

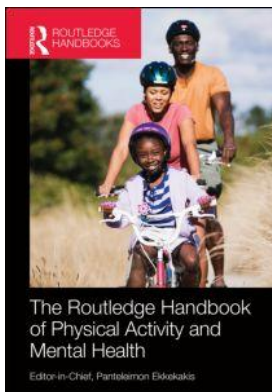
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PART 4

Self-perceptions and self-evaluations

Edited by
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11

PHYSICAL ACTIVITY AND SELF-PERCEPTIONS AMONG CHILDREN AND ADOLESCENTS

Lindsay E. Kipp and Maureen R. Weiss

Physical activity has the potential to enhance children's and adolescents' mental health and overall well-being (Smith & Biddle, 2008; Weiss, 2004). One important aspect of well-being is positive self-perceptions, or favorable beliefs about oneself and one's abilities (Horn, 2004). Positive self-perceptions are associated with adaptive cognitive, affective, and behavioral outcomes, such as enjoyment, self-determined motivation, and physical activity (Crocker, Kowalski, & Hadd, 2008). It is important to understand the underlying mechanisms for improving self-perceptions and physical activity levels because this knowledge can help researchers and practitioners envision interventions to simultaneously promote both outcomes among youth.

We conceptualize physical activity within structured settings, such as organized programs, school physical education, and out-of-school-time sports, which have been primary contexts in which self-perceptions have been studied. We highlight structured physical activities because they maximize opportunities for skill mastery and positive interactions with significant others, which can foster enhanced self-perceptions. Physical activity is thus inclusive of variations in frequency, intensity, duration, and type found in structured school and out-of-school-time programs.

We discuss knowledge about and implications for promoting self-perceptions and physical activity for youth. First, we review theoretical approaches for understanding the significance of self-perceptions. Second, we synthesize robust research findings on the linkage between physical activity and self-perceptions, including correlational, longitudinal, and intervention studies. Finally, we conclude with limitations of current research and recommendations for future studies on the self-perception/physical activity link.

Definitions and terminology

Numerous terms and types of self-perceptions have been specified in the physical activity literature (Horn, 2004). Self-perceptions and self-concept will be used interchangeably and refer to one's judgments, evaluations, and beliefs about oneself. Self-perceptions can take on global, domain-specific, and situation-specific forms. At the broadest level, self-esteem or self-worth refers to evaluations of one's significance or value as a person. Self-esteem is multidimensional in that perceptions of ability in different domains (e.g., academic, physical, social) contribute to overall self-esteem (Fox, 1997; Harter, 1999). However, self-esteem is not simply an aggregate of one's

perceived abilities; starting around age 8 children begin to form global self-evaluations independent of domain-specific judgments (Harter, 1999).

At a domain-specific level, perceived competence is one's evaluation of his or her *ability* in a particular domain (e.g., physical, academic) or subdomain (e.g., soccer, math) (Harter, 1999; Horn, 2004). Perceptions of competence in domains that are developmentally relevant and personally important contribute to one's global self-esteem. For example, perceived physical competence and physical appearance are consistently related to cognitive, affective, and behavioral outcomes among youth (Weiss, Amorose, & Kipp, 2012).

Extending Harter's (1985, 1988) construct of perceived *physical* competence, Fox (1997) customized the construct *physical self-worth*, defined as evaluation of one's physical self. Physical self-worth is the overarching construct and is made up of perceived athletic competence, physical appearance, physical strength, and physical conditioning. The significance of this approach is in deconstructing global self-worth (physical self-worth) and perceived physical competence (athletic, appearance, strength, conditioning) to refined ways of investigating physical activity as a context for promoting self-perceptions.

At the most specific level, self-efficacy is a situational form of confidence or belief that one can successfully complete a task (Bandura, 1986). For example, *self-efficacy to be active* and *self-efficacy to overcome barriers to being active* have been typical ways of assessing youths' self-perceptions (e.g., Motl, Dishman, Saunders, Dowda, & Pate, 2007; Motl et al., 2005).

Theoretical perspectives for understanding self-perceptions among children and adolescents in the physical domain

We briefly review social-cognitive theories and other conceptual approaches that are useful for describing and explaining the relationship between youth physical activity and self-perceptions.

