active—and this is especially true for girls! Based on the report *Promoting Better Health for Young People through Physical Activity and Sport* (Centers



for Disease Control and Prevention [CDC], 2000a), overall trends show a gradual decline in participation in MVPA among girls as they move from childhood through adolescence, and from grade 9 through grade 12. In addition, declines are greater in black girls than in white girls (Kimm, Glynn, Kriska, Barton, Kronsberg, Daniels, et al., 2002). One context where girls have opportunity to achieve vigorous or moderate activity is during physical education classes within schools. However, data shows approximately one-half (48%) of all high school girls are enrolled in physical education, and girls' enrollment in physical education declines from grade 9 (70%) to concerning levels in grade 12, where only 32% of girls are enrolled in physical education (CDC, 2005). But even though some girls attend physical education, only 29% of all girls attend physical education daily, a number that also declines from 9th (43%) to 12th grade (19%) (CDC, 2005). Girls' activity intensity also declines from 9th to 12th grade (CDC, 2005). So while 1 in 3 girls are active through sports participation—a number that has increased since 1972 from 1 in 27 (NFHS, 2007)—one third of girls barely meet minimal physical activity standards, and the remaining third are completely sedentary (Women's Sport Foundation Report, 2007).

TREND THREE

The third and related trend reveals that girls' participation rates and behaviors in all types of physical activity—from organized sports, to outdoor recreation, to youth clubs, to physical education—consistently lag behind those of boys. According to the 2005-2006 NFHS *High School Athletics Participation Survey*, 2.95 million girls and 4.21 million boys participated in high school sports—meaning the ratio of female to male participation in interscholastic sports is approximately 3:5 (NFHS, 2007). In general, boys (61%) are much more likely to participate on sports teams than are girls (53%) (Theokas & Bloch, 2006). Similarly, girls join organized sports at later ages than boys (CDC, 2000a), girls are less likely to have played on one or more sports teams than boys (50% and 62% respectively) (CDC, 2005), and a greater number of girls (54%) are not active in organized sports, compared with boys (41%) (SGMA, 2001). In addition, girls have lower rates of enrollment in sports clubs (Vilhjalmsson & Kristjansdottir, 2003), and are less likely to be involved in outdoor sports and activities such as snowboarding, surfing, trail running, hiking, and rock climbing (SGMA, 2004). While girls' participation rates are consistently lower than boys, the dropout rate reveals an opposite tendency. Sport attrition rates peak at 14 to 15 years of age (Carnegie Corporation of New York, 1996), girls are twice as likely to drop out of sports as are boys (United States Surgeon General, 1996), and girls drop out at younger ages (CDC, 2000a).

While daily physical education is declining for all high school students, males are more likely to enroll in physical education than are females, and male students in 11th and

So while 1 in 3 girls are active through sports participation—a number that has increased since 1972 from 1 in 27—one third of girls barely meet minimal physical activity standards, and the remaining third are completely sedentary.

12th grades are twice as likely as their female counterparts to attend physical education class daily (CDC, 2003). When girls do enroll in physical education classes, they are less active than boys (McKenzie, Prochaska, Sallis, & LaMaster, 2004). Girls are less likely to participate in vigorous physical activity (57%) or on sport teams (49%) than boys (72% and 62%, respectively). Already by elementary school age and continuing through adolescence, girls are less physically active than boys (Craig, Goldberg, & Dietz, 1996; Garcia, Pender, Antonakos, & Ronis, 1998; Posner & Vandell, 1999; Trost et al., 1996; Vilhjalmsson & Thorlindsson, 1998). Less physical activity participation has negative consequences, such as excess weight gain as documented among 9- to 12-year-old girls reporting low participation in sports outside school (O’Loughlin, Gray-Donald, Paradis, & Meshefedjian, 2000), and increases a multitude of other co-morbid factors detailed within the chapters of this report.

Summary

Why do gendered trends and gaps in physical activity behaviors persist precisely at a time when girls have the most to gain developmentally? The authors in this report take up this important question from their respective academic disciplines from the natural sciences to the social sciences. In addition, they document the positive—as well as the negative—outcomes and experiences that can result from girls’ participation (or a lack thereof) in physical activity. In Chapter 2, Diane Wiese-Bjornstal, from a sport psychology perspective, specifies how the psychosocial climates of physical activity affect the experiences of individual girls, and how the psychology of individual girls influences their physical activity experiences. She suggests that the thoughts, feelings, and actions of girls in physical activity settings are largely dependent on the influences of coaches, physical education teachers, and exercise leaders. In Chapter 3, sport sociologist Margaret Duncan outlines how sociological dimensions such as gender, race, ethnicity, and social class can have a direct impact on the ways in which girls engage in sport and physical activity. For example, she argues that by severing the link between femininity and inactivity girls are given agency over their own bodies, and are subsequently more likely to participate in physical activity. In Chapter 4, exercise physiologists Barbara Ainsworth, Jeanne Nichols, and Kelley Pettee provide an overview of the physiological and metabolic correlates of the physical activity and sports participation of girls. They point out that childhood and early adolescence provide a window of opportunity for girls to maximize bone mineralization which reduces likelihood of osteoporosis in adulthood. In Chapter 5, Wiese-Bjornstal and Nicole LaVoi integrate knowledge and recommendations from Chapters 1 through 4 and provide a road map for practitioners to help them create and implement “best practices” sport or physical activity opportunities for girls. By including a best practices component we hope to increase

Sport attrition rates peak at 14 to 15 years of age, girls are twice as likely to drop out of sports as are boys, and girls drop out at younger ages.



the likelihood that girls will achieve, using the words of girls—“normal healthy” (i.e., feel accepted and possess the ability to maintain healthy diet and exercise patterns) (Schoenbery, Salmond, & Fleshman, 2006)—and continue to be physically active into adulthood!

In summary, are girls physically active? The answer is an emphatic—YES! But are girls as active as they could be, or are they as active as boys? The answer is an emphatic—NO! Why might these gaps in physical activity behaviors exist? In short, research suggests it is likely due to the fact that girls typically report more barriers to physical activity participation than do boys. These include:

- *time-based barriers* (e.g., too much homework, responsibilities to care for younger siblings, chores, parental expectations for girls to be at home) (e.g., Posner & Vandell, 1999; Trost et al., 1996),
- *access and opportunity barriers* (e.g., limitations in transportation, facilities, equipment, lack of culturally relevant activities, language, and finances) (e.g., Crespo, 2005; Dunton, Jamner, & Cooper, 2003; Posner & Vandell, 1999; Weiler, 1998),
- *interpersonal barriers* (e.g., low caregiver motivation to support girls’ physical activity engagement, presence of co-morbid factors associated with inactivity, parental belief that sport is not as important for girls as for boys) (e.g., Gordon-Larsen et al., 2004), and,
- *psychological barriers* (e.g., limited confidence in their physical abilities or knowledge about physical activity and sport, low perceived behavioral control, low physical self-efficacy) (e.g., Dishman et al., 2004; Martin et al., 2005; Motl, Dishman et al., 2005; Varpalotai & Doherty, 2000).

In order for girls to begin, maintain, and then better adhere to physical activity participation, communities, professionals, and parents must work together toward reducing the barriers that stand in their way. The research-based knowledge in the following chapters provides a more in-depth treatment of the social, cognitive, emotional, behavioral, cultural, and physiological evidence that can minimize, or contribute to, the gendered physical activity participation gap that shapes the physical activity behaviors of girls.

For girls to begin, maintain, and then better adhere to physical activity participation, communities, professionals, and parents must work together toward reducing the barriers that stand in their way.

Psychological Dimensions of Girls' Physical Activity Participation

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THIS CHAPTER ON PSYCHOLOGICAL DIMENSIONS IS BASED ON RESEARCH on girls' physical activity within the last 10 years and updates the 1997 President's Council on Physical Fitness and Sports Report, *Physical Activity & Sport in the Lives of Girls: Physical & Mental Health Dimensions from an Interdisciplinary Approach*. The original report called for much needed research specific to dimensions of physical activity for girls and detailed what was known about motivation, self-perceptions, moral development, emotional well-being, stress and anxiety, body image, and disordered eating. In the 10 years following the original report, a considerable amount of research has been conducted that advances psychological understanding of girls' participation in physical activity. In short, psychology research verifies the following important facts about girls and physical activity:

- Girls love physical activity experiences and through them develop important relationships.
- Girls enjoy the challenges of sport and gain confidence through being physically active.
- Girls like the camaraderie and fun inherent in sport, but they rely on adult physical activity leaders to create high quality, positive experiences.
- Girls suffer negative psychological consequences if those leaders do not use their power wisely to meet girls' developmental needs.

Sport psychology research examines the thoughts, feelings, and actions of people in physical activity contexts. It considers how sport and the person reciprocally influence each other through social, cognitive, affective, and behavioral mechanisms. In the present chapter we look at how the social climates of physical activity experiences affect individual girls, and how the psychology of individual girls influences their physical activity experiences. Increasing the quantity and quality of physical activity is a goal in and of itself for the promotion of physical and mental health, but physical activity is also an important medium through which positive psychological development can be promoted.

Girls like the camaraderie and fun inherent in sport, but they rely on adult physical activity leaders to create high quality, positive experiences.

This chapter details how social, cognitive, and affective factors enhance or detract from girls' physical activity behaviors that were outlined in Chapter 1.

Physical Activity Social Climate: People Who Influence Girls

The social climates surrounding physical activity as established by parents, coaches, teachers, and peers affect girls psychologically as well as physically (Saunders, Motl, Dowda, Dishman, & Pate, 2004). Climates are changeable, and with an understanding of how climates influence individual girls they can be structured and controlled in ways that maximize the positive outcomes and minimize the negative outcomes.

PARENTS AND FAMILY CLIMATE

By virtue of the beliefs that they hold, parents offer differing opportunities to their daughters. Parents are the ones who typically make the choice to enter their child into sport and physical activity opportunities. If physical activity is not seen as valuable—or if parents do not believe their daughters to be competent at physical activity—parents are less likely to offer physical activity participation opportunities to them. A developmental continuum of organized sport involvement often looks like the following scenario (Côté, 1999; Wylleman & Lavallee, 2004). The sampling years (3 to 6 years of age) are those in which parents enroll their children in a variety of sports programs; in the specializing years (7 to 12 years of age) parents become more committed supporters of their child's involvement in a limited number of sports. During the investment years (13 to 18 years of age) the demands and expectations on children and parents increase, and an optimal and productive performance environment is expected. Why do parents enroll their children in these sport programs? Parents have multiple reasons for wanting their daughters to be involved in sport programs, including such motives as physical and social development, learning life skills, achievement and rewards, and family bonding (Bzdell, 2001). In spite of wanting their girls to be physically active, it is also the case that from early ages parents allow girls to take fewer physical risks in their active play than boys, thus perhaps instilling in girls a conflicting belief that they are more vulnerable to injury than are boys (Wiese-Bjornstal, 2001).

Aside from their role in tangibly supporting their daughter's involvement in organized sport, parents influence how girls view their own physical abilities. Children are very aware of how their parents appraise their physical abilities (Bois, Sarrazin, Brustad, Chanal, & Trouilloud, 2005), and girls' perceptions of parent appraisals predict belief in their own abilities (Fredricks & Eccles, 2005) as well as their actual participation in physical activity. Girls' perceptions of their sport competence change over time, with one study showing an overall decline in these perceptions from first through twelfth grade (Fredricks &

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Eccles, 2002). Fathers in this study were found to hold more influence over their daughter's sport competence and value beliefs than mothers; these authors also noted that fathers typically invested more time in their child's athletic participation. But the types of influence wielded by fathers affect consequences for their daughters. For example, female soccer players who perceived their fathers to be involved but exerting lower amounts of pressure reported greater enjoyment and motivation for their soccer participation than girls who perceived higher pressure and involvement from their fathers (Babkes & Weiss, 1999).

Other research suggests that mothers are more often the parent most closely associated with a child's sport participation (e.g., Green & Chalip, 1997; Weiss & Hayashi, 1995; Wolfenden & Holt, 2005) and are typically the ones to first enroll their daughters in sport programs (Davison, Cutting, & Birch, 2003). Perhaps the involvement of fathers takes a more stereotypically direct and active role (e.g., as coach) while the involvement of mothers more often takes the equally stereotypic supportive role (e.g., for provision of transportation, uniforms and apparel, snacks). Data from Fredricks and Eccles (2005) indicated that whereas over 27% of fathers coached their child's sport team, the percentage of coaching mothers was less than 4%. Davison et al. (2003) found that mothers reported engaging in significantly more logistic support whereas fathers reported engaging in significantly more explicit modeling through their own physical activity engagement. Mothers and fathers who are perceived as active role models affect positive psychological outcomes for their daughters (Babkes & Weiss, 1999; Davison et al., 2003; Ransdell, Dratt, Kennedy, O'Neill, & DeVoe, 2001), and yet girls often report on the limited number of active female role models in their lives (Ehlinger & Katz, 1995; Garcia et al., 1998). It would be productive for girls' participation and satisfaction if both mothers and fathers would share the varied joys, opportunities, and responsibilities of valuing and supporting their daughters in physical activity settings through both the active and supportive roles.

Family support for more general physical activity is important as well (Saunders et al., 2004). Among a national sample, Sallis, Prochaska, Taylor, Hill, and Geraci (1999) found that the most powerful predictors of physical activity participation among children in grades 4 to 12 were use of afternoon time for sports and physical activity, enjoyment of physical education, and family support for physical activity. In a study of inactive adolescent girls, one of the strongest predictors of increased physical activity was support from parents, peers, and teachers (Neumark-Sztainer, Story, Hannan, Tharp, & Rex, 2003). Parents who believe in the physical competence of their girls and enact those beliefs through supportive actions provide the groundwork upon which girls will be more likely to value and feel good about physical activity participation throughout their developmental years (Brustad, 1996). Parental encouragement, direct support and facilitation, positive expectations, valuing physical

In a study of inactive adolescent girls, one of the strongest predictors of increased physical activity was support from parents, peers, and teachers.

activity and believing it important, fostering physical activity climates that focus on learning and enjoyment, and role modeling physical activity are all powerful means by which parents can facilitate the physical activity engagement of their daughters (Davison, Downs, & Birch, 2006; Fredricks & Eccles, 2004; Welk, 1999; White, 1996).

COACHES AND COMPETITIVE SPORT CLIMATE

The coach-athlete social relationship is central to girls' adherence to organized sport programs and their satisfaction with these experiences. The coach-athlete relationship and associated interactions progress through stages (Bloom, 1985; Wylleman & Lavallee, 2004). In the initiation stage (3 to 9 years of age), coaches typically reward athletes for effort extended rather than results. In the development stage (10 to 15 years of age) coaches become more involved, more personally invested, and more dominant in their role. They expect athletes to advance their sport performance and achievement through discipline and hard work. Athletes at this age, however, prefer that coaches accomplish this through allowing them greater participation in decision-making, and developing warm interpersonal relationships and a positive group atmosphere. In the mastery stage (16 to 18 years of age), a more equal partnership develops between coaches and athletes, and athletes typically become more responsible for their personal training and progress (Wylleman & Lavallee, 2004).

Ego-oriented climates ... lead to undesirable psychological outcomes such as greater anxiety, lower enjoyment and satisfaction, and more negative relationships with others in the sport environment.

The motivational climate within an organized sport team is most directly affected by the philosophies and practices of coaches. A consistent body of literature supports that coaches should create task-involving climates—climates that characteristically include a focus on mastering skills, reinforcement for effort and improvement, supportive peer relationships, and an inherent belief in the value and unique role of each individual athlete—because they are superior in producing desired psychological outcomes such as more enjoyment, greater satisfaction, intrinsically motivated behavior, positive relationships with others in the sport environment, and less anxiety (Galloway, 2003; Smith, Fry, Ethington, & Li, 2005). Female high school basketball players perceived a task-involved climate when their coaches used positive and encouraging feedback following both successful and unsuccessful performances, and when they did not ignore mistakes (Smith et al., 2005). Adolescent female soccer players (Allen & Howe, 1998; Wilco, 2004) and swimmers (Black & Weiss, 1992) accrued more positive psychological benefits when their coaches used praise and information after good performances, and encouragement and corrective information following errors. Adolescent volleyball players who adopted a higher task orientation and perceived a mastery climate in their training were more confident in their own abilities, more responsive to the coaches' expertise, and more open to other sources of information about their competence (Magyar & Feltz, 2003).



Ego-oriented climates—characterized by a focus on outperforming others, differential treatment of and favoritism toward high-ability team members, competitive peer relationships, and an inherent belief in the superiority of higher skilled athletes—lead to undesirable psychological outcomes such as greater anxiety, lower enjoyment and satisfaction, and more negative relationships with others in the sport environment (Smith et al., 2005). Female basketball players perceived an ego-involved climate as one in which their coaches gave less positive feedback and used more punishment feedback (Smith et al.). Hayashi (1998) found that female youth gymnasts who perceived their coaches as providing more punitive feedback were more likely to discontinue their participation.

Girls want coaches to provide good technical instruction and contingent positive feedback; allow them to participate in decision-making about goals, practices, and games; create positive team atmospheres; and develop warm interpersonal relationships with them (Mageau & Vallerand, 2003; Martin, Jackson, Richardson, & Weiller, 1999; Weiss, Ebbeck, & Horn, 1997). These characteristics of social relationships with coaches affect girls’ continued participation through increasing their satisfaction with, and confidence in, their sport experiences.

PHYSICAL EDUCATION TEACHERS AND SCHOOL CLIMATE

Adult physical activity leaders and school climates (Birnbaum et al., 2005) play influential roles in girls’ attitudes (Silverman, 2005) and behaviors (Trudeau & Shephard, 2005). Research in physical education classrooms shows that student perceptions about the motivational climate, and the reward structure of the classroom created by teachers, affect their physical activity beliefs and interests. Students that perceive the physical education classroom climate to be more task- and mastery-oriented—with emphasis on learning, effort, and improvement—are more likely to give their best effort and persist in the face of difficulty than when the climate is perceived to be ego-oriented. Indicators of an ego- or performance-oriented environment in the physical education classroom would include more emphasis on the use of social comparison, demonstration of personal superiority, and public displays of prowess. Physical education students in ego-oriented climates typically demonstrate more negative attitudes, greater focus on outcomes rather than process, and have lower confidence beliefs (Magyar & Feltz, 2003). Treasure (1997), for example, found that 10- to 12-year-old children who perceived a higher-performance/lower-mastery climate in physical education class believed ability (rather than effort) caused success, experienced boredom, and had a negative attitude toward physical education. Children who perceived a higher-mastery/moderate-performance climate in physical education class experienced satisfaction in physical education, held positive attitudes toward physical education, believed both ability and effort caused success, and had high levels of perceived ability. Likewise, children who perceive autonomy-supportive behaviors from

Girls want coaches to provide good technical instruction and contingent positive feedback, allow them to participate in decision-making, create positive team atmospheres, and develop warm interpersonal relationships with them.

physical education teachers and mastery-involved climates in their classes have been found to be more likely to engage in self-directed leisure activity outside of physical education class (Standage, Duda, & Ntoumanis, 2003).

The ways in which physical activity leaders give feedback about motor performances affect girls' psychological responses as well. Informational feedback provides skill-relevant information in response to a physical attempt, and can provide descriptive feedback, which "describes" what just happened, or prescriptive feedback, which "prescribes" how to fix an error or how to maintain good performance for the future. Evaluative feedback places a judgment of approval or disapproval on the performance (such as praise or criticism). How girls interpret these types of feedback and the consequences for their perceptions of competence and ability appears to be moderated by a variety of factors such as age and sport experience. In general, however, feedback affects girls' perceptions of physical ability, effort, and future expectations for success (Amorose & Smith, 2003). Evidence shows that physical activity leaders—including physical education teachers, coaches, and exercise instructors—best encourage girls' participation through the use of positive, contingent, supportive, informational feedback combined with low punitive feedback (Horn, 2002). These leaders can also detract from girls' participation with an overemphasis on ignoring (no feedback), negative, and punitive feedback (Horn, 2002). Thus the message for physical education teachers is to establish a task-focused and positive environment to generate longer-term commitment to physical activity among girls. Beyond this, characteristics of a physical education classroom climate related to increased physical activity among adolescent girls includes not only developing an enjoyable and motivating environment but also providing a broader range of physical activity offerings such as aerobics, self-defense, and weight training in addition to competitive sports and other traditional physical education activities (Pate et al., 2005).

Thus the message for physical education teachers is to establish a task-focused and positive environment to generate longer-term commitment to physical activity among girls.

PEERS AND SOCIAL CLIMATE

Among the most important social influences for girls is their peer group. Research on friendships and peer relationships in physical activity contexts provides us with substantial information that helps us understand girls' behaviors as friendships are related to self-perceptions, enjoyment, and motivated behavior in physical activity (Smith, 2003; Weiss & Stuntz, 2004). Dimensions of sport friendships include factors such as self-esteem enhancement and supportiveness, loyalty and intimacy, things in common, companionship and pleasant play, conflict resolution, and conflict (McDonough & Crocker, 2005; Weiss & Smith, 1999).



Qualities of friendships and other peer relationships vary with age, and, to a certain extent, with gender (Weiss & Smith, 2002). Weiss, Smith, and Theeboom (1996) found in interviews with children and youth about the positive and negative characteristics of their sport friendships that younger children (8 to 12 years of age) talked more about the importance of attractive physical qualities of their friends, prosocial behavior, and loyalty than did the older youth. Adolescents (13 to 16 years of age) more frequently mentioned the attractive personality attributes of their sport friends. Weiss and Smith (2002) found that children (10 to 13 years of age) cited companionship and pleasant play as more important sport friendship qualities than did adolescents (14 to 18 years of age), who rated loyalty and intimacy, things in common, and conflict more highly.

With respect to gender, in many ways boys and girls are similar in the qualities of their best sport friendships (Weiss & Smith, 2002). The only gender difference noted by Weiss et al. (1996) in their interviews was that girls, to a much greater extent than boys, cited emotional support as an important dimension of friendship quality. Weiss and Smith (2002), however, found that female junior tennis players (10 to 18 years of age) rated the qualities of self-esteem enhancement and supportiveness, loyalty and intimacy, and things in common as more characteristic of their sport friendships than did male players, who rated conflict as more typical in theirs.

Beyond dyadic interaction patterns with sport friends, the role of the broader sport peer group has consequences for girls' achievement motivation (Smith, 1999). Ntoumanis and Vazou (2005) identified five dimensions of the peer motivational climate in youth sport clustered around task-involving peer climates (with dimensions of improvement, relatedness support, effort) and ego-involving peer climates (with dimensions of intra-team competition/ability, intra-team conflict). The task-involving dimensions of the peer motivational climate positively influence girls' enjoyment, satisfaction, and competence beliefs (Vazou, Ntoumanis, & Duda, 2006). Allen (2003) reported on three social motivational orientations among female adolescents in physical activity: affiliation, social status, and social recognition. These orientations were all important to the girls, and were positively related to their interest in and enjoyment of sport. Adherence to sport and exercise teams and groups is in part a function of the social environment within those groups, and the cohesion of the group. Spink (1995), for example, found among female participants 16 to 22 years of age in a recreational ringette league that those who perceived higher social cohesiveness within their team showed greater intention of returning the next season. Feelings of cohesion and belongingness were very important to their retention.

In the process of learning physical activity skills, peers are very important. Peer-assisted learning involves peers helping each other to acquire knowledge or skills. Peers in this

Compared to boys, girls in dyadic situations such as peer-assisted learning are more sensitive to their partner and engage in more tutoring and cooperation.

sense serve as coping resources for each other during this learning process. In physical activity settings, girls are somewhat different than boys in their peer interactions during peer-assisted learning. Compared to boys, girls in dyadic situations such as peer-assisted learning are more sensitive to their partner and engage in more tutoring and cooperation (d'Arripe-Longueville, Gernigon, Huet, Winnykamen, & Cadopi, 2002). The results of their study (d'Arripe-Longueville et al.) involving peer-assisted learning of a swimming skill supported general developmental findings that “interactive mechanisms among boys are mainly centered on personal appropriation of knowledge, whereas those observed among girls focus more on transmitting and sharing knowledge” (p. 233). In other words, boys wanted to gather knowledge for themselves whereas girls shared their knowledge with others.

It is clear that peers and families are important sources of social support to children and youth for physically active lifestyles. Among children and youth 10 to 14 years of age, Duncan, Duncan, and Strycker (2005) found that social support was positively related to physical activity. The strongest finding was that young people who perceived greater support for physical activity from their friends were more active. Having parents, siblings, and friends watching their participation was another important source of support. Evidence that most children want their parents to watch them play was also found by Shields, Bredemeier, LaVoi, and Power (2005) in their study of youth in grades five through eight. Understanding the important role of peers in enhancing physical activity participation is essential to successful adherence efforts among girls.