Model of global self-worth

Harter's (1987, 1999) model of global self-worth provides a developmental framework for understanding antecedents and consequences of self-esteem. Antecedents include perceived competence and perceived social regard (e.g., reflected appraisals by significant others), whereas consequences include affect and motivation. In the physical domain, significant others such as parents, coaches, and teammates can impact youths' self-perceptions that, in turn, influence emotional responses and motivation for physical activity.

Harter's (1987, 1999) model considers changes in the structure, content, and processes of self-judgments from early childhood through adolescence (Harter, 1999; Horn, 2004). First, the number and type of competence subdomains vary over the childhood years. During early childhood (ages 4–7), children evaluate themselves in five subdomains (cognitive, physical, social, appearance, behavior), but these are not clearly differentiated. Young children have not yet constructed a sense of global self-worth because they do not have the cognitive capacity to integrate domain-specific abilities into a broad perception. As youth move into middle to late childhood (ages 8–11), they differentiate the five competence subdomains as well as a sense of global self-worth. Adolescence (ages 12–18) is a time of increasing cognitive maturity and further differentiation of three new competence subdomains: job, close friendships, and romantic relationships.

Second, developmental differences in cognitive processes involve changes in sources of competence information (Horn, 2004; Horn & Amorose, 1998). Younger children rely on simple task accomplishment, effort, and feedback from significant adults to judge their physical abilities,

whereas youth in middle to late childhood use additional sources like performance outcome, peer comparison, and skill improvement. Adolescents experience greater differentiation of information sources (e.g., delineation of feedback from others) and use self-referenced sources more frequently (e.g., improvement, enjoyment) than those who are younger.

Third, the social environment also contributes strongly to judgments about the self (Horn, 2004; Weiss, Bhalla, & Price, 2008). During early and middle childhood, parents are a predominant source of competence information. In late childhood and adolescence, teachers, coaches, and peers are used more frequently as credible sources, and youth may place more emphasis on outperforming others and social comparison. This shift in emphasis helps explain youths' increasing use of norm-referenced criteria to judge their ability as they get older. However, older adolescents are able to integrate multiple sources, which should facilitate positive self-perceptions (e.g., Horn, Glenn, & Wentzell, 1993; Weiss & Amorose, 2005). Thus, significant others who emphasize multiple sources for judging physical ability (e.g., effort and improvement in addition to social comparison) should contribute to adaptive competence beliefs.

Social cognitive theory

Bandura's (1986) social cognitive theory has been useful for understanding self-perceptions and physical activity behavior among youth (Ward, Saunders, & Pate, 2007). According to this theory, characteristics of the person (notably self-efficacy), their environment, and their behavior influence one another reciprocally. Physical activity can be explained by personal characteristics like self-efficacy to be active, environmental characteristics like social support from teachers and peers, and behavioral characteristics like goal-setting and self-regulation skills. In turn, being active can affect personal, environmental, and behavioral characteristics (e.g., regular physical activity can improve self-efficacy for future activity).

Positive youth development

The positive youth development framework (PYD) focuses on promoting potential in children and adolescents, with a focus on external assets (social-environmental enablers) and internal assets (social, psychological, and physical competencies) (Eccles & Gootman, 2002; Lerner, Almerigi, Theokas, & Lerner, 2005). Internal assets include self-perceptions (global self-esteem, perceived competence, self-efficacy) and physical abilities and health (activity level, fitness, motor skills). Although conceived within mainstream psychology that emphasizes school and family contexts, researchers have customized the PYD framework in *physical activity contexts* (Weiss, 2008; Weiss & Wiese-Bjornstal, 2009). School physical education and after-school sport programs connote settings in which caring and knowledgeable adults can nurture physical and psychosocial assets.

Prevention science

Prevention science is an interdisciplinary approach focused on preventing unhealthy, maladaptive behaviors and promoting healthy, adaptive outcomes, including self-perceptions and physical activity (Coie et al., 1993; O'Connell, Boat, & Warner, 2009). Scholars have shifted away from the traditional disease model to one that includes prevention *and* promotion. Prevention science emphasizes holistic health, or the idea that mental and physical health are inseparable. Youth who are regularly active should experience greater perceived competence and self-esteem, and youth who display positive self-perceptions should be more active (e.g., Fredricks & Eccles, 2005). Prevention science and PYD are useful approaches to the problem of declining physical

activity levels because interventions can help prevent sedentary behavior while at the same time promoting physical activity and positive self-perceptions. Conceptual approaches described have served as the basis for research on self-perceptions and physical activity among youth.

Research on physical activity and self-perceptions among children and adolescents

To make sense of research findings, this section is divided into correlational, longitudinal, and intervention studies. Correlational studies reinforce positive associations between physical activity and self-perceptions but do not specify directional influence. Longitudinal studies provide insight into the temporal ordering of self-perceptions and physical activity, and intervention studies have been conducted to determine whether structured physical activity can promote self-perceptions and other outcomes.

Correlational research

Studies support meaningful relationships between global and physical self-evaluations and physical activity for youth ages 10–17 (Fridlund Dunton, Atienza, Tscherme, & Rodriguez, 2006; Smith, 1999; Tremblay, Inman, & Willms, 2000). For example, Fridlund Dunton et al. assessed relationships among moderate and vigorous physical activity (measured by self-report), physical fitness (measured by oxygen consumption), and specific and global self-perceptions among female adolescents. Physical fitness was more strongly related to physical self-worth and self-esteem than was physical activity level. They concluded that physical activity might impact global self-perceptions through improvements in fitness, so interventions should include activities that improve fitness levels.

A number of studies support perceived competence as a correlate of physical activity for youth ages 10–18 (Crocker, Eklund, & Kowalski, 2000; Eriksson, Nordqvist, & Rasmussen, 2008; Sabiston & Crocker, 2008; Shen, McCaughtry, & Martin, 2007). For instance, Eriksson et al. found that 12-year-old children's perceived athletic competence was strongly related to their sport participation and vigorous physical activity, and partially mediated the relationship between parent and child physical activity levels. When parents were more active, children reported greater perceived competence and physical activity.

Several studies have examined the relationship between self-efficacy and physical activity. For youth ages 10–18, self-efficacy to be active and self-efficacy to overcome activity barriers are significant correlates of activity level (Martin, McCaughtry, Flory, Murphy, & Wisdom, 2011; Motl et al., 2007; Spence et al., 2010). For example, Spence and colleagues found that self-efficacy to be active was significantly related to physical activity for grade 7–10 boys and girls. When youth felt confident about their ability to be active, they engaged in physical activity more frequently.

Cross-sectional studies show consistent relationships between self-perceptions and physical activity, but the mechanisms of influence are not transparent. As we saw from theories discussed earlier, significant others strongly influence youths' self-perceptions and physical activity motivation and behavior. Several studies examined parental beliefs and behaviors (e.g., Davison, Symons Downs, & Birch, 2006), peer influence (e.g., Smith, 1999), and coach/teacher behaviors (e.g., Weiss, Amorose, & Wilko, 2009) in relation to self-perceptions and physical activity. Youths' perceptions of parent, peer, coach, and teacher behaviors are related to perceptions of competence, self-worth, and physical activity behavior. For example, Smith found that, among 12- to 15-year-old students, perceptions of peer acceptance were associated with greater physical

self-worth, positive affect, intrinsic motivation, and physical activity. Sabiston and Crocker (2008) found that perceived physical competence mediated the relationship between parent and peer influence with self-reported physical activity level among 15- to 18-year-olds.

Longitudinal research

It is important to determine direction of causality to identify interventions for improving self-perceptions and physical activity levels. Among girls, perceived physical competence and self-esteem tend to decline starting in early adolescence (Horn, 2004). Both girls and boys show a decrease in physical activity throughout adolescence, with girls consistently at lower levels than boys (Findlay, Garner, & Kohen, 2009; Pate et al., 2009). Thus, understanding factors that promote self-perceptions and physical activity is key for maximizing mental and physical well-being.