SOCIAL INFLUENCES ON PHYSICAL EXPERTISE AND TALENT DEVELOPMENT

Coaches and other adults play a critical social role in influencing girls' efforts toward developing expertise in sport performance. In order to achieve elite levels of sport skill performance, some researchers have demonstrated that athletes must accumulate thousands of hours of “deliberate practice”—described as effortful practice usually guided by a coach with the goal of facilitating performance improvements (Ericsson, Krampe, & Tesche-Romer, 1993; French & McPherson, 2004)—over at least a 10-year period (Ericsson, 1996). It is characterized by increasing amounts of practice time invested as athletes move up to higher levels of competition and age (Côté, Ericsson, & Law, 2005). Although intense commitment and preparation is necessary to achieve world-class sport performance, researchers in this area also say that coaches should provide sufficient periods of mental and physical rest allowing time for mental and physical recuperation, tissue regeneration, and avoidance of injury (Baker, Côté, & Deakin, 2005).

Intrinsic motivation for improvement also is inherent in the development of expert levels of sport skill. Retrospective evidence (French & McPherson, 2004) demonstrates that early in their careers, many elite athletes spent more time outside of organized practice sessions



working on their individual motor skills than did their ultimately less-elite counterparts. A composite of research on sport practice (derived from reviews by scholars such as French & Thomas, 1987; Starkes, Deakin, Allard, Hodges, & Hays, 1996) would lead to a rough estimate of approximately 4 to 6 practice hours per week outside of organized practices spent by these future elite young athletes on their individual motor skills from about 8 to 12 years of age. Additive to the physical practice effects, these unstructured child-centered times are driven by intrinsic motivation and behavioral choice, and they allow opportunity for the development of creative play-making and decision-making skills required in so many sporting activities.

Recently, scholars studying talent development suggest that talent identification cannot be achieved by discrete measures such as coach-judged tryouts, but rather must be viewed through a lens that sees talent as a complex and dynamic system that changes as the athlete develops (Abbott, Button, Pepping, & Collins, 2005). Under this system, the emphasis is on sport leaders continuously assessing the changing learning potential of young sport participants rather than relying on time-isolated, genetically driven indicators of sport performance that are heavily influenced by physical maturity alone. Current systems of identifying sport talent early are limited by their emphases on isolated observations by adults, such as through sport tryouts, making cuts, and emphasizing coaching practices that invest more time with the “high talent” young athletes. The consequence is that many potentially talented girls are prematurely eliminated from organized sport. These authors (Abbott et al.) emphasize that youth sport talent identification strategies should focus on assessments of physical, motor, and psychological dispositions, and their capacity to develop across transitions in individual athletes. The powerful social influence exerted by the evaluations of coaches during such talent identification processes should be focused on maximizing opportunity for development and improvement.

Many elite athletes evidence a pattern of broad-based physical activity participation throughout their childhood years that lays a foundation for their later expertise, rather than intense and exclusive foci on sport specialization at early ages (Baker, Côté, & Deakin, 2005; Côté et al., 2005). Parents play an important role in providing these varied early opportunities for girls. This pattern, though, is somewhat dependent on the specific sport. The fact that success in sports such as gymnastics and figure skating requires intense early training and a career that peaks in puberty is a function not only of the demands of the sport and the physical and psychological capacities of girls at certain ages, but also of the social influence of governing boards, which choose to adopt rules and reward physical maneuvers that force girls to excel early before their bodies grow, specialize early, and accept and play with injuries (Hartman Nippert, 2005; Wiese-Bjornstal, 2001, 2004), and to follow the dictates of often authoritarian and overbearing coaches (Krane, Greenleaf, & Snow, 1997; Ryan, 1995; Whitney, 2005).

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Not all sport skill practice can and should be adult structured, even for the development of sport talent. There are varying patterns of development and windows of time and experience within which elite levels of sport skill can be achieved. Adults who establish rules and standards for elite sport talent development programs are encouraged to use that power in ways that advantage and benefit girls' physical, mental, and social development.

Physical Activity Cognitions: What Girls Think

Maturational processes oblige girls to operate in a continually changing personal psychological climate as they move from early childhood through adolescence. Major components of girls' personal psychological climate include their cognitions or thoughts (such as beliefs and self-perceptions) and emotions or affect (such as anxiety and enjoyment). These interrelated and dynamic mechanisms become points at which practitioners can invest intervention efforts that can influence positive changes in the physical activity habits and experiences of girls. We first consider the cognitions that girls have about physical activity.

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VALUES, INTEREST, AND IMPORTANCE OF PHYSICAL ACTIVITY

What girls think and believe about the value of physical activity and how much interest it holds for them affects their feelings and actions. Social cognitive theory (Bandura, 1986) and the large body of literature exploring its premises in the physical activity environment supports that beliefs about self and environment influence affect and behavior. Research indicates that girls are interested in sports and physical activity, but see them as less important than do boys. Elementary school girls report less interest in and believe sports to be less important and useful than do boys of the same age, but compared to other domains of interest (including math, reading, and music), girls rate their interest highest in sports (Wigfield et al., 1997). The interest and importance that children place on sport influences current and future activity choices, such as participating in sport or exercise (Fredricks & Eccles, 2004). Adolescents who place higher value on sport and health improvement are more physically active (Vilhjalmsson & Thorlindsson, 1998), but the question remains as to whether they learn to value these domains more highly because they participate, or whether they participate because they value them more highly.

A community survey in Canada found that girls, more so than boys, were interested in initiating or increasing their physical activity participation in a variety of sports (Varpalotai & Doherty, 2000). Girls in their community, however, had fewer sports program opportunities than boys. Certain aspects of sport participation such as social, fitness, and group dynamics were particularly valued by the girls (Varpalotai & Doherty), but their opportunities to meet these motives were limited by the lack of available programs. Expanded community opportunities



for physical activity programming would be welcomed by the girls in this sample. One wonders how many other such inequities exist based on unchallenged misconceptions about what girls are interested in and what they value and seek in physical activity opportunities.

Ratings of sport importance become somewhat lower as girls move into adolescence, although their interest in sport remains high (Fredricks & Eccles, 2002). Garcia et al. (1998) found that the transition from elementary to junior high school was a time at which girls' physical activity beliefs changed. They found that following this transition girls reported less support for physical activity, lower exposure to physically active role models, and perceptions that the benefits of physical activity did not outweigh the barriers. Since perceived importance of a particular domain such as physical activity is a stronger predictor of participation than interest (Fredricks & Eccles, 2002, 2005) it is essential that girls perceive physical activity as important in their lives.

MOTIVATION

Participation motivation refers to why people are motivated to engage in particular activities, in this case sport and physical activity. Weiss and Ferrar-Caja (2002) report on three consistent reasons why youth participate in sport: 1) physical competence or adequacy, 2) social acceptance and approval, and 3) enjoyment. Consistent reasons for stopping are the converse of these: not developing or demonstrating competence, not feeling socially accepted, not enjoying the experience or having fun, as well as being harmed (e.g., injury, hurt esteem, hurt feelings) (Weiss, 2000; Weiss & Ferrar-Caja, 2002).

Competence motivation (Harter, 1987) refers to the degree to which individuals are motivated from within to master challenging skills and demonstrate competence. In the physical domain, children inherently want to move, to be active and playful, to be challenged, and to master physical tasks. Unfortunately, factors in the physical activity social environment can cause them to lose this innate intrinsic motivation, and they instead adopt an extrinsic (outward) motivational focus guided by preference for easy skills, rewards, and a dependence on teacher or coach approval for performing skills (Weiss & Williams, 2004).

Children's motivation for physical activity is affected by their perceptions of their own ability in relation to the difficulty of the physical task (Weiss & Williams, 2004). If they believe the tasks to be too hard for their perceived abilities, they will be somewhat less likely to perform them. According to Weiss and Williams, preschool-aged children use egocentric and self-referenced assessments of task difficulty, judging whether a task is hard or not by whether or not it is hard for them personally. They equate high effort with high ability in these preschool years (Fry & Duda, 1997). In the early elementary years, children begin to adopt a more objective level or norm-referenced view of task difficulty, such that

It is essential that girls perceive physical activity as important in their lives.

they recognize tasks that a few children can do are difficult, and that it takes high ability to complete those tasks. They are beginning to distinguish between ability and effort, but cannot separate them completely. In the later elementary and early middle school years, children begin to believe that performance on tasks can be improved with effort, but they believe that effort is the cause of ability. From about early adolescence on, children typically understand that the effects of effort on performance are limited by one's finite abilities, which indicates their ability to cognitively differentiate between ability and effort. Effort and ability are viewed as negatively related, meaning that if one has to work harder at something one must not have high ability (e.g., Fry & Duda, 1997; Weiss & Williams, 2004). These beliefs affect girls' perceptions of their own competence and potential for future success, and thus affect their motivated behavior in physical activity contexts.

Achievement motivation approaches focus on competence beliefs and subjective task values as predictive of motivated behaviors in achievement situations like sport. Competence beliefs refer to girls' perceptions of how good they are at physical activity and their expectations for future success. Subjective task values refer to the importance that girls place on physical activity participation. This approach to understanding motivation focuses on two orientations: task-involved, in which perceptions of competence are self-referenced with respect to performance and exerted effort (i.e., participants feel competent and successful when they have tried their best and have experienced personal performance improvement and/or task mastery), and ego-involved, in which perceptions of competence are dependent on comparisons with performance and exerted effort of relevant others (i.e., participants feel competent and successful when superior ability is revealed and they have shown more ability than others). Harwood, Hardy and Swain (2000) have suggested that within the ego-involved orientation a distinction should be made between perceptions of competence which are either dependent on demonstrating one's current ability, performance, and effort without comparisons to others ("self-referenced" ego involvement) or on demonstrating one's current ability, performance, and effort to be superior to that of others ("norm-referenced" ego involvement).

A large body of literature investigating goal perspectives and physical activity shows a task-involved perspective to be more strongly linked with positive beliefs and behaviors than an ego-involved perspective. Girls are more task-involved than boys, although some cultural differences have been observed (Guinn, Vincent, Semper, & Jorgensen, 2000). Many girls may be more interested in developing their personal capacities through sport than they are in establishing personal superiority over others (Ryckman & Hamel, 1995).

In terms of physical activity behaviors, looking at the physical activity motivational profiles of 12- to 15-year-olds, Wang and Biddle (2001) found that girls were disproportionately represented in the motivational clusters of "poorly motivated"

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and “amotivated” (i.e., a complete lack of motivation). Both of the motivational clusters were characterized by low levels of physical activity participation, self-worth, perceived competence, task orientation, and ego orientation. This verifies that something is missing in our efforts to help girls maintain continued motivation for physical activity participation.

GLOBAL SELF-ESTEEM

Self-esteem is the evaluative component of believing in, feeling good about, and valuing oneself. Girls’ self-esteem influences—and is influenced by—physical activity participation. A study of Mexican American adolescents, for example, found that higher self-esteem was associated with more physical activity involvement (Guinn et al., 2000). Adolescent females participating on sport teams had higher self-esteem than non-participant females (Keane, 2004). Achievement in team sports in early adolescence was associated with increased self-esteem in middle adolescence (Pedersen & Seidman, 2004), and participation by 10- to 12-year-old girls in a four-week sports camp resulted in improvements in their self-esteem (Hoganbruen, 1999). Among a diverse sample of Girl Scouts, nearly one-half reported that participating in an athletic activity made them feel good about, or esteem, themselves (Erkut, Fields, Sing, & Marx, 1996).

High self-esteem is associated with desirable psychological outcomes (such as low anxiety, generalized optimism, and happiness), but it should not come at the expense of esteem for others. Generalized self-esteem may be less important to physical activity participation, however, than more specific components of self-perceptions such as those girls hold about their physical competence.

PHYSICAL COMPETENCE SELF-PERCEPTIONS

The perceptions that girls hold about their physical competence affect their physical activity behavior. In general, younger children are more optimistic and older children are more realistic in evaluations of their competence (Wigfield et al., 1997), with an overall trend indicating children’s belief in their physical competence declines over time (Fredricks & Eccles, 2002). From early childhood, girls perceive themselves to be less competent in sports than do boys (Wigfield et al., 1997), although it may be that girls are more realistic about their competencies and boys overestimate their physical competence, especially in the early years. The global gender gap in physical competence beliefs and the value/importance placed on sport remains relatively constant from childhood to adolescence (Fredricks & Eccles, 2002). Adolescent female athletes in competitive sport, however, share with male athletes similar levels of competence perceptions, interest in sport, and valuing of sport as important and useful (Cox & Whaley, 2004).

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Girls rely on a variety of sources to gather information about their physical competence. These sources change with age and as a function of certain psychological factors (for reviews, see Horn, 2004; Weiss & Amorose, 2005; Weiss & Williams, 2004). Preschool and early elementary aged children rely to a greater extent than do older youth upon parent and spectator feedback and game outcome as information sources for knowing how good they are at physical activities. During late elementary and early adolescent ages, children demonstrate greater reliance on peer comparison and evaluation from peers and coaches. Later adolescence finds greater dependence on self-referenced information about physical competence (e.g., effort exerted, goal achievement, skill improvement) and on a wider variety of information sources than at earlier ages. Halliburton and Weiss (2002), for example, found that among adolescent (12 to 14 years of age) female gymnasts, reliance on physical competence information sources varied as a function of skill level. Lower-level gymnasts relied more on perceptions of effort and enjoyment as sources of information, whereas higher-level gymnasts relied on feelings of nervousness and spectator feedback. Social comparison processes are also in operation affecting girls' self-concepts in physical settings (Chanel, Marsh, Sarrazin, & Bois, 2005). In adolescence, girls may use different sources than boys for competence judgments, with girls more focused on using attraction toward physical activity, goal achievement, and adult and peer feedback and evaluation as bases for their judgments (Weiss, 2000).

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Weiss et al. (1997) reported that psychological factors also affect use of physical competence information sources. In their study, children with high anxiety and low competence self-perceptions were more reliant on external sources for physical competence information than were children with the opposite profile. The consequence was that the high anxious/low competence self-perception children were more psychologically vulnerable to coach and parent criticism. In other words, children who did not think they were very good at physical activity and who were anxious as a result of that belief relied more on what adults told them about their physical abilities. If adult comments reinforced their belief that they were not very good then they were more likely to believe it and thus be poorly motivated for future physical activity.

Physical self-perceptions and the associated self-confidence can be changed through experience. A physical activity program for 5- to 12-year-olds resulted in improvements in physical fitness and overcoming exercise barrier self-efficacy among girls (Annesi, Westcott, Faigenbaum, & Unruh, 2005), and a 12-week physical activity program for 11- to 14-year-old urban minority girls led to improvements in physical fitness and self-perceptions that included athletic competence and social acceptance (Colchico, Zybert, & Basch, 2000). Physical activity programs should identify strategies that enhance girls' physical self-perceptions and consequently encourage their participation.



PHYSICAL APPEARANCE SELF-PERCEPTIONS

How girls view and experience their bodies is central to understanding their physical activity behaviors. Body image can be appearance and/or performance focused. Girls, unlike boys, typically associate body image dissatisfaction with self-esteem (Furnham, Badmin, & Sneade, 2002), and low body image has been linked with risk behaviors in girls (Wild, Flisher, Bhana, & Lombard, 2004). Girls as young as age five who participate in aesthetic sports (e.g., gymnastics, dance) show more concern about their weight (reflective of appearance-related concerns) than girls in no sports or non-aesthetic sports (Davison, Earnest, & Birch, 2002). This may be a function of the culture and sport-specific expectations (see Sociological Dimensions chapter), as other research has found that aesthetic sport girls' body images do not differ from controls at the outset of their participation (Poudevigne et al., 2003). For developing girls, early maturation relative to peers can relate to lower physical self-worth for girls (Smith, 2004). Perceived and ideal body size discrepancies predict weight management motives for exercise participation among adolescent girls (Ingledeu & Sullivan, 2002), and in general weight and appearance concerns are primary motivators for physical activity participation among adolescent girls (McConnell, 1998; Strelan, Mehaffey, & Tiggemann, 2003).

Girls' thoughts about their bodies have emotional consequences. For example, social physique anxiety refers to feeling anxious about the evaluations others hold about one's body. High social physique anxiety causes girls to feel more anxious about how their bodies look, and relates to lower self-perceptions, disordered eating attitudes, and motives for exercise that focus on participating for appearance reasons and to look better to others (Eklund, Mack, & Hart, 1996; Smith, 2004). For these girls, exercise participation becomes a tool for impression management rather than something of inherent or intrinsic value for their mental and physical health, and as such anxiety and eating restrictions can make it difficult to limit excessive exercise even when contraindicated by health status (e.g., such as among adolescents with eating disorders) (Holtkamp, Hebebrand, & Herpertz-Dahlmann, 2004). Social physique anxiety tends to be higher in adolescent girls than boys (Eklund et al., 1996), and is in part related to the standards that the media conveys for the ideal female physique. One study of girls 9 to 16 years of age showed that 46% of girls made some attempt to look like female media figures, and higher physical activity levels were associated with the desire to look like these media figures (Taveras et al., 2004). Some researchers have found, however, that less body satisfaction in adolescents is related to lower levels of physical activity participation (Neumark-Sztainer, Goeden, Story, & Wall, 2004) and to disturbed eating (Strelan et al., 2003). The goal is to help girls have realistic and healthy body images and recognize the importance of physical activity for overall health and well-being—not just for appearance-focused reasons.

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MORAL REASONING AND SPORTSMANSHIP ATTITUDES

Sport morality is concerned with the beliefs, judgments, and actions surrounding what is deemed ethical or unethical in a sport context (Shields & Bredemeier, 1995). Moral development is the growth and experiential process through which girls learn to reason and act morally. Moral reasoning refers to the cognitive process of deciding between what is right and wrong, ethical or unethical. During the elementary years, children engage in “parallel” reasoning about moral issues in sport and in life; in other words, they use similar reasoning processes in both contexts. As they move toward the early adolescent years, however, they begin to engage in “divergent” reasoning (Bredemeier, 1995); they reason at a higher moral level about daily life issues than they do about competitive sport life issues. Thus, for example, while they might see pushing, elbowing, or punching someone as wrong in daily life, they may view those same actions as acceptable in a sport context because they are “part of the game” or because they serve a goal of getting the ball or scoring the goal. They engage in more “egocentric” reasoning in sport, termed “game reasoning” or “bracketed morality” (Bredemeier, 1995). The longer they stay in competitive sports—in particular sports involving contact—the more they use lower levels of reasoning about moral dilemmas in sport (Beller & Stoll, 1995). When faced with having to choose between displaying concern for an opponent and losing a contest, the pre-eminent choice is to maximize personal gain (Vallerand, Deshaies, & Cuerrier, 1997).

Children in the elementary years who reason about moral issues at a lower level are more accepting of aggressive acts in sport as legitimate (Duquin & Shroeder-Braun, 1996; Shields & Bredemeier, 1995; Solomon, 2004; Stephens, 2001). This pattern continues through the later elementary years, with team norms related to tolerance for aggressive behaviors beginning to predict the aggressive actions of girls and boys. Some researchers have also noted gender differences beginning at this time and continuing through the early adolescent years such that females tend to use higher levels of moral reasoning (Beller & Stoll, 1995; Shields & Bredemeier, 2001) and are more concerned about coach improprieties than are males (see review by Solomon, 2004). By early adolescence those children who find aggressive actions in sport more legitimate are more likely to actually commit aggressive acts in sport contexts. The same appears to hold true for later adolescence, with older adolescents rating coach improprieties as less problematic than they did at younger ages (Duquin & Shroeder-Braun, 1996; Solomon, 2004). Stephens (2001) found that among girls in grades 4 to 12 attending a sports camp, girls’ perceptions of what their teammates do and their willingness to injure others at the request of the coach were the major predictors of their aggressive behavior tendencies. Stephens defined aggression as an intentional verbal or physical action intended to cause injury to another person.



Even though girls may reason from a more mature perspective than males, many girls are socialized to accept aggression and questionable ethical behavior through their years in competitive sport, rather than learning the oft-claimed lessons of good sportsmanship. It is true that there are semantic and confusing distinctions that need to be made in what is meant by “aggressiveness.” “Aggressiveness” is encouraged, developed, and applauded in many sports. For example, adolescent female ice hockey players speak of “the importance of being aggressive, which they define as being powerful and sometimes fearless in use of the body” (Theberge, 2003, p. 497). The difficulty is that coaches, parents, and other adults in youth sport environments often fail to distinguish semantically or otherwise between “good” aggression—using bodies in powerful ways within the rules of play and spirit of the game and not intended to harm opponents—and “bad” aggression—using bodies in ways that are against the rules, harmful to others, self-injurious, or unnecessary.

With respect to sportsmanship attitudes, a substantial number of girls, parents, and coaches report that significant ethical problems, manifested in poor sportsmanship attitudes and behavior, exist in some youth sport cultures. For example, Shields et al. (2005) found among youth sport participants in grades 5 to 8 that 27% report that they had acted like “bad sports.” Fourteen percent of parents admit to yelling at or arguing with sport officials, and 8% of coaches make fun of their athletes, which indicates the behavioral patterns of adults have room for improvement. Four percent of children in this sample described having been kicked, hit, or slapped by their coaches. Sportsmanship programs relying on prosocial behavior theories (e.g., Wells, Ellis, Paisley, & Arthur-Banning, 2005) can be one step toward working to rectify this culture, although systemic change in the philosophical grounding of youth sport structures is essential before meaningful progress toward improved moral climates can be made. Girls must be given explicit opportunities to develop their moral reasoning capacities through physical activity and organized sport experiences.

Physical Activity Affect: What Girls Feel

What girls believe about physical activity, their attitudes toward physical activity and their physical competence, and their previous experiences in physical activity settings influence their affective or emotional experiences in sport. In turn, the affective experiences associated with participation influence future physical activity behaviors. Thus, affect is an important component of physical activity participation because it serves both as an impetus for and a consequence of participation. Both positive and negative affective components are part of physical activity experiences.

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ENJOYMENT

The positive affective states of enjoyment and fun are central to girls' participation in physical activity, and have been common themes in other sections of this report. Fun is the most prevalent reason girls give for participating in sport (e.g., Ehlinger & Katz, 1995; Center for Research on Girls & Women in Sport, 1997; Shields et al., 2005). Enjoyable aspects of sport and physical activity participation encompass a broad spectrum, such as optimal challenges, social connection, intrinsic pleasure in activity, mastery-focused climates, skill improvement, and positive reactions from important adults. Enjoyment in school-based physical activity programs relates to overall level of physical activity (Dishman et al., 2005). Enjoyment is a key component of the sport commitment model (Scanlan, Simons, Carpenter, Schmidt, & Keeler, 1993), and is the strongest predictor of commitment to organized sport (Weiss, 2003; Weiss, Kimmel, & Smith, 2001). When sport is enjoyable, girls are more likely to stay involved (Crocker, Hoar, McDonough, Kowalski, & Niefer, 2004). A task orientation—as opposed to an ego orientation—is more explicitly linked to greater enjoyment, positive engagement, and revitalization (Vlachopoulos, Biddle, & Fox, 1997). Among 11- to 14-year-olds in physical education class, Vlachopoulos et al. (1997) found a positive relationship among task involvement, perceptions of success, and positive emotion. They found an inverse relationship between perceived success and negative affect. Unstructured physically active play, such as that afforded by school recess periods and after-school free play, is a very enjoyable and underestimated source of exercise for girls (Jarett, 2002; Pellegrini & Bohn, 2005; Pellegrini & Smith, 1998). Again, this reinforces that for best retention and adherence to physical activity programs, creating a task-oriented climate that leads to enjoyment is essential.

Creating a task-oriented climate that leads to enjoyment is essential.

STRESS, ANXIETY, AND BURNOUT

Excessive stress leads to physical and mental consequences, such as fatigue, injury, decreased enjoyment, and emotional control problems. Anxiety, an emotional response to a perceived threat that comprises cognitive and physiological responses, is another one of these consequences. Researchers in sport psychology have explored competitive trait anxiety, a relatively stable personality disposition toward anxiety, and competitive state anxiety, an anxiety response in a specific competitive sport situation. Both interpersonal and situational factors affect competitive state anxiety (Crocker et al., 2004; Hall & Kerr, 1997). High trait anxiety, low self-esteem and confidence, and low perceived ability are interpersonal factors predictive of higher state anxiety, as are situational factors such as individual sports, losses, more parental pressure, greater situation importance, and ego-oriented climates. Understanding these antecedents of anxiety can direct coaches and parents toward ways of alleviating anxiety in those under their purview.