Some studies have not supported *global self-perceptions* as a predictor of physical activity (e.g., Crocker, Sabiston, Kowalski, McDonough, & Kowalski, 2006; Crocker et al., 2003; Inchley, Kirby, & Currie, 2011), but *domain-specific self-perceptions* are consistent predictors of activity level. Inchley and colleagues conducted a 5-year longitudinal study with youth ages 11–15. For boys, baseline activity and perceived competence increased the odds of being active at 2 and 4 years later. For girls, baseline activity, perceived competence, exercise self-efficacy, and physical self-worth increased the odds of being active 2 years later, and exercise self-efficacy and physical self-worth increased the odds of being active 4 years later. Youth who reported greater physical self-perceptions were more likely to engage in physical activity over time.

Some researchers have explored direction of causality between self-perceptions and physical activity by testing multiple models (Schmalz, Deane, Birch, & Davison, 2007; Trautwein, Gerlach, & Lüdtke, 2008). Schmalz and colleagues studied physical activity and self-esteem with girls at age 9, 11, and 13. Higher physical activity at ages 9 and 11 predicted higher self-esteem at ages 11 and 13. Trautwein et al. showed support for bidirectional relationships with 8- to 10-year-olds: perceived competence predicted physical activity, *and* physical activity predicted perceived competence 15 months later. Discrepant findings of these studies may be due to differing measurement periods, age groups, self-construct, and mode of assessing physical activity. It could be that domain-specific self-perceptions predict physical activity, and physical activity has long-term effects on youths' global self-esteem.

Longitudinal studies have shown that perceived competence is a predictor of physical activity (Baker & Davison, 2011; Crocker et al., 2003, 2006; Fridlund Dunton et al., 2011). Fridlund Dunton et al. assessed physical activity and global and domain-specific self-perceptions of 10th-grade girls two times, one year apart. Physical activity in 11th grade was highest for participants who were active and had higher perceived sport competence in 10th grade. Crocker et al. (2006) assessed physical activity, physical self-perceptions, and global self-esteem over a 24-month period with adolescent girls, and found that perceived physical conditioning was the only self-perception predicting change in physical activity.

Other longitudinal studies show support for self-efficacy as a predictor of physical activity level (Dishman, Saunders, Motl, Dowda, & Pate, 2009; Motl et al., 2005). Dishman et al. found that self-efficacy moderated the relationship between social support and physical activity for girls in 8th, 9th, and 12th grades. Girls who reported higher self-efficacy and social support showed less of a decline in physical activity compared to girls with higher self-efficacy and lower social support.

Intervention research

Theories discussed earlier inform age-appropriate interventions to promote self-perceptions and physical activity. Experimental designs in which an intervention is introduced and outcomes are evaluated reveal mechanisms involved in promoting health and well-being.

School-based physical activity

Interventions have been implemented in school physical education using several mechanisms to effect change in youths' self-perceptions. Researchers have been successful at promoting social support, self-efficacy, enjoyment, and physical activity (Dishman et al., 2005; Neumark-Sztainer, Story, Hannan, & Rex, 2003; Pate et al., 2005; Taymoori & Lubans, 2008). Based on social cognitive theory, the Lifestyle Education for Activity Project (LEAP) was an intervention to enhance self-efficacy and enjoyment, teach physical and behavioral skills to adopt a healthy lifestyle, and promote adolescent girls' moderate-to-vigorous physical activity (Dishman et al., 2005; Pate et al., 2005; Ward et al., 2006). These goals were accomplished through changes in the school environment, such as providing girls-only classes, providing choice in activities, encouraging social interactions, promoting lifelong activities, and providing activity opportunities in the community. Intervention schools also provided health education, staff health promotion, and family involvement. LEAP was effective in increasing participants' moderate-to-vigorous activity both in and out of physical education class (Pate et al., 2005) and revealed that self-efficacy, enjoyment, and social support are important mechanisms for increasing activity levels (Dishman et al., 2005). LEAP studies provide evidence that a theory-driven intervention, including a deliberate curriculum and trained teachers, can increase youths' self-efficacy to be active and their physical activity behavior.

Another approach to promoting self-perceptions in schools has been cooperative and team-building interventions in physical education classes (Ebbeck & Gibbons, 1998; Gibbons, Ebbeck, Concepcion, & Li, 2010; Marsh & Peart, 1988). Ebbeck and Gibbons trained middle school teachers to implement physical challenges using a cooperative-style approach with their students over 8 months. Teachers implemented activities that challenged youth to devise strategies to complete each task (e.g., helping all group members climb through an obstacle course) and reflect on group involvement. At postintervention, boys and girls in the experimental group were significantly higher on global self-worth and perceptions of athletic competence, physical appearance, and social acceptance than the control group (who participated in regular physical education activities). Gibbons et al. conducted a follow-up study with the same team-building curriculum with middle school boys and girls. The experimental group was higher in global self-worth and perceived academic competence, social acceptance, athletic competence, and behavioral conduct compared to the control group. Thus, a team-building intervention that featured positive peer interactions and group interdependence to achieve collaborative goals was successful in enhancing global and domain-specific self-evaluations.

Interventions for preschool and kindergarten children have been effective at promoting physical self-perceptions (Robinson, 2011; Robinson, Rudisill, & Goodway, 2009; Valentini & Rudisill, 2004). Robinson et al. examined the effect of instructional style during a 9-week motor skill program on preschoolers' perceived physical competence. At-risk participants (e.g., single-parent household, poverty, parental unemployment) were randomly assigned to a mastery climate, low-autonomy, or comparison group. Children in the mastery climate group were afforded experiences to explore multiple tasks, choose activities and group members, assume leadership roles, and be evaluated on effort and improvement rather than norm-referenced criteria. The low-autonomy group experienced less variety in tasks, no choice in selecting tasks or group

members, no leadership opportunities, and evaluation based on performance outcome. The comparison group engaged in unstructured free play. The mastery climate group significantly improved in perceived competence from pre- to posttest, had higher perceived competence than the low-autonomy and control group at posttest, and retained their improvement 9 weeks later. The low-autonomy and comparison groups showed no significant improvements.

School-based interventions have also focused on optimally challenging and enjoyable physical activities to promote global self-evaluations (Petty, Davis, Tkacz, Young-Hyman, & Waller, 2009; Schneider, Fridlund Dunton, & Cooper, 2008). In a randomized controlled trial, Petty and colleagues tested dose-response effects of a 3-month physical activity program with overweight, sedentary Black and White children ages 7–11 years. During the school day, youth participated in either no activity (control), 20 minutes (low-dose), or 40 minutes (high-dose) of physical activity. Activities were chosen based on their ability to elicit a heart rate of at least 150 beats per minute (e.g., running games, jump rope, basketball). Results revealed a race-by-group interaction where only White children's global self-worth improved with increased activity dosage. The authors suggested that, for Black children, the relation between self-worth and obesity may not be as strong—race may be a protective factor over weight-related self-worth. In sum, physical activity interventions in schools have successfully promoted global and domain-specific self-perceptions through mechanisms such as teacher support, a mastery motivational climate, opportunities for skill building, cooperation and team building, and engaging in enjoyable, physically intense activities.

Out-of-school-time physical activity

Programs outside school provide unique settings in which to promote self-evaluations and physical activity behavior. One approach to promoting self-esteem and perceived competence has been training coaches to provide appropriate reinforcement and feedback and then assessing change in participants' psychosocial outcomes over the course of a season (e.g., Barnett, Smoll, & Smith, 1992; Smoll, Smith, Barnett, & Everett, 1993). Smoll and colleagues employed a coach-training intervention with boys' baseball coaches designed to emphasize (a) reinforcement for good performances and effort, (b) mistake-contingent encouragement, and (c) corrective and technical instruction given in a non-judgmental way. Coaches were also encouraged to avoid or minimize using punitive instruction. At the end of the season, boys who played for the trained coaches and started the season with low self-esteem showed significant increases in self-esteem, while those in the control group did not. Thus, children who have the most to gain from a positive sport experience benefit greatly from having a coach who uses positive forms of instruction. In addition, players of trained coaches reported greater baseball competence, enjoyment, and liking of teammates compared to controls. These variables should relate to continued physical activity participation. Indeed, in a follow-up study 1 year later (Barnett et al.), players for the trained coaches exhibited a lower attrition rate than players in the control group (5% versus 26%).