The pressures of excessive sport performance expectations, limited control over one's sport participation, and perceptions of stress and anxiety can result in burnout. It is a condition characterized by physical and psychological exhaustion, perceptions of a reduced sense of accomplishment, and no longer caring about sport (Raedeke & Smith, 2004). An array of personal and situational factors affects young athlete burnout, as illustrated in a series of studies on burnout in junior tennis by Gould and colleagues (Gould, Tuffey, Udry, & Loehr, 1996a; 1996b; 1997). Personal factors affecting the burnout of the tennis players included more perfectionist tendencies and less motivation. Situational factors affecting burnout included negative parental influences and unhelpful coaches. Raedeke's (1997) study of 13- to 18-year-old senior level swimmers showed that those whom he labeled "malcontents"—who were swimming because they felt obligated or pressured to and who were unhappy with their participation—scored much higher on burnout than did the other swimmers. Higher burnout among a second sample of 14- to 19-year-old senior level swimmers was related to greater perceived stress, fewer general coping behaviors, and lower satisfaction with social support (Raedeke & Smith, 2004). Burnout is related to coaching behaviors such as less social support, positive feedback, training and instruction, and democratic behavior (Wylleman & Lavallee, 2004) and higher levels of autocratic behavior (e.g., Raedeke & Smith, 2004). Negative consequences of anxiety and burnout include a number of factors such as reduced interest and positive affect, performance decrements, and discontinuation.

Coping consists of those cognitive, emotional, and behavioral efforts that people use to manage difficult life situations. Three dimensions of coping with the stress and anxiety of sport situations have been identified: 1) problem-focused coping (trying to change the situation), 2) emotion-focused coping (managing the emotions associated with the situation), and 3) avoidance coping (removing oneself from the situation). General evidence suggests that girls use emotion-focused coping (in particular, social support) and avoidance coping (in particular, resignation) more frequently than do boys. Minimizing perceptions of excessive stress by providing a more positive and task-involved climate and developing coping and social resources among girls are important mechanisms by which continued participation in physical activity can be achieved.

MENTAL HEALTH

Regular exercise is of benefit to many psychiatric and mental health conditions such as depression and anxiety. Thomson, Pangrazi, Friedman, and Hutchinson (2003) reported a strong association between depression and level of physical activity and health-related fitness among 8- to 12-year-old children. Greater depression was associated with lower

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levels of physical activity. What is not clear is whether depression leads to inactivity, or whether inactivity is a contributor to depression among these children. Crews, Lochbaum, and Landers (2004) found that low-income, fourth-grade children in a six-week aerobic fitness program reported less depression and higher self-esteem at the completion of the program. Motl, Birnbaum, Kubik, and Dishman (2004) observed that changes in physical activity among seventh and eighth grade youth were related to depressive symptoms. Steiner, McQuivey, Pavelski, Pitts, and Kraemer (2000) found that adolescents participating in sports reported fewer mental and physical health problems than did their peers. Better psychosocial functioning has been associated with participation in physical activity among children and youth with developmental disabilities (Block, Griebenauw, & Brodeur, 2004), including decreases in aggression and off-task behaviors, and increases in self-esteem, social competence, and peer relationships (Dykens, Rosner, & Butterbaugh, 1998), and improved social and sport skills (Bernabe & Block, 1994). Physical activity has also been linked to improved general cognitive functioning (Etnier et al., 1997). More research exploring the relationships between physical activity and mental health among girls is needed to help us understand these important connections.

**Adolescents
participating in
sports reported
fewer mental and
physical health
problems than did
their peers.**

Summary and Implications

What is psychologically good for girls in physical activity contexts is very consistent with the tenets of a positive youth development approach. This general approach focuses on how we can use important mechanisms like physical activity to help young people strengthen their perceptions of competence, usefulness, belonging, and empowerment (Minnesota Commission on Out-of-School Time, 2005; U. S. Department of Health and Human Services [U.S. DHHS], 2006). The objectives of a positive youth development approach to offering programs for young people involve the following: promoting social, emotional, cognitive, behavioral, physical, and moral competence; fostering resilience, self-efficacy, and identity; and developing connection and civic engagement (Catalano, Berglund, Ryan, Lonczak, & Hawkins, 1998). These are the same objectives conveyed by the psychology of physical activity literature just reviewed.

Experiences and qualities central to positive youth development include building specific Developmental Assets[®] (Search Institute[®], 2005). Developmental Assets are clusters of positive external assets received via the social climate and social institutions (e.g., support, empowerment, boundaries and expectations, and constructive use of time) and internal psychological assets generated through positive experiences (e.g., commitment to learning, positive values, social competencies, and positive identity) (Search Institute, 2005). Having more Developmental Assets is associated with more positive and successful youth



development (Search Institute, 2005). Girls can develop these assets through properly structured physical activity opportunities as one important avenue for positive youth development (Petitpas, Cornelius, Van Raalte, & Jones, 2005). These opportunities should help girls avoid risk behaviors (Search Institute, 2005), develop healthy lifestyles (Carnegie Corporation of New York, 1996), and strengthen themselves for the challenges of adolescence (Henderson & King, 1998). Targeted programs with institutional and organizational support are key elements contributing to the success of physical activity interventions with girls (Vescio, 2003), and initiatives and programs intended to use sport as a means of inspiring and motivating girls for success in other areas of life such as academics also make valuable contributions to positive youth development (Cadwallader, 2001; Sharp, Kendall, & Schagen, 2003).

In sum, demographic, psychological, behavioral, social, and environmental factors all affect girls' physical activity participation (Motl, Dishman, Saunders, Dowda, & Pate, 2004). This review has focused on establishing what we know about the psychological and social correlates of physical activity participation among female children and youth to serve as a foundation for the next step, which is to identify how ideal physical activity opportunities might be structured for girls in a way that takes into account these multiple influences and builds positive attitudes and competencies. Many of the common recommendations for how to increase girls' physical activity participation are tied to an understanding of the psychological factors that motivate, attract, and retain girls' interest and energy. These recommendations revolve around stimulating interest, promoting engagement, creating a motivating climate, and ensuring success. Our goal is that professionals invested across a broad spectrum of physical activity participation opportunities employ this knowledge in creating psychologically ideal approaches for diverse girls of varied ages and skill levels.

Why is this essential? When we concern ourselves with finding more ways to attract girls to physical activity, facilitate their activity, and keep them motivated and interested throughout their formative years we promote a lifetime pattern of healthy living. Physical activity in the childhood and adolescent years relates to the level of physical activity later in life (Telama, Laakso, Yang, & Viikari, 1997). Sport psychology research findings help us better understand how to sustain the motivation and involvement of those girls who already participate, as well as define how to develop and improve the motivational climate and participation incentives and reduce the barriers for those girls who are inactive.

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CHAPTER 3

Sociological Dimensions of Girls' Physical Activity Participation

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IN THE WAKE OF *Healthy People 2010* (U.S. DHHS, n.d.a) and the *Surgeon General's Call to Action to Prevent Overweight and Obesity* (U.S. DHHS, n.d.b), understanding the role of physical activity and sport in girls' lives takes on special urgency. This chapter on sociological dimensions is based on research on girls' physical activity practices during the last 10 years and updates the 1997 President's Council on Physical Fitness and Sports Report, *Physical Activity & Sport in the Lives of Girls: Physical & Mental Health Dimensions from an Interdisciplinary Approach* (Center for Research on Girls & Women in Sport, 1997). In the original report, priority areas for future research comprised identifying barriers to girls' sport and physical activity participation; determining the best strategies for maximizing girls' sport and physical activity opportunities; examining the impact of participation in sport and physical activity across the lifespan; and paying special attention to activity disparities across racial and ethnic groups, genders, and social classes.

In the current chapter, each of these priorities is revisited and updated where changes have occurred. New resources that have an impact on girls' level of physical activity are also discussed. The good news is that more health experts than ever before are promoting physical activities and sports for everyone, girls and boys, women and men, and at every stage of life. However, several of the barriers to physical activity mentioned in the first report remain in place, and together make it more difficult for girls to adopt an active lifestyle. The following section summarizes the key findings from the original report, as well as highlights changes (or lack thereof) which have occurred in the last 10 years.

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Summary of 1997 Report: What Was True Then, Remains True Today

THE SOCIAL CONSTRUCTION OF GENDER

In 1997, it was argued that providing girls with sufficient physical activity opportunities to reap significant health benefits depended primarily on abandoning the outmoded, stereotypical definitions of femininity and masculinity. Ten years later, this continues to be true, especially as girls enter adolescence and experience pressure to conform to the ideal of “emphasized femininity” (Connell, 1987). Perhaps more than any other factor, gender norms influence the extent to which girls participate in or shun physical activity.

The social construction of femininity mediates girls’ engagement in physical activity and sports. This occurs because values related to physical competence, preferences for types of activities, and styles of movement are closely aligned with gender in our society (Connell, 1987; Hasbrook, 1999; Young, 1990). In particular, certain attributes of athleticism (power, strength, and aggression, for example) are valued for males; these attributes constitute the very definition of masculinity (Connell, 1987; Gorely, Holroyd, & Kirk, 2003). Therein lies the problem. Since gender is typically constructed as oppositional (e.g., males and females are seen as not only different but as opposites), girls may encounter disapproval when they are perceived to be encroaching on male territory by participating in fitness or sports activities. Children learn to “do” gender at a very young age (Hasbrook, 1999; Jacklin & Baker, 1993; Lee, Fredenburg, Belcher, & Cleveland, 1999; Messner, 2000; Stiebling, 1999; West & Zimmerman, 1987). Parents, teachers, siblings, classmates, and playmates all teach children gender norms. Early on, parents tend to handle girl infants and boy infants differently and to ascribe different traits to them (e.g., she’s delicate and fine-featured, he’s robust and active).

Parents and other adults also may have different expectations of girls than of boys (also see Psychological Dimensions chapter). Although most parents tolerate rowdiness and rough and tumble behavior from their sons, fewer parents will tolerate these qualities in their daughters. Even parents who pride themselves on non-sexist child-rearing practices may unintentionally communicate different expectations for their daughters than their sons (Messner, 2000). Similarly, teachers may also inadvertently communicate contrasting expectations for girls and boys in the classroom, at recess, and in physical education classes; for example, that girls be sensitive and caring, boys be tough and physical. But at 4 to 5 years old, the time that many children start school or begin to take part in community sport leagues such as soccer or T-ball, girls are as physically capable as boys (Hasbrook, 1999; Messner, 2000). The kinds of toys girls are typically given contrast with those of boys (Hasbrook, 1999; Messner, 2000). While girls tend to receive toys that develop fine motor skills (make-believe cosmetics, dolls with elaborate wardrobes, jacks, tea sets, coloring books), boys are more



likely to receive toys that develop gross motor skills (sports equipment, camping gear, bikes, skateboards, wagons). Such toys engage different parts of the body and encourage different styles of play.

ENGENDERING PHYSICALITY

These gendering practices ensure that girls and boys, women and men experience their bodies, and hence their sense of self, differently (Young, 1990). From birth, a boy is encouraged to become acquainted with his body, to learn about its capabilities, to test and push his physical limits, in short, to master the complex patterns of skilled movements that we call sports. This physical competence is what defines him as male, as masculine. It is not surprising then that the measure of a boy's masculinity is his success at sports. The association between boys and sports is direct and uncomplicated.

A girl, by contrast, has a much more convoluted path to physical activity and sports. From birth she learns to restrict and inhibit her movements (Young, 1990; Hasbrook, 1999). She is taught to take up less physical space when she sits or stands (Young, 1990; Hasbrook, 1999). In school she learns that she is expected to be obedient, rather than exuberant, quiet rather than noisy, passive rather than active. If the girl dares to insist on her right to be physical, she may be labeled boisterous, unladylike, or a tomboy. For a girl to develop a sense of physical competence, she must actively and assertively breach the limits of femininity. According to this logic, the more girls succeed at sports, the less feminine they appear (Shakib, 2003). The very definition of a girl requires that she be inactive, unphysical, and unskilled at physical activities and sports.

For girls, adolescence is a time when gender is particularly salient (Theberge, 2003). Girls may be encouraged to conform to the social ideal of "emphasized femininity" (Connell, 1987), in which gender differences are intensified. Although adolescent boys' popularity depends directly upon their physicality (i.e., skill at sports), adolescent girls' popularity depends on a complex mix of attributes such as their physical appearance, material possessions, and boyfriends (Adler & Adler, 1998).

THE LINK BETWEEN SPORTS AND SEXUALITY

Many studies show that teenaged girls and boys are rewarded for their gendered behaviors and that social status is directly connected to gender identities. Peer groups often enforce "gender-appropriate" behavior and punish "gender-inappropriate" behavior (Shakib, 2003). Girls who are tough-minded enough to resist peer pressure and involve themselves enthusiastically in sports may be sexually harassed, disparaged, or labeled "dykes" or "lesbians" (Cahn, 1994; Griffin, 1998; Hasbrook, 1999), regardless of their sexual orientation.

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Because sports participation is linked to issues of sexuality in this way, some teenaged girls may avoid physical activity entirely. Other girls are able to ignore homophobic attributions and continue their involvement in sports, but many find the social costs too great. For adolescent girls, society decrees that femininity and physical competence be opposites.

An exception to this rule includes some girls who have reached adolescence after the passage of Title IX in 1972. This legislation prohibits gender discrimination in the provision of athletic opportunities. Many of these girls may believe that they can be athletic without compromising their femininity because they and their friends have many opportunities to participate in sport. And it is true that more girls and women than ever before are taking advantage of these opportunities. For example, one in three high school girls (NFHS, 2007) compete in sport, and the number is higher if recreational and intramural sports are taken into consideration (Heywood & Dworkin, 2003).

This generation of young women declares, “I can do whatever I want,” mimicking the tag lines of Nike’s most successful advertising campaign. Yet when girls and women venture into sports considered the sole province of males—sports like football and ice hockey—they often experience profound hostility and sexual harassment. Other girls may argue that they have a choice: they can be feminine or not, and they will decide for themselves. But the social pressures to be feminine increase as they grow older, and are reflected in the media coverage of young female athletes.

Sportswomen are most often portrayed (when they are portrayed at all) in hyper-feminine, sexualized ways (Duncan, Messner, & Willms, 2005). Although such athletes receive a lot of press, the overriding message is that these women are deserving of attention not because of their athletic accomplishments, but because they are “babes.” On an online site (Cylive, 2007) devoted to the “sexiest women in sports,” women are rated according to their “sexiness quotient.” Photos reminiscent of soft-core pornography feature tennis stars Anna Kournikova and Maria Sharapova, high jumper Amy Acuff (who has posed in the nude for four men’s magazines), Amanda Beard (a swimmer who appeared in the *Sports Illustrated* swimsuit issue and posed nude in *Playboy*), Danica Patrick (a race car driver who has modeled swimsuits for *FHM*), and Anni Friesinger (a speedskater who is nicknamed “Sexy Anni”).

The eroticization of female athletes, then, undermines women’s and girls’ efforts to be taken seriously as sportswomen. Female athletes may say, “See, I’ve become a household name,” but often that is because they have been thoroughly objectified as sex symbols. Although these women and girls may believe that they are independent agents who control their public images, the popular media and scholars suggest otherwise. An American Psychological Association (APA) task force report (APA Task Force Report on the Sexualization of Girls, 2007) outlined the many negative outcomes which can occur as a result of sexualizing females—such as reduced cognitive functioning, low self-esteem, eating

For adolescent girls, society decrees that femininity and physical competence be opposites.



disorders, depression, diminished sexual health, and internalization of stereotypes that far too often place physical attractiveness at the center of girls' value. The report also stated the important role of physical activity in counteracting the many negative outcomes associated with the sexualization of girls. Because physical activity can be a powerful counterweight for negating the effects of sexualizing females, media portrayals of sportswomen become an important tool for teaching young girls to focus on—and honor—what their bodies can do versus what they can look like. Unfortunately, research indicates that compared to male athletes, females are much more likely to be portrayed in ways that highlight their physical appearance instead of their athletic competence. The *APA Task Force Report* provides a compelling summary of reasons why fighting for social change in the ways female athletes are portrayed in the media is a worthy endeavor. And if girls are publicly trivialized as athletes, they may conclude that their participation in physical activity is inappropriate, thereby losing out on the health, developmental, and educational benefits of sport.

Yet with appropriate social support, girls (and women) can become excellent athletes, embodying strength, skill, and discipline. The passage of Title IX has also produced stunning accomplishments on the part of female athletes, including accomplishments over the last decade such as the advent of professional women's basketball, the proliferation of Web sites and magazines dedicated to women's sports and fitness, the so-called "Olympics of the Women" (the 1996 Atlanta Summer Games), the 1999 Women's World Cup Soccer Championship, and numerous other sporting achievements (Duncan, 2006a; 2006b). Despite a long history of male control, there have always been girls and women who contested the notion of sports as a masculine-only domain, for example, Mildred "Babe" Didrikson, Gertrude Ederle, Althea Gibson, Sonja Henie, Shirley Muldowney, Wilma Rudolph, Nancy Lopez, Billie Jean King, Joan Benoit Samuelson, Jean Driscoll, Mia Hamm, the Williams sisters, and countless others. How many more superior female athletes might there be if girls were granted the same access to athletic resources as boys and were encouraged from birth to engage in sports and physical activity (Duncan, 2006c)?

In short, the most salient findings from the 1997 report are ones that remain true today. Gender is socially constructed in a way that prevents many girls from participating in sport. Physicality, while encouraged for boys, is discouraged for girls. Sports and sexuality are linked in two ways. First, adolescent girls who defy the social strictures against sport engagement are put in their place by the threat of being labeled lesbians. Second, even accomplished female athletes are trivialized through the popular media's widespread sexualization of women.

In the following sections, research findings that are new to the 2007 report are presented. The first section addresses the two major barriers that prevent girls from taking part in physical activity and sport: the "hidden curriculum" and the surveillance and

Gender is socially constructed in a way that prevents many girls from participating in sport.

objectification of girls and young women. The former draws on current thinking in pedagogy and sociology of sport. The latter incorporates the findings of media studies, cultural studies, and gender studies. The third section discusses the implications of these findings in light of the “epidemic” of overweight and obesity. The fourth and final section presents a summary and implications of girls’ rising inactivity.

Emergent Research on the Sociological Dimensions of Girls’ Physical Activity

For many children, their first experience of organized sports occurs in school. This is a formative time, as what happens in physical education class or at recess may have long-term effects on kids’ attitudes toward sports and their subsequent physical activity habits and practices across the lifespan (Curtis, McTeer, & White, 1999). In addition, according to the *Healthy People 2010 Information Access Project* (U.S. DHHS, n.d.a.) for a fitness program or for healthy lifestyle in general it is important to consider the kinds of physical activity as well as the quantity. The following describes the typical physical education curriculum and the experiences of girls compared to those of boys.

Because children spend most of their time in school, the type and amount of physical activity encouraged in schools are important components of a fitness program and a healthy lifestyle.

THE “PROBLEM WITH GIRLS”

Numerous researchers (Garrett, 2004; Gorely et al., 2003; Lee et al., 1999; Oliver, 2001; Shakib, 2003; Stiebling, 1999) acknowledge that gender stereotypes are powerful influences on the physical activity behaviors of children, and for girls, work against their own best health interests. Some physical educators have framed the disengagement of girls from physical activity as a “problem” attributable to female recalcitrance (Gorely et al., 2003; Wright, MacDonald, & Groom, 2003). Similarly, popular press coaching books frame coaching girls as “different than” boys in a way that reinforces gender stereotypes and problematizes girls’ sport participation (LaVoi, Becker, & Maxwell, 2007). However, a more likely explanation is provided by Gorely et al. (2003) who argue, “the ‘problem’ lies not with girls, but with the gender order and with physical education as a site in which conventional femininities and masculinities are reproduced” (p. 430), and this is also true for the context of sports.

THE HIDDEN CURRICULUM

Several authors (Gorely et al., 2003; Oliver, 2001; Laker, Laker, & Lea, 2003; Petrie, 2004; Santana, Solmon, Cothran, Loftus, & Stockin-Davidson, 1998; Shakib, 2003; Wright et al., 2003) have examined the traditional subject matter of physical education and concluded that such content (sometimes called the “hidden curriculum” [Garrett, 2004; Ronholt, 2002]) privileges boys while disadvantaging girls. This is especially true in racially diverse schools



because evidence suggests that African Americans and Latinos adhere more closely to traditional gender roles than whites (Ennis, 1999).

The typical approach in physical education classes is a “multi-activity” curriculum in which many sports, most of them team-based, are played for a relatively short span of time with a modicum of instruction (Ennis, 1999). The governing assumptions seem to be that students—girls and boys alike—all have (or should have) a high level of skill, and those who are the most skilled should get most of the playing time and the largest share of the teachers’ attention (Ennis, 1999; Garrett, 2004; Petrie, 2004; Vertinsky, 1995). What is ultimately promoted are “competitiveness, motor elitism, and meritocracy” (Garrett, 2004, p. 225). Contrary to these assumptions, however, students (and especially girls) bring varying levels of skill and ability to physical education class (Ennis, 1999; Garrett, 2004). Those who are less skilled and less able may experience great anxiety and guilt over a poor athletic performance. The highly competitive tenor of these games and the very visible nature of sporting performances impose additional pressure on the girls who are less sure of their skills.

MALE PRIVILEGE/FEMALE DISADVANTAGE

Many researchers (Connell, 1987; Garrett, 2004; Gorely et al., 2003; Hasbrook, 1999; Laker et al., 2003; Messner, 2000; Petrie, 2004; Santina et al., 1998; Theberge, 2000; Vertinsky, 1995; Williams & Bedward, 2001; Wright et al., 2003) contend that most of the physical activities and sports that children learn to play in physical education classes—typically team sports—are celebrations of masculinity, privileging the stereotypical male attributes of size, power, strength, and aggression. Sports in which girls and women have the advantage—those capitalizing on agility and long-term endurance, for example (Theberge, 2000)—are rarely part of the physical education curriculum.

Ennis (1999) points out that the way the physical education curriculum is usually organized lends itself to gender segregation, inequality (among genders and ability levels), and scant learning on the part of girls and boys who are less skilled to begin with. She lists the following features of physical education curricula as problematic:

- Short units of activity with minimal instruction periods.
- Weak or non-existent educational sequences across lessons, units, and grades that limit learning.
- Little or no accountability for using skills strategically in game play.
- Little or no instruction or coached supervision of game play.
- Few, if any, policies to equalize playing opportunities for low-skilled players.
- Required public displays of playing ability.
- Class control exercised by central authority figure(s), minimizing student ownership and leadership opportunities in large classes and constraining learning.

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This list comprises elements of an ego-involving motivational climate detailed in the Psychological Dimensions chapter.

Even when teachers are committed to equitable treatment of their young students, the typical format of physical education class virtually guarantees that many girls will fail. What appears to teachers to be girls' intransigence, laziness, or lack of motivation may be attributable instead to their fear of humiliation and feelings of inadequacy (Ennis, 1999; Garrett, 2004; Petrie, 2004). For many girls, physical education becomes a no-win situation.

For this reason, children may judge boys to be more physically competent in sports, and girls to be less so (Hasbrook, 1999; Shakib, 2003). Even when this is clearly not the case, the perception that girls lack skill and ability in sport may mean that girls must prove themselves before boys will allow them to join their teams (Shakib, 2003; Stiebling, 1999). This perception may also result in some boys' categorical refusals to play with a girl, regardless of her skills (Hasbrook, 1999; Shakib, 2003; Stiebling, 1999).

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Ennis based her curricular and empirical findings on extensive ethnographic research; her participants were racially diverse urban students in 20 middle and high schools on the East Coast. Other empirical evidence in the form of observations and interviews with children support these findings, not only in the U.S., but also in Canada, Great Britain, and Australia, for white children and children of color. For example, the Australian girls in Garrett's (2004) retrospective study reported that teachers and boys who were already skilled because of their previous sport socialization expected girls to perform well in physical education with virtually no instruction or coaching; like the girls in Ennis' (1999) study, these girls were seldom exposed to experiences wherein they could acquire the skills necessary to engage successfully in a sport. For the same reason, the African American and Latino middle school girls in a study conducted by Taylor et al. (1999) "almost without exception ... did not like their physical education classes" (p. 73).

As in Ennis' (1999) study, Garrett (2004) and Taylor et al. (1999) found that girls reported that boys controlled the play in sports, viewed the girls largely as impediments to the game, and monopolized the teachers' attention. Many girls were turned off by the boys' agenda of winning the game and demonstrating a high level of performance and competition, and when girls failed to perform up to these standards they were criticized and humiliated (Garrett, 2004; Taylor et al., 1999).

In Taylor et al.'s (1999) research, the African American and Latino girls expressed the belief that physical education teachers would rather instruct the boys than the girls. The girls complained that their teachers spent most of their time working with the boys, while ignoring the girls. More consequential, when the girls finished school, they felt cheated by physical education, since they lacked a sense of physical mastery and the kind of social



confidence it instills; in fact, most girls believed they were clumsy, weak, and unskilled because of their negative experiences in physical education (Garrett, 2004; Santina et al., 1998; Taylor et al., 1999).

Perhaps this accounts for the widespread finding by researchers that girls consistently perceive their physical competence as inferior to boys and report more negative feelings about their sporting abilities and athletic potential (Lee et al., 1999; MacPhail, Gorely, & Kirk, 2003; Santina et al., 1998; Shakib, 2003). For some girls, such feelings of failure and inadequacy result in a life-long aversion to physical activity (Garrett, 2004; Vertinsky, 1995), even if they started out interested in learning skills and playing sports (Taylor et al., 1999). Girls and young women who see their bodies as flawed, incompetent, and uncoordinated suffer a terrible assault on their sense of self (Garrett, 2004; Oliver & Lalik, 2004; Oliver, 2001).