Positive self-perceptions also result when coaches and instructors emphasize a mastery motivational climate and demonstrate autonomy-supportive behaviors (Coatsworth & Conroy, 2006, 2009; Theeboom, De Knop, & Weiss, 1995). Theeboom et al. randomly assigned 8–12-year-old youth to an experimental (mastery climate) or control group (traditional approach) for learning martial arts skills during 3 weeks of a summer program. The experimental group instructor highlighted effort and improvement rather than social comparison, used a variety of tasks with skill progressions rather than traditional drills, and provided participants with activity choices rather than teacher-determined drills. At postintervention, youth in the mastery climate group reported greater enjoyment and demonstrated better skills than the traditional group, and interviews

indicated increased perceived competence and intrinsic motivation in connection with the intervention. The mastery motivational climate was successful in enhancing perceptions of competence, intrinsic motivation, and motor skills, which should relate to continued physical activity.

Some out-of-school-time programs have focused on promoting girls' self-perceptions and physical activity attitudes and behaviors. Girls on the Run (www.girlsontherun.org) is a 12-week physical activity-based youth development program for 8–13-year-old girls, aimed at teaching skills to lead a physically active lifestyle and achieve favorable self-perceptions. Coaches attend a two-day training to learn how to deliver the deliberate curriculum in a developmentally appropriate way. Sessions include lessons on running, other physical activities, and life skills, including psychological, social, and physical assets (e.g., positive relationships, healthy eating). Evaluation studies show significant increases from pre- to postintervention for self-esteem, physical self-perceptions, body size satisfaction, and physical activity attitudes and level (DeBate, Gabriel, Zwald, Huberty, & Zhang, 2009; DeBate & Thompson, 2005; DeBate, Zhang, & Thompson, 2007; Martin, Waldron, McCabe, & Choi, 2009).

Other out-of-school-time skill-building programs have been effective at improving self-perceptions for boys and girls (Annesi, Westcott, Faigenbaum, & Unruh, 2005; Bruening, Dover, & Clark, 2009). Taking a PYD approach, Bruening and colleagues conducted a 12-week physical activity program for pre-adolescent girls of color, incorporating a curriculum that included physical activities, life skills (e.g., resisting peer pressure), and healthy choices, and utilized social assets in the form of female college-athlete role models. At postintervention, interviews revealed that girls improved in self-esteem and knowledge and application of life skills to healthy living. This intervention improved self-perceptions and physical activity behavior among at-risk pre-adolescent girls.

Another physical activity-based youth development program, The First Tee (www.thefirsttee.org), uses golf as a vehicle to promote life skills and developmental outcomes, including positive self-perceptions and healthy behaviors. The program involves a motivating context (golf), external assets (trained coaches who teach golf and life skills using positive instructional behaviors) and internal assets (interpersonal, self-management, goal-setting skills). Weiss and colleagues evaluated the impact of The First Tee on positive youth development through a 4-year longitudinal study (Weiss, 2008; Weiss, Bhalla, Bolter, & Price, 2008; Weiss, Bolter, Bhalla, & Price, 2007; Weiss, Stuntz, Bhalla, Bolter, & Price, 2012). Survey and interview data with 10–18-year-old participants showed improved confidence in academic, physical, social, and moral domains over time, such as meeting new people and being socially responsible. In addition, youth in The First Tee compared favorably to youth in other programs on self-efficacy to resist peer pressure for high-risk behaviors and self-efficacy to regulate learning. The intentional curriculum and trained coaches using a mastery-oriented approach were contributors to positive self-perceptions and associated life skills.

In sum, out-of-school-time programs are unique settings to incorporate physical activities, life skills, health education, and instructors who communicate lessons within a mastery climate. Successful interventions in and out of schools reveal common mechanisms to improve self-perceptions and physical activity levels, and provide support for theories and non-experimental studies that suggest the powerful influence of social-environmental factors.

Recommendations for future research

Our review suggests there is much to be encouraged by—robust findings show that self-evaluations and physical activity are strongly associated. Still, limitations exist that can be considered in future studies to elevate knowledge about physical activity as a context for

promoting self-perceptions. First, given the diverse ways in which “the self” is conceived—global self-worth, perceived competence, self-efficacy—researchers should carefully consider which construct is most appropriate to measure in relation to their research questions. A good example is a fitness intervention study by Marsh and Peart (1988) with adolescent girls. They hypothesized that (a) girls in the cooperative group would be superior to competitive and control groups at postintervention on perceived physical ability and physical appearance and (b) there would be no between-group differences on nonphysical self-perceptions (e.g., academic, social). Given the short duration (6 weeks) and nature of the intervention (physical fitness), identifying physical self-perceptions as the target variables, and not global self-worth or nonphysical self-perceptions, made sound conceptual sense. Thus, level of self-perception construct is an important consideration in conjunction with the research question and study design.

Choice of self-perception instrument should be developmentally appropriate (Brustad, 1998). Harter (1985, 1988) validated global and domain-specific measures of self-perceptions for children and adolescents based on extensive psychometric testing. Yet some studies modified these measures by altering item content and response format without providing validity data for modifications. Without such information, we do not know whether results can be attributed to study variables or measurement error. In addition, studies used a wide range of age groups for examining self-perceptions and physical activity. Because children and adolescents vary in cognitive, social, and physical development, researchers should provide a rationale for the specific ages they include in their study (Brustad, 1998). It is advisable to limit the age bandwidth so that findings are not confounded by cognitive and physical developmental differences. Depending on the ages included, an assessment of physical maturity (i.e., pubertal status) would control for developmental differences within chronological age and be helpful for explaining study findings (e.g., Baker & Davison, 2011; Kipp & Weiss, 2012; Smith, 1999).

Another consideration is variation in modes of assessing physical activity. Conflicting findings may have emerged across studies because different methods were used to assess activity, including accelerometers, self-report, parent report, and pedometers. Accelerometers are relatively objective and capable of quantifying movements, but the downside is that they are expensive and multiple data points are necessary to obtain valid assessments of activity level. These limitations make it a challenge to use with large samples. Self-report surveys, while accessible and conducive to large samples, are more subjective and prone to social desirability. In some studies, self-perceptions are assessed relative to participating in a physical activity-based program that is not quantified per se (e.g., yes/no response for sport participation). In the future, associations between physical activity and self-perceptions should account for how variations in frequency, intensity, duration, and type of activity are assessed and quantified.

Different data analytic methods have been used, which may contribute to variations in interpreting findings. Studies used analysis of variance, several regression techniques, structural equation modeling, multilevel modeling, and group classification methods. The data analysis should be a good “fit” to the research questions and hypotheses. For example, multilevel modeling is designed to account for dependencies among individuals’ data within a group (e.g., participants within classes). This is conceptually accurate, but if there is little dependency in the data (as assessed by intraclass correlation), inadequate power due to insufficient sample size at the group level (level-2 cluster), and multiple outcome variables that should be analyzed simultaneously, then this technique may not be appropriate to accurately assess the self-perception/physical activity relationship. Researchers should remain focused on the research goal by conducting appropriate analyses that do not obscure what the data mean.

Finally, more longitudinal, intervention, and evaluation studies are needed to determine effectiveness of protocols and programs on youth self-perceptions. Such designs are capable of

quantifying evidence of change, whether effects are immediate or enduring, and which mechanisms are responsible for successful outcomes. To this point, future studies must include control or comparison groups and multiple data points to establish causal effects of programs on self-perceptions and activity levels. Such designs can also untangle the proverbial chicken-and-egg question: do variations in physical activity predict change in self-perceptions or do modifications to self-perceptions translate to greater physical activity levels? Answers are important for determining which intervention components are most likely to promote physical and psychosocial well-being among youth.

Conclusion

Physical activity is important for children's and adolescents' physical and psychosocial well-being, including an active lifestyle and favorable self-perceptions. Structured settings such as school physical education and out-of-school-time sports have the potential to provide youth with opportunities to enhance self-efficacy, perceived competence, physical self-worth, and self-esteem. Heightened self-perceptions, in turn, are associated with initiating, maintaining, and enhancing physical activity frequency, duration, and intensity, which is seen in youths' choice to return to activity programs and exert sufficient effort to attain health benefits. Correlational studies provide support for relationships between self-perceptions and physical activity, whereas longitudinal and intervention studies help uncover direction of causality and mechanisms of influence. More theory-driven physical activity interventions that incorporate positive social-environmental factors and a curriculum that entails teaching life skills and healthy behaviors should continue to be conducted. Ultimately, definitive data-based evidence can reveal the power of physical activity to successfully enhance youths' sense of self and interest in embracing physical activity as a lifestyle choice.

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