Similar themes resonated in Santina et al.'s (1998) study of physical education teachers' motivational practices in four large, racially diverse urban middle schools on the East Coast. Although these schools occupied different positions on the continuum of gender stereotyping and inequitable treatment of children, all reverted to (conscious or unconscious) strategies that favored male-dominated sports and served to divide girls from boys.

Overall, team sports comprised the major part of the physical education curricula. At one school the physical education teachers structured the program to allow maximum time for tournaments (mainly featuring team sports), but almost no time for skill mastery or practice. In all schools, when teachers offered choices of sport, they frequently positioned a "female" activity (e.g., dance) against a "male" activity (e.g., football). Furthermore, female teachers taught the "feminine" activity, while male teachers taught the "masculine" activity, reinforcing gender-typing.

When teachers taught boys and girls together, they created "special" rules or conditions for girls (extra points when a girl scored or bonus points awarded to boys who passed to girls) thereby reinforcing the assumption of girls' inferiority and boys' superiority. (In practice this strategy proved futile, since many boys weren't interested in bonus points and dominated play anyway.) At one of the schools, the teachers used less-stringent criteria for grading girls than they did for boys, again reinforcing the assumption of female inferiority, and therefore the gender binary that privileges male physicality (Kane, 1995).

At all four of the schools teachers divided the students by gender for skills instruction and practice. The female teachers tended to exert much more control over the girls' instruction by stopping the play frequently to teach concepts, while the male teachers tended not to intervene and let the boys play with little instruction and stepping in only when disagreements brought an activity to a halt. The teachers at two of the schools gave the girls less activity space than the boys, which resulted in less playing time for the girls. At

For some girls, such feelings of failure and inadequacy result in a life-long aversion to physical activity, even if they started out interested in learning skills and playing sports.

one school, a teacher either discouraged girls' participation, arbitrarily limited the number of girls who could play, or refused outright to let the girls play in activities (e.g., football) that he deemed inappropriate (also see Williams & Bedward, 2001). However, he did not restrict the boys' participation in any activity. Several teachers designated boys as captains of the teams and allowed them to pick whom they wanted as teammates, which led the captains to choose the least-skilled students last—usually girls—while the boys made derogatory remarks about their physical competence.

Finally, when a girl performed well, teachers would use boys as the measure of excellence describing, for instance, a girl as a good athlete because “she plays like a boy” (Garrett, 2004; Santina et al., 1998). Not surprisingly, all of these inequitable teaching practices contributed to the alienation of girls from physical activity.

PHYSICAL EDUCATION TEACHER TRAINING

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next generation.**

Recent studies focusing on how student-teachers learn to teach physical education show that many of them are guided by stereotypical perceptions of sports as gender-appropriate, regardless of the instruction that they received during their four years of college (Laker et al., 2003). In a number of cases, student-teachers relied on teaching models and techniques that they had observed when they were young students taking physical education themselves. Thus, traditional ways of thinking about gender are perpetuated in the teaching of the next generation. Furthermore, some researchers have argued that a key part of professional socialization into physical education instruction entails complicity with the male-dominated norms that prevail in most physical education departments, for example, perceiving dance as having no value for boys and objectifying and sexualizing female students (Brown & Evans, 2004; Brown & Rich, 2002; Webb, McCaughtry, & MacDonald, 2004).

Unfortunately, inequitable and gender-biased practices are not confined to physical education classes. Researchers who have studied children in community-organized athletics report similar findings (Landers & Fine, 1996). In a mixed-gender soccer league, Stiebling (1999) observed that boys demonstrated more task-oriented behavior than girls. Interestingly, she reported that the girls could name all the boys on the team, but none of the boys could name all of the girls. In addition, Stiebling (1999) noticed that a single girl on an otherwise male team was often ignored and excluded, even if she made friendship overtures to the boys. Stiebling interpreted the boys' behavior as an unwillingness to take girls' sport participation seriously.



NEGOTIATING GENDER AND SEXUALITY

Despite the evidence that physical education systematically privileges boys and disadvantages girls, there have always been girls for whom sports and physical activity are so important that they are willing to go against the social norms, regardless of the consequences. A typical strategy for some of these girls is to try to compensate for their athleticism by demonstrating their femininity and heterosexuality in obvious and sometimes extreme ways. Examples of this strategy include dressing in frilly clothes, adorning themselves with hair ribbons, wearing lots of make-up, and acquiring a boyfriend (e.g., Shakib, 2003); in short, exploiting the signifiers of femininity. Other girls may temporarily drop out of sports until some of the pressure subsides, then take them up again later (Shakib, 2003). Still others simply ignore the homophobic remarks and stay the course, difficult though it may be. These girls show admirable persistence, but no one should have to endure the kind of social censure these girls must face. The price they pay may be incalculable.

The themes that arise from the literature thus far are congruent. Scholars point out that despite the received physical education wisdom, the “problem” of girls’ disengagement is not due to female intransigence, but rather to the gender order that produces conventional femininities (and masculinities). Physical education teachers, sometimes unknowingly, follow a “hidden curriculum” that disadvantages girls while privileging boys. Teacher training in physical education is itself positioned to produce teachers who reinforce stereotypical ideas about femininity and masculinity. Finally, girls who wish to play sports despite the difficulties already outlined must resort to various strategies to reaffirm their femininity.

Girls themselves should guide the selection of movement activities.

DESIGNING GIRL-FRIENDLY PHYSICAL ACTIVITY PROGRAMS

Based on the findings from the previous section, the following section describes the way in which typical physical education courses (multi-activity, team-based, strength/power sports) must be changed in order to be “girl-friendly.” In addition, it includes a discussion of a model that might be used in place of the current physical education curriculum.

First, the girls themselves should guide the selection of movement activities. Listening to girls’ needs and desires is paramount. However, some general principles could be observed. The kinds of team-based programs that traditionally comprise physical education are probably not appropriate for most girls since they reproduce the inequitable outcomes described throughout this chapter (Ennis, 1999; Gorely et al., 2003; Vertinsky, 1995).

Instead, many experts believe that a large range of early learning movement experiences will prepare children for more complex physical pursuits and contribute to their later movement competence (Garrett, 2004). Learning to throw, kick, hit, and serve a ball, for example, would be useful. Learning how to swim, how to move the body in

aesthetically pleasing ways, how to build strength and endurance, and how to defend oneself would also be important. Learning about nutrition, relaxation, and stress management are additional possibilities. Such instruction would be especially important to children of lower socioeconomic means and children of color who may not have the resources available to white children of higher socioeconomic means (e.g., discretionary time and money for sports leagues, private lessons, sports equipment) (Armour, 1999; Ennis, 1999; Hasbrook, 2005; Wright et al., 2003). Skills that prepare girls and boys for lifetime leisure pursuits may be particularly valuable (Vertinsky, 1995) and some research suggests that kids who are exposed to physical activity at a young age are more likely to participate as young adults (Curtis et al., 1999; Hasbrook, 2005).

Other experts have focused less on the content of physical education and more on the methods of motivating, teaching, and evaluating students and on the activity climate itself (see Psychological Dimensions chapter). Lee et al. (1999) advocates individualized learning, rewarding students for improvement and effort rather than for ability, and providing specific feedback related to students' performance of the physical activity task. MacPhail et al. (2003), Taylor et al. (1999), and many others recommend that instructors motivate students by emphasizing sports' intrinsic rewards—fun, pleasure, self-knowledge—rather than emphasizing extrinsic rewards such as beating one's opponents, demonstrating superiority, and winning the game.

Researchers also have argued that it is imperative to create a safe, accepting environment, one wherein girls are not ignored or ridiculed for poor athletic performances. Teachers would provide cross-gender models (males would instruct dance, and females would teach football), and everyone would be taught to respect gender, racial, ethnic, and cultural differences (Amour, 1999; Santina et al., 1998; Taylor et al., 1999).

Santina et al. (1998) recommend a broad curriculum that includes non-competitive as well as competitive activities and that develops cooperative learning between female and male students—convey[ing] a message that all students are valued. One interesting model that fits this description was proposed in Ennis' (1999) research: *Sports for Peace* (SFP). SFP differs radically from the traditional team-sport format typically used in physical education classes by creating:

... teams of relatively equal skill and playing ability. Teachers appoint student coaches to assist players in improving their performance and to monitor the team environment to enhance the engagement and affiliation of every team member. Players rotate through team positions taking a regular turn at the duties of statistician, scorekeeper, and official. Unlike short, multi-activity units, sports units or "seasons" extend seven to nine weeks ... to enhance students' skill development and affiliation with teammates promoting care and concern with others. (p. 36)

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Perhaps the most radical features of SFP are the emphases on care and concern for other players, student ownership of the game, conflict negotiation, trust and respect for all individuals, and grading based on cooperation rather than competition.

Ennis is careful to point out that although the SFP model offers genuine opportunities for less-skilled players, more skill-based learning, and increased recognition for the contributions made by girls, it does not create a truly equitable environment. While it may improve the climate for girls' participation, it does not attempt to counter the larger social forces that created the gender order in the first place. In short, it does not challenge masculine privilege in our society (Laker et al., 2003; Santina et al., 1998). Even so, SFP is clearly superior to the multi-activity models currently so popular in physical education, and that in itself is promising.

THE FEMININE IDEAL AND THE OBJECTIFICATION OF FEMALE BODIES

The “hidden curriculum” is one major barrier that girls must overcome in order to benefit from physical activity. The other barrier is not a curricular issue at all; instead, it is a larger social issue with implications for pedagogy—the sexualization and objectification of female bodies in our society. This section discusses the impact of popular media on beauty ideals for girls.

No age group is more focused on bodies and appearance than adolescent girls (Bunyan, Kelly, & Letts, 1998; Guinn & Semper, 1997; Oliver, 2001; Oliver & Lalik, 2000). Well before girls reach puberty, they learn about the white female body ideal from the popular media. They recognize and can describe the extremely slender, toned, flawless, perfectly proportioned standard that they are supposed to emulate, for images of it abound in magazines, television, movies, newspapers, videos, billboards, books, the Internet, and other forms of advertising (Duncan, 1994; Eskes, Duncan, & Miller, 1998; James, 2000; Wolf, 1992). There is some evidence that media depictions of African Americans and Latinos suggest a more diverse set of body ideals, but the findings remain somewhat equivocal in this area (Hebl & Heatherton, 1998). In general, little girls learn about the body ideal by playing with Barbies and a variety of fashion dolls that embody the societal ideal of slimness, long legs, small boyish hips, a tiny waist, and full breasts.

At a very young age, girls know that their mothers, sisters, teachers, and, sometimes, female classmates have subjected themselves to diets for the sole purpose of reducing their bodies to conform to this ideal. Girls learn early and repeatedly that a major source of social power available to them is their physical appearance and that they should strive to enhance it because their popularity with peers (and sometimes adults) depends upon it (Adler & Adler, 1998). They are also taught, by our commodity culture, that it is every girl's individual responsibility to become perfectly thin and perfectly beautiful and that her figure and facial

No age group is more focused on bodies and appearance than adolescent girls.

“flaws” must be overcome by purchasing beauty and diet products (Duncan, 1994; Eskes, Duncan, & Miller, 1998; Spitzack, 1990). Glossy magazines tell her that if she fails to measure up, it is because of her own personal shortcomings (Duncan, 1994; Eskes, Duncan, & Miller, 1998; Markula, 1995; Spitzack, 1990). Unless they have received media literacy training, most girls do not realize that the purpose of advertising is to create a sense of personal inadequacy.

When girls reach adolescence, the pressures to conform to the dominant feminine ideal increase, as teenaged peers strictly patrol the boundaries of gender (Shakib, 2003). Because of the omnipresence of the body ideal, girls begin to internalize a sense that their bodies are on display and being judged critically (Garrett, 2004; James, 1999; Oliver & Lalik, 2004). Many girls experience their bodies as deficient since they do not match the carnival of flawless media images (Garrett, 2004; James, 1999). Girls of color are placed in an impossible position, since the standard of beauty in Western culture is white skin, blonde hair, and blue eyes (Collins, 2000; Duncan & Robinson, 2004; hooks, 1992). African American, Asian American, Latino, and Mexican American girls simply do not resemble this beauty ideal, nor will they ever.

Most girls do not realize that the purpose of advertising is to create a sense of personal inadequacy.

Building on notions of ideal femininity and masculinity already circulating in society, girls may believe that their social status depends upon their degree of conformity to the female ideal (Guinn & Semper, 1997; James, 2000; Taylor et al., 1999). This perception may be accurate, given what we know about the sources of female social status in school (Adler & Adler, 1998).

Taking their cues from stereotypical portrayals of athletes in the media, adolescents may “gender type” physical activities, perceiving certain sports as appropriate only for girls and others as appropriate only for boys (Garrett, 2004; Gorely et al., 2003). Girls and boys negotiate the meanings of such sports, but often their measure of appropriateness depends in part upon the types of bodies that are produced through that sport or activity. For example, both girls and boys may find highly muscular women (e.g., female bodybuilders [Gorely et al., 2003]) to be grotesque because of their size and defined musculature, qualities typically associated with males.

Activities may also be seen as gender-appropriate according to their degree of aggression, physical contact, action, or aesthetic appeal (Garrett, 2004; Gorely et al., 2003; Metheny, 1965). In general, the media present individual sports with an aesthetic component (such as figure skating, gymnastics, or diving) as most appropriate for girls (Duncan & Hasbrook, 1988; Kane & Snyder, 1989), and these sports tend to produce slim, toned bodies, much like the female body ideal. On the other hand, media often portray team sports, sports that require lots of body contact, and sports that capitalize on aggression (such as football, boxing, or rugby) as only appropriate for boys (Duncan, 1990; Kane & Snyder, 1989); these sports tend to produce large, muscular bodies.



THE SURVEILLANCE OF GIRLS AND WOMEN

There is much empirical evidence that surveillance of girls' bodies, once they reach puberty, intensifies and routinely occurs in sport and physical activity settings (Garrett, 2004; Gorely et al., 2003; James, 2000; Oliver & Lalik, 2004; Webb et al., 2004). Girls may feel particularly vulnerable there because their bodies tend to be more exposed in athletic wear or bathing suits (James, 2000; Taylor et al., 1999; Webb et al., 2004). Again, media provide an unending catalogue of girls' and women's bodies, especially in glossy fashion magazines, but also in fitness-related magazines such as *Shape* or *Self* (Duncan, 1994; Eskes, Duncan, & Miller, 1998; Markula, 1995; Poulton, 1997). Both kids and adults are accustomed to seeing female bodies in various states of undress splashed all over the pages of their favorite magazines, so the habit of gazing at and evaluating these bodies and body parts becomes almost second-nature, unremarkable. It is therefore not surprising that girls report that their peers (both female and male) watch and comment about their bodies and, particularly, their bodily deficiencies (James, 2000). As mentioned earlier, the popular press often trivializes female sporting accomplishments by sexualizing female athletes with conventionally beautiful bodies and faces. In so doing, the media represent a very narrow range of female body types: the toned, taut, "heterosexy" shape.

In some cases, it is girls' athletic prowess that is being evaluated. In other cases, the gaze is frankly sexual. For example, in Webb et al.'s 2004 study, female physical education teachers reported that their male colleagues appraised girl students' bodies and ranked their body parts (e.g., "best legs"). Male physical education teachers did not limit their sexual gaze to students; they also turned it on their female colleagues, as in the case of one male physical education teacher who advised his female physical education colleague to get breast implants (2004).

Girls know when they are being watched, and most chafe under the objectifying gaze (Garrett, 2004; James, 2000). Taylor et al. (1999) noted in their study of African American and Latino middle school girls that they were especially concerned about how they looked in their physical education classes when boys were present. To cope with this sense of surveillance, many girls develop avoidance strategies (James, 2000) such as avoiding public swimming pools, exercising during unpopular times when there are fewer people about, or shunning physical activity entirely.

It is dehumanizing to be judged by one's exterior, whether one is found wanting or not (Armour, 1999; Garrett, 2004; Webb et al., 2004). Girls and women learn to internalize the objectifying gaze and turn it on themselves; thus, they may feel that they are always on display. Although there are small modifications that can be made to one's appearance, there is relatively little that girls and women can do to substantially change the way they look,

The popular press often trivializes female sporting accomplishments by sexualizing female athletes.

especially in the face of child-bearing and aging. That we live in a youth-obsessed society renders girls' and women's status more problematic.

This surveillance beginning in adolescence is the logical expression of a gender order that is potentially damaging both physically and emotionally to girls (APA Task Force on the Sexualization of Girls, 2007; Garrett, 2004; Gorely et al., 2003; Guinn & Semper, 1997; Oliver & Lalik, 2004; Roth, 2002; Santina et al., 1998; Webb et al., 2004; Young, 1990). Furthermore, when race and class are factored into the equation, the consequences of surveillance may be qualitatively different and more oppressive when girls are also members of non-dominant cultural groups (Armour, 1999; Collins, 2000; Garrett, 2004; Gorely et al., 2003).

The research relating to media portrayals of the female ideal, the objectification and sexualization of female bodies, and the surveillance of girls and women constitutes the second thematic section in this chapter.

CHALLENGING THE CULTURE OF SURVEILLANCE

Physical education
teacher and coach
education curricula
should increase
expertise of adult
leaders so they may
facilitate cultural
media literacy in
their students and
athletes.

The following section describes how parents, educators, and coaches can help girls challenge the sexualization and surveillance of female bodies in our society. According to Oliver (2001), "Both the messages girls receive about their bodies through popular cultural images, as well as the ways in which girls learn to think and feel about their bodies, have implications for physical educators" (p. 145). Along these lines, a number of researchers suggest that physical education curricula should explicitly help girls critique the current emphasis on the female body ideal and the exploitation and objectification of women's bodies (Armour, 1999; Bunyan et al., 1998; Garrett, 2004; Gorely et al., 2003; Lee et al., 1999; Oliver, 2001). Similarly, physical education teacher and coach education curricula should increase expertise of adult leaders so they may facilitate cultural media literacy in their students and athletes. Garrett (2004) concurs, arguing that given that young women come to understand themselves in terms of their bodies, there is also a distinct need for them to have significant opportunities to critically examine their own lived experiences of their bodies, and physical education and sport are logical contexts in which to undertake such examination.

As a starting point, many scholars in pedagogy believe that sport and physical education classes should directly address girls' experiences of their bodies (Bunyan et al., 1998; Garrett, 2004; Oliver, 2001; Oliver & Lalik, 2004), a topic that is largely neglected in most educational settings. In her research, Oliver (2001) identified some key questions that might help girls think through the issues: "1) how girls who play sports feel about their bodies; 2) how girls who play sports are represented in culture; 3) how girls who exercise regularly feel about themselves; 4) how teens feel about physical activity, and 5) whether regular physical activity helps girls gain more self-confidence" (pp. 160-161).



In a related study Oliver and Lalik (2004) identified a girl-centered curriculum strand, based on their years of work with adolescent girls, that could serve as a template. For example, in their 2004 study the authors let the girls set the agenda about topics relating to their bodies. Girls chose to discuss “fitness, fashion, shoes, cute boys, hairstyles, food, beauty, body products, articles [they] read, and people [they] admired” (p. 173). Girls also talked about teen fashion magazines and analyzed the images that they found on the pages. They preferred to express their thoughts about these images through artistic representations and journal entries. They also created photographic essays, designed calendars of key social events at school and at home, and after reflection shared their ideas about the female body and their own bodies in small groups.

A crucial element of this curriculum was critiquing the public discourse—the limiting and oppressive messages about gender and femininity—that shape girls’ everyday experience of their bodies. In Britain, these curricular materials are called “critical literacy,” in which the student’s “agency ... [is] enhanced through critical examination of language and culture” (Wright, cited in Oliver & Lalik, 2004, p. 163).

Along these lines, programs for girls need to include critical examination of the commercial uses of the female body ideal. In part, this means designing media literacy materials that help all children understand and critique the profit-driven purposes of the beauty/fashion/diet industries and the embedded messages they produce. All forms of media should be addressed including television, videos, movies, magazines, and the Internet. The lower grades of primary school are not too early to introduce kids to advertising and the role it plays in our culture. However, it should be noted that research on media literacy programs specifically aimed at promoting positive perceptions of body image is equivocal. Some work suggests that long-term programs can be effective in reducing body dissatisfaction and the internalization of the thin ideal in young women (Irving, DuPen, & Berel, 1998; Watson & Vaughn, 2006), but other research fails to demonstrate improved body image for young women (Irving & Berel, 2001) or improved body satisfaction for pre-adolescent girls (McVey & Davis, 2002). These mixed results should not prevent inclusion of media literacy, but indicate that programs must be well designed and evidence-based.

This kind of media literacy instruction must be directed at both girls and boys, since both are influenced by media images, and together their expectations and beliefs fuel the social construction of gender (Ennis, 1999; Garrett, 2004; James, 2000; Lee et al., 1999). In brief, girls and boys need to understand the powerful commercial interests that underlie ideal images of femininity (and increasingly, masculinity) (Ennis, 1999; Garrett, 2004; James, 2000; Lee et al., 1999). Girls and boys must also learn that the white beauty ideal, based on a narrowly defined “look,” is sexist, racist, and classist, if applied to every

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woman. They must be taught that bodies come in a variety of shapes, sizes, and colors and that no one standard is appropriate for all girls and women or superior to another (Guinn & Semper, 1997).

On a larger scale, teachers must help girls and boys challenge the inequitable educational practices that clearly privilege boys and men, while disadvantaging girls and women. This means providing time for critical reflection (during physical education and perhaps in other classes) about why certain activities may be empowering for one gender while being simultaneously disempowering for another (Bunyan et al., 1998; Gorely et al., 2003; Guinn & Semper, 1997; Oliver, 2001; Oliver & Lalik, 2004). Getting children to think critically about the gender order will take time, effort, and persistence, but it is not an impossible task.

Athletic models for girls should include girls and women who are skilled at many kinds of physical activities, not only traditional sports but also non-traditional movement forms such as yoga, Pilates, the martial arts, dance, and various fitness activities. All girls should be given the opportunity to be active, healthy, and physically capable. Unfortunately, the current educational system and many community- and school-based sport leagues fail to provide the kind of sporting environment that might make it possible for most girls to reap social, emotional, and health gains. If anything, the current sporting environment is often toxic and actively harmful to girls by poisoning their physical activity experiences, increasing their sense of the objectifying gaze, and eroding their self-esteem (Armour, 1999; Webb et al., 2004). Although participation in sport and physical activity provides a wide array of health benefits (some of which are addressed in other chapters), the next section focuses mainly on the *social* rewards of being fit.

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THE SOCIAL EMPOWERMENT OF GIRLS

A knowledge of one's body is critical to the work of adolescence: the development of identity (Armour, 1999). Many girls gain self-knowledge by testing their limits (physical and mental) in sport and physical activity, and through information gleaned from social agents such as peers, coaches, and parents. Participation in athletics provides unambiguous and reliable feedback about one's skills, something rarely experienced in such a clear-cut way in other spheres of life. Some researchers argue that engagement in sports helps teens accrue social capital, that is, social ties with some sort of value to the individual, often providing benefits such as information and resources (Armour, 1999; Broh, 2002).

Another social benefit of sport participation is the camaraderie, being part of a group with a higher goal (MacPhail et al., 2003), and making friends or maintaining friendships through sports (Garrett, 2004; Taylor et al., 1999). Experiencing cooperation and leadership as a member of a team can be affirming experiences.



As individuals, girls may derive real satisfaction from their own physical mastery, exerting control over their bodies (Garrett, 2004; Vertinsky, 1995). Scholars have repeatedly found that a positive body image translates into self-esteem (Gorely et al., 2003; Guinn & Semper, 1997; Taylor et al., 1999). Further, knowing that one is sufficiently strong and capable to overcome stereotypical social constructions of femininity as fragile, helpless, and limited (Garrett, 2004) can be an empowering experience. Girls feel more confident and self-assured when they can handle themselves physically and feel like they could defend themselves if necessary (Gorely et al., 2003; Vertinsky, 1995). Perhaps the greatest pleasure that girls can experience comes from the intrinsic rewards of fun, agency, absorption, and focus—hallmarks of skilled participation in a physical activity or sport (Csikszentmihalyi, 1998; Gorely et al., 2003; Hasbrook, 1999).

In sum, recommendations for progressive physical activity education fall into two categories. The first relates directly to movement education and suggests a new sports and physical activity model—SFP. The second involves critical literacy instruction, that is, teaching girls to critique the cultural practices that objectify and sexualize girls and women. Ideally, these two components would articulate at different points the essential elements necessary for girl-friendly physical activity programs.

Much of this chapter has presented a rationale for severing the link between femininity and inactivity. However, the next section describes some recent developments—in fact, a growing public crisis—that make girls’ participation in sports and physical activity even more important. It touches on the health consequences and, perhaps more significant for the purposes of this chapter, the social consequences of a key societal problem.

COMPOUNDING THE PROBLEM: GIRLS, OVERWEIGHT, AND OBESITY

In the last decade experts have argued that the U.S. is in the grips of an obesity epidemic. The Surgeon General has issued a call to action to “prevent and decrease overweight and obesity” (U.S. DHHS, n.d.b), and the CDC and DHHS have issued similar appeals. Thirteen percent of children (ages 6 to 11) and fourteen percent of teens (ages 12 to 19) were overweight in 1999, representing a threefold increase over the last 20 years (U.S. DHHS). This health issue takes on particular urgency for young people because their later eating and physical activity habits are influenced by their childhood practices (U.S. DHHS, n.d.a). According to the Surgeon General’s office, teenagers who are overweight have a 70% risk of becoming adults who are overweight or obese. This risk rises to 80% if one or both parents are themselves overweight or obese (U.S. DHHS). The negative health consequences of overweight and obesity are well known: high blood pressure, Type 2 diabetes, heart disease, and certain kinds of cancer (see Physiological and Metabolic Dimensions chapter).

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What have received less attention are the negative social consequences. Children have identified the major outcome of overweight/obesity to be social discrimination (U.S. DHHS, n.d.b.; Pierce & Wardle, 1997). Regrettably, our culture views overweight/obesity as a moral failing (Crocker, Cornwell, & Major, 1993; Gard & Wright, 2005). As one of the last bastions of prejudice and one of the worst, overweight/obesity elicits contempt, disgust, ridicule, and censure (Herndon, 2002; LeBesco, 2004; Moore, 2005).

Once again, the media have played a role in reinforcing this prejudice (Herndon, 2002). Magazines, television, and movies suggest that obesity/overweight is an individual problem susceptible to individual solutions (Duncan, 1994; Eskes et al., 1998; Spitzack, 1990). Most popular media imply that being overweight or obese results from a person's lack of willpower, and anyone with a modicum of self-respect could (and should) do something about it (Blaine & McElroy, 2002; Duncan, 1994; Eskes et al., 1998; Herndon, 2002; Spitzack, 1990).

This ideology is used by advertisers to get people to buy their diet aids, exercise equipment, meal plans, and related products (Poulton, 1997). Furthermore, the \$50 billion diet industry (Fraser, 1998) is fueled by media depictions of a body ideal that verges on emaciation, one that is extremely difficult for any girl or woman to achieve. Those who attain this state of extreme thinness are not only considered beautiful; in line with popular media portrayals, she who is gorgeous is also judged positively in her behaviors and traits, a phenomenon also known as the "Halo" effect (Langlois et al., 2000).

On the flip side, in books, movies, and television, overweight and obese characters are frequently portrayed as stupid, unhappy, greedy, incompetent, lazy, and/or self-indulgent (Blaine & McElroy, 2002; Herndon, 2002). Caricatures though these may be, these portrayals clearly have currency in our society, particularly in dominant white culture. Yet far from being the consequence of a character flaw, many experts believe overweight and obesity to be a very complex problem in which heredity, weight-cycling (repeated loss and regain of weight), contemporary lifestyle, and physical environment are all implicated (Campos, 2004; Ernsberger & Koletsky, 1999). In brief, it would not be inaccurate to say that the nature of the problem is at least as likely to be societal as it is to be individual (Campos, 2004).

Children and adolescents can be cruel, and one of the unfortunate targets of this cruelty is overweight and obese kids (Moore, 2005; Pierce & Wardle, 1997). Other children may taunt, abuse, or ostracize their overweight classmates (Ellin, 2005; Moore, 2005; Pierce & Wardle, 1997). The costs associated with this kind of social discrimination—low self-esteem and depression—are too high for anyone, much less a child, to have to pay (U.S. DHHS, n.d.b).

Physical activity plays a key role in helping children and teens to maintain a healthy weight (U.S. DHHS, n.d.a). Because our lives have become so sedentary, the only exercise most kids get is during physical education or school/community sports. When those options

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are foreclosed, the results are predictable: children become overweight or obese, especially girls, since they are more likely than boys to be socialized to avoid physical activity. This is particularly a problem for girls who are members of cultural minorities and girls who come from economically deprived backgrounds (U.S. DHHS). Rates of overweight are higher in African American girls than in Mexican American or non-Hispanic white girls (U.S. DHHS). White teens from families with less income are more likely to be overweight than girls from families with more income. Girls with disabilities show lower rates of exercise than girls without disabilities (U.S. DHHS). One of the key objectives for *Healthy People 2010* is to eliminate such disparities in levels of physical activity and fitness. But before that can happen, we need to start thinking about girls' health—and especially their physical activity participation—in new ways.

Summary and Implications

THE TRIPLE CROWN OF DISADVANTAGE

The critical message of this chapter relates to the causes of girls' alienation from physical activity. For girls and women, the avoidance of sports and exercise is connected to the social and cultural structures of our society, and any initiative that ignores this relationship is likely to fall short of its goal. *Gendering practices tend to promote limiting ideas of what behaviors are appropriate for girls; skill at sports and physical activity is not considered one of them.*

Girls' disengagement from sport is also linked to the typical format of physical education classes, *which privileges boys and disadvantages girls. Implicit in most physical education classes is a female deficit model. Girls are deemed less talented, less coordinated, less skilled, less motivated, and less successful at sports than boys.* At best, girls are thought to need special rules and remedial instruction; at worst, they are humiliated, discriminated against, or ignored.

Finally, at a time when their bodies are changing in unsettling new ways, girls become the objects of surveillance. In gym clothes or bathing suits, girls feel especially vulnerable to the evaluative gaze. *They begin to compare their appearance with the images they see in the popular media, images so difficult to attain that even the bodies of fashion models are corrected using computer technology.* Because these portrayals are so ubiquitous, extending even to accomplished female athletes, they often make girls feel insecure and vulnerable. The educational establishment could help girls understand that their self-esteem need not depend on conformity to these images, yet it remains mute and disinterested. In effect, girls labor under a triple handicap.

Gendering practices tend to promote limiting ideas of what behaviors are appropriate for girls; skill at sports and physical activity is not considered one of them.

The significance of severing the link between femininity and physical activity stands out in especially sharp relief against the “epidemic” of overweight/obesity. The more sedentary girls are, the more likely they are to become one more statistic in the *Surgeon General’s Report*. Physical activity offers an intrinsically rewarding experience, but it also helps girls maintain a healthy weight, in addition to its many other developmental health benefits. As a remedy, physical activity is safer and more efficacious than diets, herbal preparations like Phen Fen, or bariatric surgery, which are at best forms of crisis intervention rather than long-term solutions. Instead of relying on extreme countermeasures, we need to learn how to make changes that affect our girls’ health and well-being in the most fundamental way.

Fortunately in the last decade, scholars in pedagogy and gender studies have suggested some ways to make physical activity more relevant to girls. The strategies described earlier in this chapter and in the “Best Practices” chapter seem promising. Although they will not eradicate the major source of the problem—the inflexibility of our gender order—they can improve the current climate for girls by giving them agency over their own bodies. As concerned parents, educators, and supporters, we are obliged to safeguard our girls’ health. Too much is at stake for us not to act on this understanding.

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CHAPTER 4

Physiological and Metabolic Dimensions of Girls' Physical Activity

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IN THE TEN YEARS SINCE THE PUBLICATION OF THE INAUGURAL President's Council on Physical Fitness and Sports Report in 1997, additional evidence about the physiological and metabolic benefits of physical activity and sport in the lives of girls has emerged. In section I of the original report, Freedson and Bunker (Center for Research on Girls & Women in Sport, 1997) concluded that girls' participation in physical activity and sport positively impacts aerobic power, and that muscular strength and endurance can be increased through regular participation in sports and exercise activities. While the original report recognized that girls' early involvement in physical activity and sport can reduce the likelihood of developing risk factors for chronic diseases, concerns about athletic injuries, amenorrhea, and the development of deleterious chronic conditions were also recognized as potential risk conditions that can result from high-level physical activity.

In 2000, the *Healthy People 2010 Report* identified objectives for adolescents related to physical activity and fitness that focus on obtaining regular moderate and vigorous physical activity and reducing sedentary behaviors (U.S. DHHS, 2000a, 2006). Objectives focused on decreasing sedentary behaviors and increasing regular physical activity levels in order to control body weight and reduce the development of chronic disease risk factors. In the past decade, research about physical activity and sport of girls has addressed questions about the longitudinal transfer of youth aerobic fitness, physical activity, and sports participation into adult physical activity behaviors and health outcomes. Research has focused on the effects of high-intensity sports participation on bone, muscle strength, and reproductive systems, explanations for increasing levels of overweight and/or obesity and correlates of body weight in adolescents, and the effects of interventions to reduce the decline in girls' physical activity

upon entering adolescence. This chapter provides an overview of emergent research of the physiological and metabolic benefits of physical activity and sports participation in girls as well as a summary of implications and the potential deleterious effects which can result from girls' physical inactivity.

CARDIORESPIRATORY FITNESS

Cardiorespiratory fitness is referred to as aerobic power, which reflects the capacity of the cardiovascular, respiratory, and metabolic systems to transfer energy from food into physical work. Girls with higher levels of aerobic power are able to perform at a higher physical capacity while utilizing oxygen to transfer energy into work output. Aerobic power prevents mobilization of anaerobic energy systems associated with fatigue and promotes the ability to perform for prolonged periods of time. Correlates of aerobic fitness include a better ability to dissipate body heat, increased efficiency in removing circulating stress hormones associated with physical effort, lower levels of blood pressure, more favorable lipid, glucose, and insulin profiles, and increased efficiency in controlling body weight. Hence, participation in regular physical activity consistent with the American College of Sports Medicine (ACSM) recommendation for increasing cardiorespiratory fitness (vigorous intensity exercise at a heart rate of 70% of maximum or higher, 3 to 5 days/week, for 15–45 minutes/session) aids in sports performance and is health enhancing (ACSM, 1998).

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Until recently, little was known about the distribution and trends of cardiorespiratory fitness levels among adolescent girls in the U.S. In 2006, Pate, Wing, Dowda, Farrell, and O'Neil reported findings from the 1999–2002 National Health and Nutrition Examination Survey (NHANES), a national survey of the health status among U.S. adults and youth. Results of treadmill exercise testing in adolescents revealed that aerobic power was higher in boys than in girls, aerobic power decreased linearly for older and overweight girls, and nearly one third of girls were ranked in the low cardiorespiratory fitness category. This finding translates into an estimated 7.5 million U.S. adolescent girls who would be categorized as “low fitness.” Higher fitness levels in girls were associated with walking or bicycling to school, engaging in daily moderate and vigorous activity, regular strength training, watching fewer hours of television and/or videos, and working less on computers each day.

STRENGTH AND POWER

Muscular strength is the ability of a muscle to generate force. Isotonic, or dynamic, strength is measured as the maximum amount of force a muscle or group of muscles can generate throughout the range of motion of a joint. Dynamic strength is often measured on weight machines by determining the maximum weight a muscle group can move/lift one time throughout the full range of motion—often called the “one repetition maximum” (1 RM).



Isometric, or static, strength is the ability to exert force at a given joint angle, with no movement of the limb. Power is defined as strength exerted per unit time. Most sports and physical activities require power rather than strength alone. Power is often measured in children and young adults by a vertical jump or standing long jump. Although strength and power are largely genetically determined, both can be increased through exercise training.

Strength and power increase linearly in girls from pre- to post-puberty, after which the rate slows or may decline in sedentary girls throughout their teen years as they reach sexual maturation and increase body fatness (Froberg & Lammert, 1996). However, strength and power may continue to increase throughout adolescence in girls who participate in activities that incorporate some form of resistance/power exercise such as jumping or sprinting.

Prior to the mid-1990s there was considerable disagreement among physicians and physiologists as to the benefits and risks of resistance training in children and adolescents. However, recent research indicates supervised resistance training is both safe and effective in increasing dynamic strength and muscular endurance in pre- and early pubescent girls (Faigenbaum, Westcott, Loud & Long, 1999; Faigenbaum et al., 2002; Falk & Tenenbaum, 1996), without increasing risk of injury or incurring adverse effects on growth (American Academy of Pediatrics, 2001). Comparison of training protocols shows strength and muscular endurance in children are most efficiently improved by a protocol consisting of one set of 13 to 15 repetitions performed twice a week (Faigenbaum et al., 2002). It should be noted, however, that child-sized machines were used in those studies. Adult-sized machines might not be appropriate for all children, as they might increase the likelihood of injury and limit the child's ability to perform an exercise correctly and throughout the full range of motion. Fitness instructors working with children must be aware of these limitations and modify or exclude exercises accordingly.

In 2001, the American Academy of Pediatrics published specific recommendations for strength training programs for children which include a pre-program medical evaluation by the child's pediatrician, then 1 to 2 days/week of moderate-intensity strength exercises (1 to 15 repetitions), coupled with aerobic exercise and fitness games (American Academy of Pediatrics Committee on Sports Medicine and Fitness, 2001). Initially, all exercises should be performed with no resistance until good form is mastered and progression in resistance should not occur until successful completion of 10 to 15 repetitions.

REPRODUCTIVE FUNCTION: MENARCHE

The average age at the onset of menarche for U.S. women has remained relatively stable for the past 30 to 40 years. The median age for the first menstrual cycle is 12.4 years (Chumlea et al., 2003). Menarche is delayed in highly athletic girls, yet it is still unclear whether sports participation causes delayed menarche, or if there are more late-maturing girls participating

in competitive sports, particularly sports that favor leanness and a pre-pubescent physique (e.g., gymnastics, figure skating).

Studies over the past two decades consistently show that athletes with delayed menarche report higher rates of menstrual dysfunction (Cobb et al., 2003; Drinkwater et al., 1984). Lower levels of circulating estrogen in athletes with menstrual dysfunction compromise bone mineral accrual during critical adolescent years, when over 90% of adult peak bone mass is gained. Thus, delayed menarche may increase the risk of osteoporosis in later years. [See subsequent sections in this chapter on amenorrhea and bone health.]

In contrast, early pubertal development in girls, as measured by the onset of menarche or secondary sexual characteristics, is associated with increased frequency of smoking and drinking (Dick, Rose, Pulkkinen, & Kaprio, 2001), greater likelihood of exhibiting symptoms of anxiety and depression (Hayward et al., 1997), increased body dissatisfaction and drive for thinness (Striegel-Moore et al., 2001), and increased bulimia-type eating behaviors and bulimia nervosa (Hayward et al., 1997; Kaltiala-Heino, Rimpela, Rissanen, & Rantanen, 2001). Therefore, the timing of menarche is associated with a number of physiological and psychological factors, all of which may be influenced—positively or negatively—by physical activity.

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BONE HEALTH

In the past decade, research has confirmed that childhood and adolescence are the most important stages of life for enhancing bone strength through exercise and diet in order to reduce osteoporosis risk later in life. Bone strength is a function of bone mineral mass/density (BMD) and bone quality (e.g., size, shape, thickness of the cortex). Although bone strength is largely determined by genetic and hormonal factors, physical activity and diet play important roles in bone health. Adequate energy intake, as well as calcium and vitamin D, are particularly important during childhood and adolescence when bone mineral accrues at an accelerated rate. Accumulating evidence indicates a sedentary lifestyle typical of industrialized societies may be detrimental to the bone health of individuals at any age. The Iowa Bone Development Study reported that elementary school children in the lowest one-third (<30 minutes/day) of vigorous physical activity had significantly lower bone strength than children in the highest one-third (>42 minutes/day) after controlling for age, height, and weight (Janz et al., 2004).

The benefits of exercise on bone are well documented but not fully understood. The effects of exercise are site-specific—that is, bone responds to impact or muscular tension at the site(s) that are stimulated. For example, jumping loads the hips and bones in the legs, but will not activate bone development of the arms. Ground reaction forces induced by high-



impact sports, as well as joint reaction forces induced by high intensity resistance/weight training increase BMD at the sites activated. In a recent study comparing different types of impact sports, Finnish female athletes participating in sports associated with high impact (volleyball, hurdling) or multi-directional impact (soccer, squash) had stronger femoral neck structural properties compared to athletes participating in repetitive lower impact loading sports (orienteeing, cross-country skiing) (Nikander, Sievanen, Heinonen, & Kannus, 2005). The type of loading predicted 13% of the variance in measures of hip structure and bone strength. Studies like the one by Nikander et al. (2005) which include measures of bone geometry in addition to BMD, are providing new evidence showing that the specific type of mechanical loading is a strong behavioral determinant of bone structure and therefore bone strength, which in turn acts as a protective factor against osteoporosis in adulthood.

The adolescent years provide a window of opportunity to accrue bone, which in theory may reduce fracture risk later in life. Fostering bone health in childhood is of critical importance, as the rate of bone development is at its peak during late childhood and early adolescence. Between the ages of 11 and 14 years, girls accrue bone mineral at their fastest rate, and by age 17 they will have gained over 90% of their peak bone mass (Bailey, Martin, McKay, Whiting, & Mirwald, 2000; Weaver, 2002). Attaining a high peak bone mass is clinically very important, as the risk of osteoporosis and fracture increases dramatically in individuals with low peak bone mass values (Heaney et al., 2000; Davies, Evans, & Gregory, 2005).

Over the past five years research has illuminated the positive effect of impact exercise on bone mass during childhood and adolescence. Specific jumping exercises performed three days a week for 20 to 30 minutes/session for seven months resulted in greater gains in bone mineral content of the lumbar spine and hip in 6- to 10-year-old girls compared to children performing stretching exercises (Fuchs, Baue, & Snow, 2001). In an eight-month school-based physical education program, 8- to 12-year-old girls gained more bone at the spine and hip with just 10 minutes/day, 3 days/week of jumping, running, and other bone-building activities, compared to girls in traditional physical education classes (MacKelvie, Khan, Petit, Janssen, & McKay, 2003). Results demonstrate the important and meaningful gains in bone mass that can occur with the addition of *as little as 10 minutes/day* of bone-loading activities of a non-athletic nature—physical activities that are potentially sustainable for most children, and which can be performed safely in most environments with little or no special equipment.

In addition to impact exercise, calcium intake plays an essential role in bone mineralization during childhood and adolescence. The Institute of Medicine (IOM) recommends 1300 mg calcium/day to promote maximal calcium retention for children aged 9 to 13 years (Food and Nutrition Board, Institute of Medicine, 1997). However, 71% of girls 6 to 11 years of age and 88% of females 12 to 19 years of age do not get 100% of the daily

Fostering bone health in childhood is of critical importance.

calcium requirement defined by the Adequate Intake (AI) (Alaimo, McDowell, & Briefel, 1994). Thus, approximately 8 out of 10 girls and teens are not consuming sufficient calcium to protect them from the onset and risk of osteoporosis in adulthood.

CARDIOVASCULAR HEALTH

Traditional cardiovascular risk factors include high cholesterol, high blood pressure, smoking, and physical inactivity. In adults, higher levels of cardiorespiratory fitness can moderate the deleterious effects of family history of coronary heart disease (CHD), high blood glucose, overweight and obesity, and the presence of established CHD risk factors on morbidity and mortality risks (Blair et al., 1995; Blair et al., 1996). In the 1999–2002 NHANES study, “high fit” girls had significantly lower levels of overweight and/or obesity, waist circumference, systolic blood pressure, total cholesterol, and hemoglobin A_{1c} compared to the “low fit” girls (Carnethon, Gulati, & Greenland, 2005). Adolescent girls with low aerobic fitness levels were at a two-fold higher risk of being overweight and/or obese and having high serum cholesterol than higher fit girls. In the Quebec family study, girls classified as “high fit and low fat” had significantly better blood pressure and blood glucose levels than girls classified as “low fit and high fat” (Eisenmann et al., 2005). These studies indicate that girls with low cardiovascular fitness and high body fatness are at increased risk for developing CHD in adulthood.

In the U.S. National Longitudinal Study of Adolescent Health, changes in the prevalence of physical activity, body weight, and correlates of sedentary behaviors from adolescence into adulthood were examined (Gordon-Larson, Nelson, & Popkin, 2004). Among the girls, only 2.7% engaged in moderate to vigorous activity five or more times/week in adolescence and in adulthood, whereas 70.7% were inactive at both periods. Among girls ages 11 to 21 years who were active in adolescence, 24.4% ceased to be physically active in adulthood. Compared with non-Hispanic White girls, non-Hispanic Black girls were three times more likely to be inactive in adolescence and in adulthood. Data within this nationally representative study reflect the physical activity habits of over 20 million young adults in the U.S. and highlight the concern for the increased risks for chronic disease and disability for girls—especially girls of color who tend to have higher rates of inactivity—as they reach adulthood due to high levels of physical inactivity reported during adolescence.

BODY WEIGHT

There is growing concern about the progressive increase in overweight and/or obesity among adolescent girls in the U.S. over the past two decades. According to the U.S. Centers for Disease Control and Prevention (CDC, 2000) adolescents who are at risk for

Girls with low cardiovascular fitness and high body fatness are at increased risk for developing CHD in adulthood.



overweight have a BMI within the 85th–95th percentile for their sex and age categories and adolescents who are overweight and/or obese have a BMI > 95th percentile for their sex and age categories. According to the 2003–2004 National Health and Nutrition Examination Surveys (NHANES) (2007), there has been a gradual increase in the proportion of girls age 12 to 19 years who are at risk for overweight from previous years, with nearly half classified as overweight and/or obese. Non-Hispanic Blacks and Mexican American girls are 50% more likely to be overweight and/or obese than non-Hispanic Whites, placing them at a higher risk for inactivity and/or obesity-related conditions as they age. Adolescence continues to be a period of increasing body weight for girls, which can begin in girls as young as six years old. Between age 6 and 11 years, girls are 53% more likely to be overweight compared with girls age 2 to 5 years (Ogden, Carroll, Curtin et al., 2006). Thus, regular physical activity programs are needed for young girls in order to prevent the risks associated with overweight as girls mature into adolescence.

The correlates of physical inactivity and overweight status in young adults also have been recently examined (National Institute of Child Health & Human Development, 2007; Gordon-Larsen, Adair, & Popkin, 2002). Girls spent an average of 18.7 hours per week watching television and playing video games. The odds of being overweight are nearly double for girls who watch more than 35 hours of television and videos per week compared to girls who watch less television and videos. Girls who engage in moderate to vigorous activity at least five times/week are less likely to be overweight than less active girls.

These data highlight the increasing trend toward increased overweight and/or obesity among young and adolescent girls in the U.S. and the association between sedentary behaviors, race and ethnicity, and overweight status. Regular moderate to vigorous physical activity is protective against overweight status and should be promoted through school and out-of-school programs designed to increase the daily physical activity of girls.

POTENTIAL DELETERIOUS EFFECTS OF PHYSICAL ACTIVITY

As outlined in Chapter 1, interscholastic sports participation for girls has markedly increased over the last three decades. Many benefits of increased sports participation are evident; however, increased pressure from coaches, parents, and/or peers outlined in Chapter 2 may lead to the practice of unhealthy behaviors in an attempt to improve performance, the most prevalent of which are summarized in the following section.

The Female Athlete Triad Syndrome

A decade ago, the female athlete triad was first recognized and reported as a syndrome of three interrelated and serious health disorders—disordered eating, amenorrhea, and

Girls spent an average of 18.7 hours per week watching television and playing video games.

osteoporosis (Otis, Drinkwater, Johnson, Loucks, & Wilmore, 1997). Recent research pertaining to each of the three components of the Triad is discussed below.

DISORDERED EATING/EATING DISORDERS (DE/ED)

Eating disorders, including anorexia nervosa, bulimia nervosa, and binge eating disorder, are serious clinical conditions that may result from persistent preoccupation with thinness, dieting, and/or concern with body weight or shape. Disordered eating attitudes may lead to pathogenic behaviors, including vomiting, binging/purging, use of diuretics, diet pills, or laxatives, and/or excessive exercise to control body weight. Among female collegiate and elite athletes, the reported prevalence estimates of DE/ED range from 15–62%, whereas in the general adolescent female population approximately 13–20% have reported disordered eating attitudes regarding body weight and shape concern (Carter, Stewart, & Fairburn, 2001). Among high school athletes, a recent publication showed 18% reported dietary restraint or other disordered eating attitudes or behaviors (Nichols, Rauh, Lawson, Ji, & Barkai, 2006). The implications of this report are alarming, as restricting caloric intake during the adolescent years may lead to reductions in peak bone mass and increased risk of osteoporosis later in life.

Research confirms an imbalance between energy intake and energy expenditure may induce menstrual dysfunction.

MENSTRUAL DYSFUNCTION

Menstrual dysfunction (MD) includes primary amenorrhea (no onset of menses by age 15), secondary amenorrhea (absence of three or more consecutive cycles or fewer than 10 cycles in the past year), or oligomenorrhea (menstrual cycles occurring at intervals less than 21 or more than 35 days, after onset of menses by age 15) (American Academy of Pediatrics Committee on Sports Medicine and Fitness, 2000). Menstrual dysfunction varies in severity and involves hormone alterations and various menstrual phase disturbances; however, any menstrual disturbance that is sustained for more than 3–6 months may be potentially dangerous to an individual’s bone and reproductive health, and therefore should be evaluated by a clinician (American Academy of Pediatrics Committee on Adolescence, 2006).

Menstrual dysfunction is reported more often in elite athletes than in recreational athletes or non-athletes, and is more frequently reported by athletes in sports that favor leanness, such as gymnastics and distance running (Beals & Hill, 2006; Torstveit & Sundgot-Borgen, 2005). In addition to sport type, the intensity and duration of activity, nutrient intake, and age at menarche are associated with the prevalence and severity of menstrual irregularity. Historically, low body fatness was thought to cause amenorrhea in athletes. However, recent research confirms an imbalance between energy intake and energy expenditure may induce menstrual dysfunction (Ihle & Loucks, 2004; Loucks, 2003).



A number of studies have demonstrated that the benefits on bone conferred by sports participation may be negated in young athletes with menstrual dysfunction (Drinkwater, Bruemmer, & Chesnut, 1990; Pettersson, Stalnacke, Ahlenius, Henriksson-Larsen, & Lorentzen, 1999; Torsteveit & Sundgot-Borgen, 2005). Moreover, bone loss or suboptimal bone mineral accrual associated with amenorrhea may not be completely reversible with the resumption of menses (Keen & Drinkwater, 1997). Thus, adolescents with menstrual dysfunction may miss a key developmental period relative to maximizing their bone mineralization.

LOW BONE MASS

The association between amenorrhea and low bone mass in athletes was first reported by Drinkwater et al. in 1984. Since that time similar research utilizing elite and collegiate athletes has confirmed the seminal findings, but surprisingly little is currently known regarding the prevalence of low bone mass in athletes high school age or younger. Using the International Society for Clinical Densitometry (ISCD) criteria, a recent study of female high school athletes showed that while only 4% had bone mineral density (BMD) values lower than the expected range for their age, nearly 22% of the athletes may not be accruing bone mineral at the expected rate for their age (Nichols et al., 2006). Furthermore, athletes who reported oligo/amenorrhea had significantly lower BMD at the trochanter (and a trend toward lower total hip BMD) compared to normally menstruating athletes.

The physiologic pathway leading to the Triad was previously described as disordered eating behaviors-induced amenorrhea, which in turn led to reduced BMD. However, current evidence indicates that insufficient energy availability relative to energy expenditure may have profound and rapid detrimental effects on bone health (Ihle & Loucks, 2004). If young female athletes restrict calories during the critical years of rapid bone mineral deposition, the ability to attain a high peak bone mass may be compromised, despite the otherwise beneficial effects of sport participation.

Chronic Disease Prevention

During adolescence, the adoption and maintenance of healthful behaviors is critical for prevention of chronic diseases in adulthood. Behaviors associated with the Female Athlete Triad profile of disordered eating, amenorrhea, and osteoporosis predispose girls to an early onset of osteoporosis. Low levels of physical activity and aerobic fitness, overweight and obesity, and sedentary lifestyle behaviors promote the early development of cardiovascular and metabolic diseases associated with morbidity and early mortality among U.S. adults. Osteoporosis and Type 2 diabetes are two of the primary deleterious health conditions

During adolescence, the adoption and maintenance of healthful behaviors is critical for prevention of chronic diseases in adulthood.

that can be avoided by maintaining an active lifestyle in accordance with recommended guidelines for regular physical activity and healthful eating.

OSTEOPOROSIS

Once thought of as a disease restricted to the frail elderly, osteoporosis is currently viewed by many as a pediatric disease that manifests itself in old age (Bailey & McCulloch, 1992). Given that greater than 90% of peak bone mass in women is accrued by age 19 and low peak BMD is associated with increased fracture risk, childhood and adolescence are critical years for prevention of this disabling and costly disease. In addition to the influence on BMD of estrogen and bone-loading physical activity, adequate energy intake and adequate calcium and vitamin D are essential for bone health of girls and young women. Given that most children and adolescents do not get adequate impact exercise and do not consume adequate calcium, coupled with the fact that life expectancy has increased steadily since the early 1900s, it is not surprising that the present generation of youth is projected to be diagnosed with osteoporosis as adults at an alarming rate.

Osteoporosis is currently viewed by many as a pediatric disease that manifests itself in old age.

TYPE 2 DIABETES

Long considered a chronic disease that only affected adult populations, the prevalence of Type 2 diabetes mellitus (T2DM) in children is rising dramatically, and is labeled as an “epidemic” by some scholars (Fagot-Campagna, Burrows, & Williamson, 1999; Aye & Levitsky, 2003). Before the 1990s, only 1 to 2% of children were diagnosed with T2DM. However, by the mid-1990s, T2DM represented 8 to 45% of all new diabetes cases reported in children and adolescents (American Diabetes Association, 2000), and is disproportionately represented in minority populations (Dabelea, Pettitt, Jones, & Arslanian, 1999; Rosenbloom, Joe, Young, & Winter, 1999).

The recent increase of T2DM in children and adolescents is closely linked with the rising prevalence of obesity (Dietz, 1998; Goran et al., 1995; Kimm et al., 2000; Troiano & Flegal, 1998). As mentioned previously, there is an increasing trend of overweight and/or obesity among girls (Odgen, Flegal, Carroll, & Johnson, 2002). Similar to the cause in adult populations, it is suggested that children become overweight due to an interaction between genetic and environmental factors (i.e., poor diet, physical activity practices, or lack thereof) (Kimm et al., 2000). Overweight children and adolescents are at higher risk to develop metabolic risk factors that are specific to the development of T2DM, such as high blood insulin levels and decreased insulin sensitivity, when compared to children of normal weight. Therefore, it is not surprising that 85% of children who have T2DM were either overweight and/or obese at diagnosis (Aye & Levitsky 2003).



Regular physical activity is a major modifiable risk factor for the prevention of T2DM, as physical activity improves insulin sensitivity, lowers blood glucose, and is important in the long-term maintenance of a healthy body weight (Franz et al., 2002). When compared to adults, there is far less research that delves into the role of children's physical activity on obesity and metabolic risk factors that are related to T2DM development; however, data suggests that children and adolescents similarly benefit by engaging in and maintaining regular levels of physical activity (Goran, Ball, & Cruz, 2003).

Girls may have greater risk for obesity and T2DM because they tend to be less active than their male counterparts (U.S. DHHS, 1996a; Sallis, Prochaska, & Taylor, 2000). To date, few studies have specifically targeted girls when examining the role of physical activity on T2DM-related risk factors. In one small clinical trial, obese African American girls were randomized to either an aerobic training or lifestyle education (control) group to determine the best approach for metabolic risk factor reduction. Although neither group improved metabolic risk factors (Gutin, Cucuzzo, Islam, Smith, & Stachura, 1996), the aerobic training group improved body composition when compared to girls in the control group (Gutin et al., 1995). In contrast, findings from a 2005 investigation suggested that higher aerobic fitness and a lower percent body fat were associated with lower fasting glucose and insulin concentrations (Kasa-Vebu, Lee, Rosentahl, Singer, & Halter, 2005). Although limited, these preliminary findings highlight the importance of maintaining regular moderate to vigorous physical activity to reduce risk of obesity and associated T2DM development in girls and adolescents.

Girls may have greater risk for obesity and T2DM because they tend to be less active than their male counterparts.

Summary and Implications

Conclusive evidence indicates that physical activity, physical fitness, and sport contribute greatly to the health and well-being of girls at any age. In addition to positive physiological adaptations conferred by active lifestyles, benefits also include those associated with sociological and psychological well-being outlined in Chapters 2 and 3. A summary of the physiological contributions of physical activity, fitness, and sport is presented below.

Regular participation in vigorous physical activity can improve heart function, aerobic power, cardiovascular endurance, and hence, sports performance. Multiple cardiorespiratory and metabolic adaptations also occur in response to moderate intensity physical activity performed at least five days per week for 60 minutes per session. These include more favorable blood lipid, glucose, and insulin profiles, and lower blood pressure, all of which reduce girls' risk for development of chronic diseases such as cardiovascular-related disease and Type 2 diabetes. The increased caloric expenditure associated with regular aerobic exercise is both beneficial and necessary to prevent obesity and its related health disorders.

Participation in muscle strengthening exercise is safe and beneficial for girls and women. However, strength exercises do not have to be performed on traditional resistance machines. Resistance exercises can be incorporated into a program that includes use of a girl's own body weight as resistance, for example, push-ups and pull-ups, fitness games, and circuits that combine aerobic activities with muscular strength and motor skill activities. For those facilities that have child-sized weight machines, or adult machines that can be modified for children, The American Academy of Pediatrics Committee on Sports Medicine and Fitness (2001) recommends 1 to 2 days/week of moderate intensity strength exercises for which one set of 13 to 15 repetitions are performed under careful adult supervision.

Childhood and early adolescence provides a window of opportunity for girls to maximize bone mineralization. Although the specific exercise prescription that best builds bone is not yet known, a number of studies have shown that high impact activities performed a few minutes/day, three days/week, can enhance bone mineral density in pre- and post-pubertal girls. Fitness activities that provide high impact and variable/odd loading to bones should be incorporated into physical activity programs for girls. Some examples include jumping rope, playing hopscotch and similar activities, obstacle courses, and rebounding activities.

Finally, health and fitness professionals must be aware of the risks and signs of overtraining, especially as it relates to athletic amenorrhea and injuries. Adequate energy intake relative to energy expenditure is critical to preventing amenorrhea and the risk of premature bone loss. More recent studies also indicate that insufficient energy availability during adolescence might also negatively impact the rate of bone mineral accrual, which could then lead to lower peak bone mass in young adulthood. Coaches, parents, and health care professionals need to teach and encourage girls to practice healthy dietary behaviors related to bone health, as well as engage in and maintain adequate physical activity in order to control body weight and reduce the development of chronic disease risk factors that can accrue as a result of poor nutrition alone—and in combination with—physical inactivity.

CHAPTER 5

Girls' Physical Activity Participation: **Recommendations for Best Practices, Programs, Policies, and Future Research**

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WHY IS PHYSICAL ACTIVITY GOOD FOR GIRLS? BASED ON WHAT OUR expert scholars have reported, physical activity is essential for girls because it benefits their physical, psychological, and social health. It is essential because it is a vehicle through which efficient motor skills and positive life skills can be developed. It is essential because it is part of a fun, complete, and balanced life. Physical activity is not an “add-on,” but rather is a core value and principle for healthy and effective living. Physical activity plays a central role in obesity prevention through reducing physical activity attrition rates by constructing, offering, evaluating, and refining top quality opportunities and programs—developed based on principles that can be derived from academic scholarship and the tacit experiences and knowledge of outstanding physical activity professionals.

Girls participate in physical activity to develop themselves—physically, socially, psychologically—and with the right opportunities and minimal barriers will become and stay physically active if they feel the benefits of development outweigh the costs of engaging. But so far we have not done an effective job of using our knowledge of the benefits to keep the maximum number of girls active and healthy. Based on the National Youth Risk Behavior Survey (CDC, 2005), adolescent girls are significantly less likely than boys to have recently participated in moderate-to-vigorous physical activity (MVPA), met currently recommended levels of physical activity, or attended physical education classes. At the same time, girls are significantly more likely to have gone without eating for more than 24 hours, and in the previous month to have vomited or taken diet pills, powders, liquids, or laxatives, all in order to lose or avoid gaining weight (CDC, 2005). Whether we like it or not, at present girls are concerned about their physical appearance. While working toward levels of societal changes

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that will deemphasize appearance and instead claim preeminent focus on both healthy living and the acceptance of a multitude of body types as normal and attractive, we must continue to help girls realize that increasing levels of physical activity participation can not only help them enjoy the many associated motor and health benefits and developmental assets, but can also give them confidence in the physicality of their bodies both in terms of how they perform and in terms of how they are viewed.

Throughout this report we have directed our efforts toward using our knowledge base to find ways of increasing girls' participation in physical activity. Physical activity is "any activity that causes your body to work harder than normal" (Medline Plus Medical Encyclopedia, 2007), encompassing bodily movement produced through skeletal muscle contraction and requiring substantial increases in energy expenditure (U.S. DHHS, 1996a). As discussed in this report, physical activity occurs in a wide variety of contexts and achieves a wide variety of outcomes, as represented in Figure 1. We strongly support approaches that utilize all of these sources in generating a balanced profile of physical activity life experiences which, taken in sum, provide girls with many and complementary avenues for successful and healthy living. From a motivational standpoint, most individuals are motivated for achievement by having choice, control, a sense of belongingness, and competence, and so "achievement" in developing motor skill competence and physical activity engagement results from having such diverse and complementary programming opportunities combined with effective evidence-based program design and leadership. Optimal opportunities and structure lead to positive psychological, social, and physical wellness outcomes.

With the evidence-based research findings of the previous chapters in mind, the purposes of this chapter are to provide practitioners with examples of exemplar approaches and programs, recommendations for best practices and policies, and suggestions for future research so that they might maximize girls' health, development, and well-being through their own well-constructed physical activity opportunities. We first consider best practices.

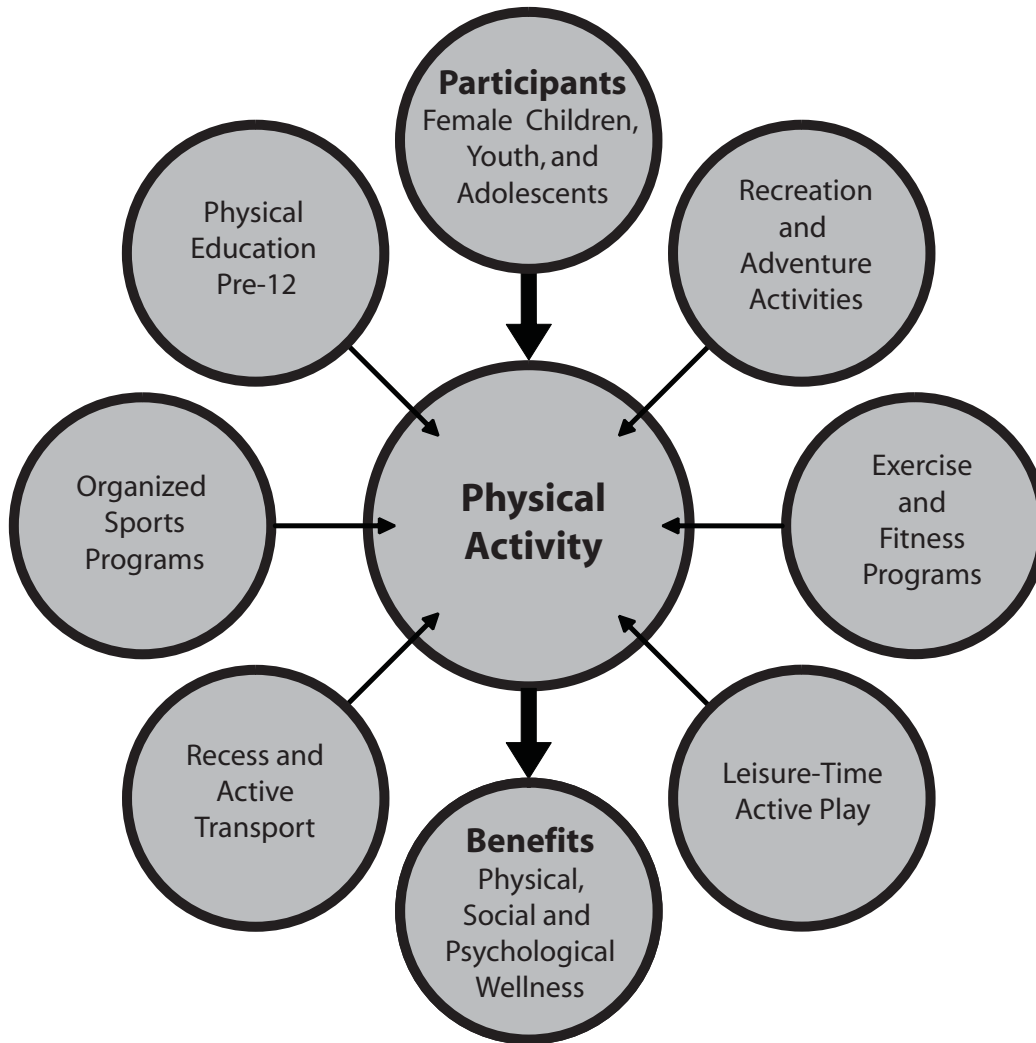
Best Practices

Our previous chapter authors have surveyed research on girls and physical activity in their areas of expertise, and have arrived at many specific guidelines that can be used to develop and structure practitioners' own offerings around evidence-based guidelines. Many of the same elements are inherent in diverse physical activity settings, such as the importance of effective and caring leaders, optimally challenging movement opportunities, and diverse activity experiences.

Optimal opportunities and structure lead to positive psychological, social, and physical wellness outcomes.



Figure 1. *In-school and out-of-school time physical activity opportunities and benefits for girls*



These “best practices” represent strategies that should be used to develop optimum movement skill, physical activity, and associated health outcomes in girls. Table 1 summarizes strategies related to psychosocial factors influencing girls’ participation and persistence in physical activity, while Table 2 shows strategies utilizing an understanding of sociocultural influences on physical activity to achieve desired outcomes. Table 3 identifies specific strategies derived from the chapter on physiologic and metabolic benefits for girls. All three tables illustrate approaches that emphasize engaging, increasing, and maintaining physical activity participation among girls for the associated physical, psychological, and social benefits.

Table 1. *Psychosocial Best Practices for Optimal Physical Activity and Health Outcomes in Girls (derived from Chapter 2)*

PHYSICAL ACTIVITY AND HEALTH OUTCOMES	PSYCHOSOCIAL BEST PRACTICES FOR GIRLS
Supportive Parent- and Family-Created Climate	<ul style="list-style-type: none"> • Emphasize intrinsic motives such as learning and enjoyment for physical activity engagement of girls • Show belief in girls' physical activity and sport competence • Encourage mothers and fathers to equally take both active and supportive roles in daughters' sport and physical activity involvement • Value physical activity and believe it important for girls • Model physically active lifestyles
Supportive Coach-Created Climate	<ul style="list-style-type: none"> • Allow athletes to participate in decision-making • Develop warm interpersonal relationships with athletes • Establish a positive group atmosphere • Create a task-involving climate • Use positive, encouraging, and instructive feedback • Provide good technical instruction
Supportive Physical Education Teacher-Created Climate	<ul style="list-style-type: none"> • Create task- and mastery-oriented environments focused on learning, effort, and improvement • Use positive, contingent, supportive information feedback combined with minimal punitive feedback • Provide a broad range of curricular offerings, such as aerobics, self-defense, and weight training in addition to competitive sports and other traditional physical education activities
Supportive Peer Climate	<ul style="list-style-type: none"> • Encourage girls to associate with other physically active girls who support their efforts • Develop sport friendships that provide opportunities for shared interests, emotional support, loyalty, and intimacy • Share a task-involving climate that emphasizes improvement, effort, and relationships • Allow opportunities for peer-assisted learning among girls • Watch friends participate and compete
Talent Development	<ul style="list-style-type: none"> • Engage in "deliberate practice" • Expect intense commitment and preparation • Provide opportunities for mental and physical rest • Develop intrinsic motivation and desire to develop talent • Emphasize behavioral choice by frequently practicing motor and sport skills outside of organized practices • View talent from a developing system point of view • Establish broad-based physical activity participation in the early years
Values, Interest, and Importance of Physical Activity	<ul style="list-style-type: none"> • Help girls get and stay interested in physical activity • Help girls value physical activity and health improvement • Help girls reduce the barriers to and maximize the benefits of physical activity participation



Table 1, continued. *Psychosocial Best Practices for Optimal Physical Activity and Health Outcomes in Girls*

PHYSICAL ACTIVITY AND HEALTH OUTCOMES	PSYCHOSOCIAL BEST PRACTICES FOR GIRLS
Motivation for Physical Activity	<ul style="list-style-type: none"> • Recognize that girls play sport for reasons of physical competence, social acceptance, and enjoyment • Cultivate the intrinsic motivation for physical activity (PA) typical of early childhood years • Know achievement motivation is ideally task-involved, in which perceptions of PA competence are self-referenced with respect to performance and effort
Self-Perceptions about Physical Selves	<ul style="list-style-type: none"> • Develop physical activity competence and physical fitness and girls' self-perceptions improve • Use adult and peer comments that reinforce, rather than denigrate, girls' physical competence • Establish healthy and active females as models for overall health and well-being, and strong and healthy physiques
Mature Moral Development	<ul style="list-style-type: none"> • Maintain girls' parallel reasoning strengths in using similar processes to reason about moral situations in both sport and life, holding high standards for both • Talk about, demonstrate, and distinguish between "good" and "bad" aggression • Use teachable moments and conflict situations to help girls develop and mature their moral reasoning capacities
Enjoyment of Physical Activity	<ul style="list-style-type: none"> • Provide psychological elements that girls find enjoyable, such as optimal challenges, social connection, intrinsic pleasure in activity, mastery-focused climates, skill development, and positive affect from important adults • Establish a task-oriented climate in structured activities • Allow unstructured, free play, free choice recess, and after-school opportunities for girls to be active
Stress Management	<ul style="list-style-type: none"> • Minimize stress-producing social influences, such as parental pressure, ego-oriented climates, punitive approaches to discipline, and authoritarian and autocratic leadership • Develop coping and social resources among girls, such as relaxation training and social ties
Mental Health	<ul style="list-style-type: none"> • Use exercise as an adjunct to other forms of treatment and intervention in managing psychiatric and mental health conditions such as depression and anxiety
Optimal Cognitive Functioning	<ul style="list-style-type: none"> • Encourage schools to maintain opportunities for girls to be physically active during the school day through physical education classes, recesses, and active learning opportunities within curricular areas, as physical activity and fitness are related to optimal cognitive functioning and academic performance

Table 2. *Sociocultural Best Practices for Optimal Physical Activity and Health Outcomes in Girls (derived from Chapter 3)*

PHYSICAL ACTIVITY AND HEALTH OUTCOMES	SOCIOCULTURAL BEST PRACTICES FOR GIRLS
Positive Gender Construction	<ul style="list-style-type: none"> • Support gender-equal practices • Establish girls and boys as equals in physical activity skill and participation and not as binary “opposites” • Challenge male privilege in sport and physical activity • Engage a model of girls’ strength rather than deficit
Girl-Friendly Physical Activity Curriculum	<ul style="list-style-type: none"> • Let girls’ preferences guide selection of movement activities • Maximize early and frequent exposure to non-threatening physical activity learning experiences in which girls can acquire the skills necessary to engage successfully in sport (i.e., develop competence) • Provide a broad range of early movement experiences (e.g., fundamental motor skills such as throwing, kicking, catching, and striking) so girls gain a strong movement base for later, more complex, physical pursuits • Include lifetime leisure pursuit physical activities • Include competitive and cooperative physical activities and approaches • Include longer curricular units to allow more time for skill development
Positive and Healthy Body Image	<ul style="list-style-type: none"> • Construct physical education, exercise, and other physical activity settings in ways that limit or prevent the surveillance and sexualization of girls’ bodies • Encourage and teach girls to treat overweight classmates with respect and care • Empower girls to actively and assertively breach limits of femininity by helping girls learn, practice, and engage in all types of activities, movements, and styles of play • Teach girls to value what their bodies can “do” rather than “how they look” • Discuss key issues about girls’ experience of their bodies, such as how girls who exercise and play sport feel about themselves, and how girls who play sports are represented in popular culture
Effective Instructional Methods for Motivating, Teaching, and Evaluating	<ul style="list-style-type: none"> • Use equitable practices that advantage girls and not those that disadvantage them or reinforce their perceived “inferiority” in physical activity • Individualize learning with associated rewards for improvement and effort in addition to ability, similar to other academic curricular areas (such as assignment and completion of movement “homework” as in other subjects) • Motivate girls by emphasizing sports’ intrinsic (e.g., fun, pleasure, challenge) rather than extrinsic (e.g., winning, proving superiority to others) rewards • Create a safe, accepting environment for girls to explore their movement abilities whatever they may be
Physical Activity Leaders who Eliminate Gender Stereotypes	<ul style="list-style-type: none"> • Provide cross-gender leadership models (e.g., both males and females as physical activity leaders; males instruct dance and females instruct football) • Identify skilled athletic models for girls • Create a climate respectful of diversity in gender, race, ethnicity, culture, ability, and sexual orientation • Promote care and concern among classmates for all participants • Make all sport and physical activities “gender-neutral” (e.g., contact sports and expressive movement activities acceptable for both boys and girls) • Advocate for equal programs, resources, and publicity for girls and boys in school- and community-based athletic programs



Table 2, continued. *Sociocultural Best Practices for Optimal Physical Activity and Health Outcomes in Girls*

PHYSICAL ACTIVITY AND HEALTH OUTCOMES	SOCIOCULTURAL BEST PRACTICES FOR GIRLS
Critical Literacy	<ul style="list-style-type: none"> • Recognize and resist society’s messages about ideal beauty • Resist and challenge the notion that self-worth is linked to physical attractiveness • Be critical of sexualized and marginalized images of female athletes • Understand the profit-driven purposes of the beauty/fashion/diet industries • Challenge inequitable educational practices • View obesity and overweight as an individual and societal problem
Social Benefits	<ul style="list-style-type: none"> • Offer girls opportunity for camaraderie, cooperation, leadership • Help girls gain social capital and social ties • Emphasize that strong and active girls overcome stereotypical social constructions of femininity (such as weak, fragile, helpless or limited) • Help reduce obesity and the social stigma that entails through physically active lifestyles

Table 3. *Physiological and Metabolic Best Practices for Optimal Physical Activity and Health Outcomes in Girls (derived from Chapter 4)*

PHYSICAL ACTIVITY AND HEALTH OUTCOMES	PHYSIOLOGICAL AND METABOLIC BEST PRACTICES FOR GIRLS
Cardiorespiratory Fitness	<ul style="list-style-type: none"> • Frequency of 3 to 5 days/week • Intensity of Vigorous Nature (70% max HR or more) • Time/Duration of 15 to 45 minutes/session
Muscular Strength and Endurance	<ul style="list-style-type: none"> • Resistance training of one set of 13 to 15 repetitions per exercise • 2 to 3 times/week of moderate intensity training • Equipment suited to child’s size and physical development
Bone Health	<ul style="list-style-type: none"> • Variety of loading and weight-bearing activities • Include some high-impact activities to stress bone optimally • Duration as little as 10 minutes/day, 3 days/week
Balanced Nutrition	<ul style="list-style-type: none"> • Overall balanced, healthy dietary behaviors • 1300 mg of calcium daily • 8 mg of iron daily for girls, 9-13 years; 15 mg/daily for girls 14-18 years
Cardiovascular Health	<ul style="list-style-type: none"> • Regular Moderate-to-Vigorous Physical Activity (MVPA) important for reducing chronic disease consequences MVPA defined as (quoted directly from CDC, 2007a): Moderate-intensity physical activity refers to a level of effort in which a person should experience: <ul style="list-style-type: none"> • some increase in breathing or heart rate • a “perceived exertion” of 11 to 14 on the Borg scale (the effort a healthy individual might expend while walking briskly, mowing the lawn, dancing, swimming, or bicycling on level terrain, for example). • 3 to 6 metabolic equivalents (METs); or • any activity that burns 3.5 to 7 Calories per minute (kcal/min) • Vigorous-intensity Physical Activity may be intense enough to represent a substantial challenge to an individual and refers to a level of effort in which a person should experience: <ul style="list-style-type: none"> • large increase in breathing or heart rate (conversation is difficult or “broken”) • a “perceived exertion” of 15 or greater on the Borg scale; (the effort a healthy individual might expend while jogging, mowing the lawn with a nonmotorized pushmower, participating in high-impact aerobic dancing, swimming continuous laps, or bicycling uphill, carrying more than 25 lbs. up a flight of stairs, standing or walking with more than 50 lbs., for example). • greater than 6 metabolic equivalents (METs); or • any activity that burns more than 7 kcal/ min
Body Composition and Health	<ul style="list-style-type: none"> • Commit to regular MVPA • Reduce sedentary behaviors (such as television viewing) • Maintain healthy body weight and body mass index (BMI) as recommended for age
Menstrual Function	<ul style="list-style-type: none"> • Maintain balance between energy intake and energy expenditure for optimal menstrual function
Optimal Training Intensity	<ul style="list-style-type: none"> • Engage in cross training, variety, and multiple sources of physical activity • Avoid undertraining and associated health risks of sedentary and inactive life styles • Avoid overtraining and associated health risks of injury, female athlete triad



In a broader sense, however, not only can optimum physical activity participation be a desirable outcome of best practices in and of itself, but the reciprocal paths of influence are equally important and beneficial, i.e., that physical activity engagement, learning, and performance is not only achieved via effective practices but that best practices in physical activity opportunities also have the potential to be a salient and attractive forum for developing other life skills among female participants. Life skills and their associated programs are approaches which have been used to help athletes develop broad bases of skills necessary not only for sport participation but that are transferable to broader life situations as well, and are skills which provide both facilitative and protective effects. A positive youth development approach to life skills would lead us to focus on how physical activity participation can help children and youth strengthen their repertoire of key lifetime assets such as competence, usefulness, belonging, and empowerment. In addition to the accrued gains in motor competency and sport skill, sport participation can also be used to promote social, emotional, cognitive, behavioral, physical, and moral competences; foster resilience, self-efficacy, and identity; and develop connection and civic engagement in ways that extend far beyond the physical activity engagement context.

Experiences and qualities central to life skills and positive youth development include building specific constellations of assets—such as social, psychological, intellectual, and physical—all of which can potentially be garnered through properly structured and supervised physical activity opportunities and climates. Positive assets are gained via the social climate and social institutions (e.g., connectedness, support, empowerment, boundaries, and constructive use of time), psychological and emotional assets are generated through positive experiences (e.g., spirituality, emotional regulation, commitment to learning, positive values, social competencies, and positive identity), intellectual assets accrued via learning opportunities (e.g., critical thinking and reasoning, decision-making, academic success), and physical assets developed through physical activity and education (e.g., good health habits, risk management) (Minnesota Commission on Out-of-School Time, 2005; National Research Council & Institute of Medicine [NRCIM], 2004; Search Institute, 2005). Having more positive assets is associated with more positive and successful youth development (Durlak & Weissberg, 2007; Minnesota Commission on Out-of-School Time, 2005; NRCIM, 2002; Search Institute, 2005).

These and other positive youth development models typically address physical assets in a somewhat generic and minimal way, but not as explicitly as would be supported by this review of physical activity engagement and motor competence as essential positive assets not only essential for health-related reasons but transferable by girls to a variety of other life situations. Again, although not explicitly identified in many of the existing models of

Having more positive assets is associated with more positive and successful youth development.

the assets associated with positive youth development (such as NRCIM, 2004; Minnesota Commission on Out-of-School Time, 2005; Search Institute, 2005), it is our position that unique clusters of desirable assets or competencies attained through the context of physical activity participation should embrace a more explicit focus on key psychomotor and physical assets, such as movement literacy, physical and mental health, physiological capacities, motor skills, and physical activity competencies. These competencies are as essential as other more frequently identified assets to positive youth development and serve girls well in many ways. For example, being physically fit enables girls to present a strong, confident, mentally alert presence in a variety of life contexts, having the ability to competently engage in lifetime sports such as golf or tennis will advantage them in social and business settings, and being knowledgeable about sports gives them the opportunity to be conversant about topics common to interpersonal interactions.

In Table 4, we propose a developmental health assets framework for positive youth development through physical activity participation among girls that highlights and refines existing lists of positive physical assets essential for girls. This table identifies examples of those life skills or assets gleaned from the positive youth development literature, adds a cluster

Psychomotor and physical activity assets are rarely or minimally addressed in the existing positive youth development literature.

Table 4. *Assets Framework for Positive Youth Development through Physical Activity Participation among Girls*

PHYSICAL ASSETS

- Physical health
- Health- and performance-related physical fitness
- Physiological capacities
- Motor skill competencies and movement literacy
- Physical activity competencies
- Physically active lifestyles
- Knowledge about physical activities, sports, and games

PSYCHOLOGICAL ASSETS

- Commitment to physical activity
- Positive values toward physical activity
- Interpersonal competencies, teamwork, cooperation
- Positive body image and physical identity
- Mental health, positive affect, and stress relief
- Cognitive functioning and intellectual health

SOCIAL ASSETS

- Support from significant others
- Social capital and social ties
- Learning and empowerment
- Boundaries and expectations
- Constructive use of time for active living
- Healthy gender identity



of psychomotor and physical activity assets that are rarely or minimally addressed in the existing positive youth development literature, and provides a structure for ways that physical activity experiences can be organized to achieve the development of that asset or competency in girls.

Beyond the actual assets themselves, lists of essential elements in positive youth development approaches often include such components as structured learning opportunities, caring adult mentors, and transferability of skills to other life situations. With careful planning and foresight, all of these can be inherent in the context of girls' physical activity programming. For example, mentors are especially important in the positive youth development approach, and positive, caring, and engaging youth mentors abound in the physical activity and sports world, from coaches and physical education teachers to fitness leaders and trainers. Thus, helping girls initiate and maintain physical activity participation requires the careful cultivation and development of many assets that support that participation, and, in turn, many of these assets can be built through intentional structuring of physical activity opportunities. In other words, movement skills are life skills or assets, and as such deserve more attention within the broader frameworks of positive youth development so popular in today's youth work.

As further evidence of this concept, there is a long tradition in physical education and kinesiology of identifying developmental trajectories and ways to teach and build motor and physical activity competencies and assets among young people. It has long been proposed that physical education curricula, the cornerstone of early physical activity learning experiences for girls, should develop diverse and adaptable sets of movement skills that serve as foundations for broader physical activity skills and for life skills that can be utilized in other domains. For example, the Purpose Process Movement Framework (PPMF) (Jewett & Bain, 1987; Jewett & Mullan, 1977) identified key movement assets that are related to both purpose (i.e., that students seek personal meaning through human movement goals and these personal movement experiences provide avenues for enriching their lives), and process (i.e., that movement processes as a category of human behavior are fundamental to increasing the range of students' movement competencies). The key professional organization in physical education, the American Alliance for Health, Physical Education, Recreation and Dance (AAHPERD), and its component organization, the National Association for Sport and Physical Education (NASPE), continue to provide curricular guidelines for best practices in early childhood physical activity (NASPE, 2002) (see Table 5) and basic standards for K-12 physical education (AAHPERD, 2006a) (see Table 6) that reflect these broad competencies. Government entities at the federal (CDC, 2006) and state (e.g., Michigan Fitness Foundation, 2007) levels provide a variety of curriculum assessment tools and program information

Mentors are especially important in the positive youth development approach.

aligned with NASPE and state and local standards that can help schools evaluate, develop, and select existing curricula to ensure that their physical education programs are providing girls with the best possible physical activity opportunities.

Table 5. *Early Childhood Physical Activity Guidelines (NASPE, 2002)**

GUIDELINES FOR INFANTS

There are five guidelines for each age group and they are intended to answer questions relative to the kind of physical activity, the environment and the individuals responsible for facilitating the activity. Part of the infant's day should be spent with a caregiver or parent who provides systematic opportunities for planned physical activity. These experiences should incorporate a variety of baby games such as peekaboo and pat-a-cake and sessions in which the child is held, rocked and carried to new environments.

Guideline 1. Infants should interact with parents and/or caregivers in daily physical activities that are dedicated to promoting the exploration of their environment.

Guideline 2. Infants should be placed in safe settings that facilitate physical activity and do not restrict movement for prolonged periods of time.

Guideline 3. Infants' physical activity should promote the development of movement skills.

Guideline 4. Infants should have an environment that meets or exceeds recommended safety standards for performing large muscle activities.

Guideline 5. Individuals responsible for the well-being of infants should be aware of the importance of physical activity and facilitate the child's movement skills.

GUIDELINES FOR TODDLERS AND PRESCHOOLERS

For toddlers, basic movement skills such as running, jumping, throwing and kicking do not just appear because a child grows older, but emerge from an interaction between hereditary potential and movement experience. These behaviors are also clearly influenced by the environment. For instance, a child who does not have access to stairs may be delayed in stair climbing and a child who is discouraged from bouncing and chasing balls may lag in hand-eye coordination.

Guideline 1. Toddlers should accumulate at least 30 minutes daily of structured physical activity; preschoolers at least 60 minutes.

Guideline 2. Toddlers and preschoolers should engage in at least 60 minutes and up to several hours per day of daily, unstructured physical activity and should not be sedentary for more than 60 minutes at a time except when sleeping.

Guideline 3. Toddlers should develop movement skills that are building blocks for more complex movement tasks; preschoolers should develop competence in movement skills that are building blocks for more complex movement tasks.

Guideline 4. Toddlers and preschoolers should have indoor and outdoor areas that meet or exceed recommended safety standards for performing large muscle activities.

Guideline 5. Individuals responsible for the well-being of toddlers and preschoolers should be aware of the importance of physical activity and facilitate the child's movement skills.

*Note: Taken verbatim from NASPE (2002)



Scholars in motor development (Clark, 2005) also recognize that the development of motor competence reflects a complex integration of nature and nurture, and lays an essential foundation for lifelong mobility and physical activity. Motor development, a disciplinary science that examines the development of movement abilities across the lifespan, emphasizes an ecological perspective of development that embraces considering the interrelationships among the individual participant, the physical activity task, and the physical and psychosocial environment in establishing developmentally appropriate motor challenges. All three of these elements must be considered in understanding the emergence of motor skills and the development of fundamental movement proficiencies such as postural control, which form the foundation for physical activity participation (Haywood & Getchell, 2005). The development of motor skills is not exclusively, nor even primarily, determined by biological maturation alone, but rather by a developmental interplay between biology, heredity, environment, adaptation, and learning (Clark, 2007). Clark (2005; 2007) identifies five motor developmental periods that are relevant to understanding best practices: reflexive, pre-adapted, fundamental motor patterns, context-specific motor skills, skillfulness, and compensation. Understanding these periods can guide the best practices of physical activity professionals so that their work can not only keep girls healthy and fit, but also help girls

Table 6. *National Standards and Guidelines for Quality K-12 Physical Education (AAHPERD, 2006a)**

The National Association for Sport and Physical Education (NASPE), the only national professional association for K-12 physical educators, has developed national standards and guidelines for quality physical education through a national consensus process. *Moving into the Future: National Standards for Physical Education*, 2nd Edition (NASPE, 2004).

A physically educated person:

Standard 1: Demonstrates competency in motor skills and movement patterns needed to perform a variety of physical activities

Standard 2: Demonstrates understanding of movement concepts, principals, strategies, and tactics as they apply to the learning and performance of physical activities

Standard 3: Participates regularly in physical activity

Standard 4: Achieves and maintains a health-enhancing level of physical fitness

Standard 5: Exhibits responsible personal and social behavior that respects self and others in physical activity settings

Standard 6: Values physical activity for health, enjoyment, challenge, self-expression, and/or social interaction

*Note: Table content taken verbatim from AAHPERD (2006a)

develop their movement competencies and motor assets as these are applicable to many life situations. The general implications derived from understanding these periods would be that during early to mid-childhood, experts recommend broad-based motor skill development and general physical activity as the critical elements, with the emphasis shifting during late childhood and into adolescence to more prescriptive physical activity with an emphasis on health, fitness, and behavioral outcomes (ACSM, 2006; Strong et al., 2005). In sum, motor development scholarship demonstrates to physical activity practitioners that motor skills must be “nurtured, promoted, and practiced” (Clark, 2007, p. 8) among girls in order to develop motor literacy as fundamental to lifelong movement.

Programs and Approaches

Another way of working toward the ultimate goal of developing ideal opportunities and programs for girls that combine best practices for all of the elements of effective physical activity promotion is to look at examples of programs and approaches that have been developed and pilot tested with girls around the country. These opportunities have the shared goals of increasing and maintaining girls’ physical activity participation in order to accrue maximum benefits and outcomes for girls.

Some pilot approaches have focused on a subset of the developmental health assets achievable through physical activity participation identified in the previous section. Others have focused on the primary outcome or asset of interest: an increase in physical activity participation. Thus the “outcome” of interest may be increased or optimal physical activity participation as the major focus, knowing as we do that many other important “outcomes” stem from the sheer act of being physically active. Thus we might consider these “component approaches,” or approaches that develop some components of effective assets such as cardiovascular health or critical literacy, but do not necessarily take a comprehensive approach to maximizing girls’ participation in physical activity.

Other approaches have by design been more comprehensive, with a focus on exemplifying and having success with developing physical, psychological, and social assets simultaneously in and through physical activity participation among girls. Using our earlier illustrations of best practices, the following summarizes some of these attempts at developing “ideal” programs and approaches as they might provide other physical activity leaders with insight into better structuring their own opportunities. These real-life “success stories” show us that developing evidence-based practices does result in the desired outcome of developing optimum physical activity participation among girls.

**Motor skills must
be “nurtured,
promoted, and
practiced.”**



COMPONENT PROGRAMS AND APPROACHES

A variety of strategies, approaches, and programs have proven to be effective in increasing and maintaining girls' physical activity participation. A sampling of these which develop some—but not all—developmental health assets are summarized in the next section, followed by summaries of girl-focused or girl-only programs and approaches. Only programs that have been rigorously and empirically tested have been chosen.

The *VERB™ It's what you do campaign*, launched in 2002, is a multicultural campaign of the U.S. Department of Health and Human Services' Centers for Disease Control and Prevention (CDC, 2007a). The overarching vision of *VERB™* is to assist youth in leading a healthy lifestyle by increasing and maintaining physical activity among “tweens” (9 to 13 years of age). Evaluation of the *VERB™* campaign examined the relationship between exposure to the *VERB™* campaign with attitudinal and behavioral outcomes. Evaluation after the first year of the campaign indicated 74% of children surveyed were aware of the *VERB™* campaign and reported sessions of free-time physical activity increased for subgroups of children 9 to 13 years of age (Huhman et al., 2005). The *VERB™* campaign was especially effective in shrinking the gap in physical activity levels between boys and girls—girls 9 to 13 years old indicated a 27% increase in free-time physical activity sessions (Huhman et al.). Researchers speculated the first-year focus message of fun and social relationships as benefits of physical activity likely appealed to girls.

SPARK physical education programs improve the development of healthy lifestyles, motor skills, movement knowledge, social skills, and health of children and adolescents by disseminating evidence-based physical activity and nutrition programs (SPARK, 2007a). Over 35 research studies on *SPARK* programs have demonstrated that the program is not only sustainable, but that children and youth who participate in *SPARK* improve “moderate to vigorous activity (above the Healthy People Goals 2010 objective), fitness, sport skills, enjoyment of physical education, academic achievement, and activity levels away from school” (SPARK, 2007b).

Bounce at the Bell is a program designed by University of British Columbia, Canada researchers to increase bone mass and structure through a simple and inexpensive physical activity—jumping (McKay et al., 2005). Fourth and fifth grade children who jumped approximately 3 minutes per day had enhanced bone mass in the weight bearing proximal femur compared to children in the control condition (McKay, et al.), a gain which may be significant enough to prevent or postpone osteoporosis later in life. *Bounce at the Bell* has been adopted by the *Action Schools! BC* program to help promote bone health in children and youth.

Action Schools! BC is a best practices model that links healthy living resources from British Columbia and across Canada to assist schools in creating individualized action plans

A variety of strategies, approaches, and programs have proven to be effective in increasing and maintaining girls' physical activity participation.

that promote and provide a foundation for life-long healthy living (Action Schools BC, 2007). This program contributes to the health of children by integrating physical activity and healthy eating messages into the fabric of the school community. *Action Schools! BC* is a comprehensive evidence-based model with demonstrated effectiveness in increasing the physical activity levels and contributing to improvements in student bone health, heart health, dietary requirement awareness, and academic performance (McKay, 2004).

Promoting Lifetime Activity for Youth (PLAY) was implemented by the Arizona Department of Health Services in 1996 as a means of promoting MVPA among fourth through sixth grade school children (Arizona Department of Health Services, 2007). It adopts a process orientation that requires a 15-minute break during the school day during which children are taught a variety of physical activities. Classroom teachers are trained by county health coordinators to implement the intervention as an adjunct to, not a replacement for, regular physical education classes. An evaluation of the effectiveness of the *PLAY* intervention among fourth grade students found that it was particularly effective at increasing the physical activity of girls (as measured by step counts) (Pangrazi, Beighle, Vehige, & Vack, 2003).

**Fun and social
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physical activity
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girls.**

GIRL-FOCUSED PROGRAMS AND APPROACHES

A number of programs and approaches are girl-focused or girl-only. These examples share a primary focus on increasing the physical activity of girls or improving the developmental health assets of girls through physical activity.

The goal of the Women’s Sport Foundation’s *GoGirlGo!* education program—featuring true-life stories from champion female athletes—is to enhance the wellness of girls ages 8 to 18 years “as they navigate between childhood and early womanhood by using sport and physical activity as an educational intervention and social asset” (Women’s Sports Foundation, 2007). This program offers a free education curriculum and membership for girls.

Girls Inc. Sporting Chance® (2007) is a motor-skill development program that gets girls ages 6 to 11 running, jumping, throwing, and kicking, among other motor skills, to provide a foundation for lifelong participation in sports. A field test of pre-to-post test motor skills showed that over 90% of girls across all ages who completed the program improved basic motor skills.

The *GirlSports Basics* program of the Girl Scouts focuses on teaching beginning sports skills (e.g., underhand and overhand throws, catching, kicking with the top and inside of the foot, striking, and batting) and promoting positive attitudes toward physical activity among girls ages 5 to 8 years (Girl Scouts of the USA, 2007). Evaluation of *GirlSports* indicated that girls’ skill levels increased in all of the sports skills tested (McNair & Hwalek, 2003).



Girl Power! is a national public education campaign created in 1996 by the U.S. Department of Health and Human Services to promote healthy lifestyle choices for adolescent girls (U. S. DHHS, 2007). The educational curriculum is designed to meet the unique needs, challenges, and interests of girls. Evaluation demonstrated an improvement in girls' academic achievement, and a decrease in truancy and disciplinary problems at school (Marshall, Matthews, & Yeager, 2001).

New Moves, a program developed within the Division of Epidemiology in the School of Public Health at the University of Minnesota, is a girls-only alternative high school physical education program aimed at obesity prevention. Based on the Social Cognitive Theory (Bandura, 1986), the objectives of *New Moves* are to bring about positive changes in physical activity and eating behaviors and to help girls avoid unhealthy weight control behaviors, in addition to helping girls function in a thin-oriented society and feel good about themselves by addressing socio-environmental, personal, and behavioral factors. Evaluation results indicated that girls in the *New Moves* program differed significantly from girls in the control group on their stage of change for physical activity, and that *New Moves* provided a safe and comfortable environment for girls who might otherwise be unmotivated to attend out-of-school time physical activities (Neumark-Stzainer, Story, Hannan, & Rex, 2003). Phase 2 of the intervention and its evaluation is currently underway as of 2007.

Girls health Enrichment Multi-site Studies (GEMS) is a two-phase obesity prevention research program which targets young African American girls ages 8 to 10 years. In Phase 1 formative evaluation was undertaken to determine best approaches before full-scale trials were initiated in Phase 2. Two critical findings emerged—program success was contingent on 1) the willingness of parents to become involved and engaged in facilitating their daughters' participation in the intervention; and 2) establishing open and trusting relationships cross-culturally and across socioeconomic lines (Kumanyika et al., 2003). Phase 2 trials and evaluation are currently underway as of 2007.

Two longitudinal research studies use components of the coordinated school health program (CSHP) model of the CDC to focus interventions on reducing the age-related decline in moderate-to-vigorous physical activity (MVPA) in middle school girls. The first study, the *Lifestyle Education for Activity Program* (*LEAP*, 2007), is a comprehensive longitudinal school-based intervention. Framed by the social cognitive theory (Bandura, 1986), *LEAP* focuses on changing personal, environmental (e.g., instructional design, policy), and social factors thought to influence physical activity. Research indicates *LEAP* is effective and that girls in *LEAP* schools are significantly more physically active (at moderate to vigorous and vigorous levels) than girls in the control condition (Felton et al., 2005). Other key findings from a multitude of *LEAP* research indicate family support is critical for

New Moves provided a safe and comfortable environment for girls who might otherwise be unmotivated to attend out-of-school time physical activities.

increasing and maintaining adequate physical activity (Dowda, Dishman, Pfeiffer, & Pate, 2007), and instructional changes which include girl-only physical education classes and activities of interest to girls should be implemented whenever possible (Felton et al., 2005).

The second study, the *Trial of Activity for Adolescent Girls (TAAG, 2007)* is a national school- and community-based intervention aimed at reversing the decline of physical activity evidenced in middle school girls. TAAG is “grounded in the social-ecological model, which targets intrapersonal variables but emphasizes interpersonal, organizational, policy, and other environmental factors that influence human behavior” (TAAG, 2007b). TAAG focuses on encouraging, increasing, and supporting a broad range of and physical activities in and out of school for girls by utilizing community and school resources, and family and peer social support. In addition, TAAG aims to create girl-friendly programs, promote physical activity through appealing channels of communication, teach girls about the benefits of physical activity, develop girls’ confidence, and help girls find activities that are enjoyable and meet girls’ individual desires and needs pertaining to physical activity (TAAG, 2007a). TAAG interventions are currently being conducted and evaluated at seven sites across the U. S. and appear to be the most comprehensive of the physical activity interventions having a primary focus on girls.

Instructional changes which include girl-only physical education classes and activities of interest to girls should be implemented whenever possible.

COMPREHENSIVE PROGRAMS AND APPROACHES

In comprehensive programs such as *developmentally focused youth sports (DYS)* programs, sports are used as a vehicle for positive youth development—including social, cognitive, physical, emotional, and psychological assets (Holt, 2008; LeMenestrel, Bruno, & Christian, 2002). What sets comprehensive programs apart from component programs is that life and sport skills are intentionally and concurrently taught, and a direct connection exists between skills that can be acquired through sport or physical activity and other life domains (Petitpas et al., 2005). Unfortunately, DYS programs are relatively few in number (Petitpas et al., 2005) and research indicates that some programs designed to facilitate positive youth development are in fact ineffective or foster negative outcomes and experiences (Fraser-Thomas, Côté, & Deakin, 2005).

Examples of DYS programs and approaches developed in the United States include *The First Tee* (Weiss, 2005, 2007), *Play it Smart* (Petitpas, Cornelius, Van Raalte, & Presbrey, 2004), *Sports United to Promote Education and Recreation (SUPER)* (Brunelle, Danish, & Forneris, 2007), and the *Teaching Personal-Social Responsibility Model (TPSR)* (Hellison & Walsh, 2002). Data-based longitudinal evidence demonstrates that *The First Tee* is an exemplary program that not only impacts youth development outcomes and teaches youth interpersonal communication, self-management, and goal setting skills in the context of golf, but that life skills are successfully transferred to other contexts (Weiss, 2005, 2007).



Results also show that in year two, 78 of 94 youth (83%) were still participating in *The First Tee*—this percentage is impressive given the average youth organization dropout rate per year is approximately 50% (Weiss, 2007). *The First Tee* is a unique DYS program that is rigorously evaluated, develops youth internal assets, encompasses a Coach Program developed on principles of positive youth development, and exemplifies features of positive development settings according to the NRCIM (2002).

To our knowledge, no evidence-based and empirically tested and proven girl-focused or girl-only DYS programs currently exist. It is possible that such programs exist outside the scope of our overview. It is our hope that by the next Tucker Center Research Report, we can give an account of numerous effective girl-focused DYS programs and be able to describe the mechanisms by which girls become and stay physically active, as well as develop positive assets. One program that holds promise is *Girls on the Run International* (GOTR, 2007). GOTR is a program for pre-teen girls which uses running as a vehicle for transformation and positive youth development, in addition to helping girls challenge societally imposed gender roles, and reducing at-risk behaviors. Evaluation of GOTR is currently underway. Girl-focused DYS programs and physical education curricula are important for girls' development.

Underserved and disadvantaged children and youth that gain the most from quality out-of-school time programming often have limited access (Hall & Gruber, 2006)—and girls are no exception. Girls, especially urban girls and girls of color, may specifically benefit from DYS programs where exposure to positive female role models is critical to dispel and counteract the negative effects of gender and racial stereotyping (LeMenestrel, Bruno, & Christian, 2002). DYS programs designed specifically for girls can also provide a safe space where underserved girls find a “second home,” develop their sense of self, express their voices, and develop and nurture positive relationships with peers and adult staff (Hirsch et al., 2000; Loder & Hirsch, 2003). Girls of color overwhelmingly cite sports and physical activity as their favorite activities in out-of-school time youth clubs (e.g., the Boys and Girls Clubs of America) where sports are more accessible and less selective and competitive—but sport offerings in youth clubs are often and predominately structured to meet the interests of boys (Loder & Hirsch, 2003).

Sports provide a meaningful activity that captures the interest and holds engagement of children and youth, and is therefore a valuable asset in addressing the critical issues facing youth (Hall & Gruber, 2006). For DYS programs to be effective, however, they must encompass features of a positive developmental setting as set forth by the NRCIM (2004) in addition to containing features of a mastery motivational climate delineated in the sport psychology literature. Programs that use evidence-based skill development, which are “SAFE”—sequential, active, focused, and explicit—are critical to successful youth outcomes (Durlak & Weissberg, 2007).

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Table 7. *Eight Domains of Coaching Competencies (NASPE 2006a, 2006b)*

EIGHT DOMAINS OF COACHING COMPETENCIES*

Domain 1: Philosophy and Ethics is a new domain title that reflects the reorganization and prioritization of standards. Standards 1 through 4 clearly articulate the importance of an athlete-centered coaching philosophy and professional accountability for fair play by all.

Domain 2: Safety and Injury Prevention maintains the core standards of coach responsibility for providing safe conditions and appropriate actions when emergencies arise. It also addresses the need for coaches to know how to effectively participate as part of the sports medicine team. Standards 5 through 11 establish expectations for coaches to create and maintain a safe and healthy sport experience for all athletes.

Domain 3: Physical Conditioning is an updated and more behavioral description of coaching responsibilities in the areas of physiological training, nutrition education, and maintaining a drug-free environment. Standards 12 through 15 highlight the importance of using scientific principles in designing and implementing conditioning programs for natural performance gains. Specific attention is given to body composition and weight management issues as well as awareness of contraindicated activities and over-training concerns. The important role physical conditioning plays in preventing and recovering from injuries is also included.

Domain 4: Growth and Development maintains its original title and importance in the scope of coaching responsibilities. Standards 16 through 18 and related benchmarks more clearly identify developmental considerations in designing practice and competition to enhance the physical, social, and emotional growth of athletes. New to this area is the identification of the coach's role in creating an inclusive learning environment that leads all athletes to feel welcome and supported and to have experiences that foster leadership skills.

Domain 5: Teaching and Communication identifies standards for sound instructional strategies and interpersonal behavior of the coach. Responsibilities for creating a positive coaching style while maximizing learning and enjoyment are established in Standards 19 through 26. Emphasis is placed on individualizing instruction, empowering communication skills, and using good management techniques in designing practices. While effective instruction should enhance athlete motivation, additional attention is drawn to the critical influence coaching behavior plays in developing self-determined and satisfied athletes. Also new are benchmarks that make coaches aware of their role in mitigating bullying and harassment in the sport environment.

Domain 6: Sport Skills and Tactics focuses on the need for coaches to have basic sport knowledge and be able to apply it to the competitive environment. Standards 27 through 29 focus on using basic sport skills and acceptance of prescribed rules in developing team and individual competitive tactics. Emphasis is placed on planning that is age appropriate, sequential, and progressive. Benchmarks highlight the coach's role in making tactical and personnel decisions during competition. Also includes definitive expectations for scouting and game analysis.

Domain 7: Organization and Administration identifies how the coach provides resources in the daily operation and management of the sport program. Standards 30 through 36 include risk management responsibilities as well as effective use of human and financial resources. Again, coaches play an important role in sharing administrative duties with any number of other stakeholders in maximizing the sport experience.

Domain 8: Evaluation is a new domain that captures the numerous assessment skills necessary to be an effective coach. Standards 37 through 40 identify the ongoing evaluation responsibilities of the coach in areas such as personnel selection, on-time reflection of practice effectiveness, progress toward individual athlete goals, game management, and program evaluation. Creating a meaningful evaluation process for self-reflection and professional growth is also included in this area.

* Note: Taken verbatim from NASPE (2006a)



Effective DYS program also require well-trained leaders who know how to mentor young people. But well-trained leaders are not always evident in physical activity programs for youth. For example, despite national standards for coach education (NASPE, 2006b) (see Table 7), 90% of youth sport coaches have no formal coach training or education in youth development (Ewing, Seefeldt, & Brown, 1996); and when coupled with the high rate of coach and youth leader turnover, the positive benefits children can derive in and through sports are uncertain and dependent on the variant expertise of adults. Program standards are a powerful accountability tool for out-of-school time practitioners such as youth sport administrators (Hall & Gruber, 2006). To increase the likelihood that positive development for girls will occur within such physical activity settings as organized sport contexts, a systematic standard-based coach education program must be implemented and enforced. Furthermore, as evidenced by the findings in the psychology chapter, educational programs are essential for helping parents, who also play a powerful role in influencing the engagement of their daughters, to be a positive influence on building girls' enjoyment, confidence, and competence in sport.

In sum, these real life examples show us that developing and implementing evidence-based practices in our programs and approaches do result in, not only the desired outcome of developing optimum physical activity participation among girls, but also helps girls accrue the development of other life skill assets. In the next section we outline an evidence-based multidisciplinary girl-focused model for promoting optimal physical activity and health for girls.

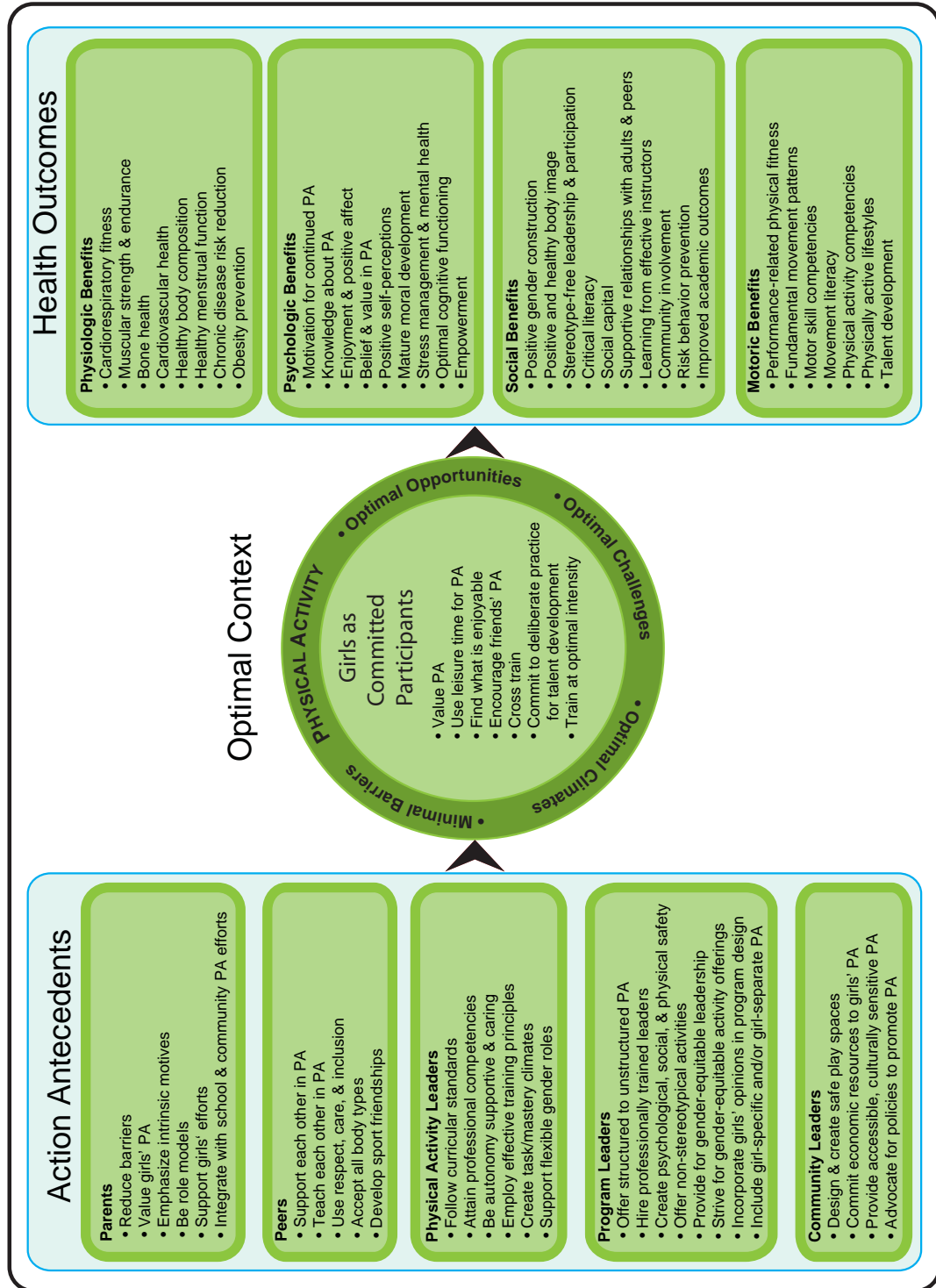
MULTIDISCIPLINARY MODEL

A blending of recommendations from recognized institutes, national entities, and governing bodies including NASPE, National Institute for Out-of-School Time (NIOST), Collaborative for Academic, Social and Emotional Learning (CASEL), Commission on Positive Youth Development, NRCIM, and others, integrated with the research-based recommendations derived from the earlier chapters in this report, helps physical activity administrators and professionals structure effective programmatic frameworks for the design of model physical activity opportunities for girls. Figure 2 illustrates an evidence-based multidisciplinary model for developing physically active girls.

This model begins by identifying five antecedent social groups that can positively influence girls' physical activity participation through their use of evidence-based action strategies. This comprehensive team approach creates optimal physical activity contexts into which the girls themselves, identified in the core of the model, enter and engage. These optimal contexts should provide optimal opportunities, challenges, and climates, and offer minimal barriers. Girls must be committed participants in these contexts through their own psychological, social, and physical engagement. Experiences in these optimal physical activity contexts result in

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Figure 2. An evidence-based multidisciplinary model for developing physically active girls.





four major interrelated clusters of health outcomes: physiologic, psychologic, social and motoric. Throughout the girls' growth and development, these processes continue to positively influence their long-term engagement in, and commitment to, physically active lifestyles.

Policy Recommendations

The following represents a composite list of policy recommendations for enhancing girls' physical activity opportunities, experiences, and outcomes as identified by the scholars contributing to this report.

- Screen female athletes for disordered eating/eating disorders and menstrual function, so that early intervention can help to decrease risk of osteoporosis.
- Develop and disseminate school- and community-based programs to increase opportunities for girls to participate in vigorous physical activity. Programs should be designed to increase all fitness components—enhance aerobic and muscular fitness, improve motor skills, build bone, and maintain joint flexibility and stability—which in turn will reduce the risk of multiple chronic diseases in girls.
- Design health and physical education classes to better address some of the health concerns particularly relevant to adolescent girls, such as proper nutrition and physical activity to maximize bone strength, dietary factors to improve mineral and vitamin status, body image issues, and weight loss.
- Sponsor environmental enhancements in neighborhoods, communities, and schools to make it safer and easier for girls and women to be physically active without fear of injury or assault.
- Promote legislative initiatives and national policy recommendations to require daily, quality physical education for grades K-12 taught by certified/licensed physical education teachers.
- Engage collaborative efforts between parents, teachers, and school administrators directed toward supplementing or replacing the typical team sport model used in physical education with an activity model that also emphasizes a variety of lifetime sports and nontraditional movement forms.
- Encourage vocal advocacy as parents, teachers, and school administrators for the inclusion of critical media literacy for girls and boys, with the focus on helping kids understand the powerful commercial interests that underlie ideal images of femininity.
- Advocate for requiring all coaches and youth sports leaders to complete standards-based educational requirements before working with girls.
- Embrace physical health and motor skill assets in contemporary models of positive youth development alongside the more typically highlighted social, psychological, and intellectual assets championed by these programs.

Nearly 30% of elementary schools do not have regularly scheduled recess.

Several current policy and legislative pushes are underway in the United States to advance physical activity participation among young people. For example, a collaborative effort between the YMCA of the USA, the National Recreation and Park Association (NRPA), and NASPE has established the Partnership for Play Every Day, which focuses on bringing “together the public, private and non-profit sectors to advance policies, programs and practices that ensure all children and youth engage in at least 60 minutes of physical activity every day” (AAHPERD, 2007a, 2007b). This collaborative effort has led to the 2007 introduction of the PLAY Every Day Act bill to the House of Representatives (H.R. 2045) and to the Senate (S. 651) (AAHPERD, 2007a, 2007b). In August 2007 federal legislation entitled the Fitness Integrated with Teaching Kids Act (FIT Kids Act) was endorsed by NASPE and the American Heart Association (AHA) and introduced in Congress. It is aimed at addressing childhood obesity through emphases on quality physical education and physical activity engagement for school children (NASPE, 2007a), coming at a time when less than 10% of elementary, middle, and senior high schools offer daily physical education for their students, and nearly 30% of elementary schools do not have regularly scheduled recess (CDC, 2000b).

Seminal reports provide many summaries and guidelines related to effective physical activity policies and programming for youth. Physical activity and community leaders would be well served by reviewing some of these reports, such as:

- *Physical Activity and Health: A Report of the Surgeon General* (U. S. DHHS, 1996b)
- *Healthy People 2010* (U. S. DHHS, 2000a)
- *Promoting Better Health for Young People through Physical Activity and Sport* (U. S. DHHS, 2000d)
- *Building “Generation Play”: Addressing the Crisis of Inactivity among America’s Children* (Stanford University, 2007)
- *F as in Fat: How Obesity Policies are Failing in America* (Trust for America’s Health, 2007a)
- *Report of the APA Task Force on the Sexualization of Girls* (APA, 2007)

Professional conferences and summits related to the role of physical activity in public health include the Mayo Clinic Summit Action on Obesity (Mayo Clinic, 2004), which in its fourth summit in June of 2007, focused on a policy perspective for integrating diverse perspectives with the objective of reducing childhood obesity (Mayo Clinic, 2007). The Physical Activity in Contemporary Education (PACE) conference was held in September 2007 in response to the passage of legislation by the U.S. Congress requiring schools that participate in the National School Lunch Act to implement wellness plans, with the purpose of the conference being to inform physical education teachers of the latest in resources and research to prepare them for



the challenges of assuming physical activity and wellness leadership roles within their schools and local communities (NASPE, 2007b). The Citizenship Through Sports Alliance (2005) convened a panel of youth sport experts to rate the quality of the experiences children and youth have in youth sport programs, and how these affect their continued participation, or dropout, from these specific physical activity settings. Many other such meetings reflect the urgency our communities feel in creating more physically active young people.

A broad and diverse set of government, educational, private, and professional groups endorse policies that increase physical activity levels among children and youth. The Trust for America's Health (2007c) identified several key health policy initiatives that are related to girls' physical activity participation, such as a federal government national strategy for combating obesity, increasing opportunities for physical activity in schools, and research on how to effectively promote healthy practices. Key findings of a public opinion survey on obesity (Trust for America's Health, 2007b) show that over two-thirds of Americans do not believe children get enough physical activity either during or outside of the school day, and are in support of policy proposals to increase physical activity in schools. In 2006 (AAHPERD, 2006c) the NASPE and the AHA identified several specific recommendations

Table 8. *Shape of the National Recommendations for School Based Physical Education Programs* (AAHPERD, 2006c).*

NASPE and AHA recommend the following:

- Quality physical education is provided to all students as an integral part of K-12 education.
- Physical education is delivered by certified/licensed physical education teachers.
- Adequate time (i.e., 150 minutes per week for elementary school students; 225 minutes per week for middle and high school students) is provided for physical education at every grade, K-12.
- All states develop standards for student learning in physical education that reflect the National Standards.
- All states set minimum standards for student achievement in physical education.
- Successfully meeting minimum standards in physical education is a requirement for high school graduation.
- Other courses and activities that include physical activity should not be substituted for instructional physical education.
- Physical activity is incorporated into the school day, in addition to physical education, through elementary school recess, physical activity breaks, physical activity clubs, special events, etc.
- Parents monitor and support their child's physical education progress and regular participation in physical activity.
- Communities provide and promote the use of safe, well-maintained and close-to-home sidewalks, bike paths, trails, and recreation facilities.

The diversity of groups concerned about creating more physically active young people reflects the urgency and importance of the issue.

* Note: Taken verbatim from AAHPERD (2006c)

related to the incorporation of more school-based opportunities for physical education, recess, integration of physical activity into other subject areas, and active transport (see Table 8). The American Academy of Pediatrics (2006) advocates in their policy statement on preventing childhood obesity through increasing physical activity that a wide variety of physical activity opportunities, both in school and out of school, should be offered and endorsed by policymakers from influential professional organizations.

Future Research Directions

A combination of targeted scholarship and action research based on reflective practice by professionals will provide us with future evidence on the benefits of physical activity for girls' health and wellness, and on effective programming for girls' physical activity promotion and broader assets development. Based on existing gaps in the literature, the following represents a brief list of future research directions identified by the scholars contributing to this report.

Studies needed to examine psychosocial factors would address such things as the:

- Specific strategies that are effective for physical activity leaders in creating task-oriented, instructive, and supportive climates.
- Role of psychosocial factors in sport talent development.
- Ways to generate girls' interest in and believed importance of physical activity and health improvement.
- Relationship between school physical education and school behavioral and learning outcomes (such as identified by AAPHERD, 2006b, see Table 9).
- Improvement of girls' physical competence self-perceptions and confidence.
- Reduction of girls' social physique anxiety and the development of healthy body images.
- Creation of physical activity opportunities and climates that are enjoyable to girls.
- Effect of life skills learned in physical activity contexts on physical activity participation throughout the lifespan.
- Evaluation of developmental programs and their effectiveness in achieving desired outcomes, such as the transfer of physical activity and motor assets and life skills to other life contexts.
- Unique and common influence of peers, coaches, teachers, and parents on motivation in physical activity contexts.
- Effects of increased physical activity time on school performance and cognitive functioning.

Over two-thirds of Americans do not believe children get enough physical activity either during or outside of the school day, and are in support of policy proposals to increase physical activity in schools.



Studies needed to examine sociocultural factors would address such things as the:

- Influence of girl-focused or girl-only physical activity programs on girls’ psychosocial outcomes and physical activity.
- Power of critical media literacy training on girls’ self-perceptions—body image, body satisfaction and gendered beliefs of body ideals.
- Intersections among race, class, and gender as a means to understand the barriers preventing girls from participating in physical activity (e.g., girls of color seem to have more obstacles to participation in sports and physical activity than white girls).
- Alternatives to the competitive model of sport that is typically employed in physical education classes in primary and secondary schools.
- Interviewing of adolescent girls to discover what they need and want for physical activity classes—in addition to their concerns (female body image, female sexuality, bodily changes in adolescence, etc.)—so that classes have greater relevance and girls experience themselves as active participants in change.
- Best ways to challenge the routine surveillance and sexualization of girls and women, as it results in their objectification.
- Inequities of being a girl or woman and how to advocate for changes, not only in sport and physical activity, but in the larger gender order of society.

Table 9. *Public Policy Agenda for Physical Education Research* (AAHPERD, 2006b).*

<p>Critical research studies needed:</p> <ul style="list-style-type: none"> • Relationship between physical competence (motor skills), learned in school physical education classes, and physical activity participation throughout the lifespan • Relationship between school physical education and physical activity participation outside of physical education class during the K-12 school years • Relationship between school physical education and school behavioral and learning outcomes • Amount of school physical education necessary for all students to meet national and/or state standards for physical education • Development of valid and reliable tools to collect national data on physical activity, school physical education, and sport participation in elementary- and middle school-aged youth (such a tool currently exists only for high school-aged youth—the CDC’s Youth Risk Behavior Survey [YRBS]) • Development of a “formula” to calculate the cost of daily physical education taught by a certified physical education teacher for all K-12 students (cost per state; cost per school district)
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* Note: Taken verbatim from AAHPERD (2006b)

Studies needed to examine physiological and metabolic benefits would address such things as the:

- Changing values and social norms for physical activity, and whether they can promote sustained increases in activity levels among girls and young women.
- Longitudinal impact of school and non-school sports and physical activity participation on aerobic fitness levels in girls.
- Longitudinal indicators of aerobic fitness levels and health/chronic disease in young and adolescent girls.
- Associations between strength/power exercise and injury prevention in adolescent athletes and non-athletes.
- Strength/power exercise effects on bone architecture and bone strength of pre- and peri-pubertal girls.
- Relationship between bone mineral density (BMD)/bone architecture and sports injury in adolescent athletes.
- Success of recent clinical trials examining the role of lifestyle interventions on Type 2 diabetes development, such as the Diabetes Prevention Program (2002), and whether they are effective for younger populations.
- Prevention of osteoporosis by very early intervention in children and adolescents, and developing and evaluating cost-effective interventions for this population.
- Identification of ways to increase and sustain increases in physical activity of girls and adolescent women.

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Summary

All girls can and should be physically active because many healthful outcomes accrue when girls are physically active on a regular basis. Psychological, social, and physical health and wellness, and the establishment of lifetime commitments and habits oriented around continued physical activity are essential to advantage girls' lives. Successful physical activity outcomes for girls are achieved through a comprehensive network and deliberately structured opportunities, experiences, and programs in diverse physical activity settings—both during their school days and in their out-of-school times. Adult leaders have the power to establish complementary and philosophically consistent programs that engage and engender girls' long-term physical activity participation through their employment of professional best practices. It is our hope that *The 2007 Tucker Center Research Report* will serve as an inspiration and catalyst for such change.

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“Developing physically active girls is a significant public health issue, but the potential benefits are immeasurable. One way to develop a national commitment ensuring that every girl has ample opportunity to fully engage in sport and physical activity is to use research as a pathway to knowledge.”

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