Journal of Teaching in Physical Education, **2016, 35, 381-389**
http://dx.doi.org/10.1123/jtpe.2016-0100

Human Kinetics
ARTICLES

The SPARK Programs: A Public Health Model of Physical Education Research and Dissemination

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SPARK [Sports, Play, and Active Recreation for Kids], in its current form, is a brand that represents a collection of exemplary, research-based, physical education and physical activity programs that emphasize a highly active curriculum, on-site staff development, and follow-up support. Given its complexity (e.g., multiple school levels, inclusion of both physical education and self-management curricula), SPARK features both diverse instructional and diverse curricular models. SPARK programs were initially funded by the NIH as two separate elementary and middle school intervention studies, and the curriculum and instructional models used in them embody the HOPE (Health Optimizing Physical Education) model. This paper reviews background information and studies from both the initial grants (1989–2000) and the dissemination (1994-present) phases of SPARK, identifies program evolution, and describes dissemination efforts and outcomes. Procedures used in SPARK may serve as models for others interested in researching and disseminating evidence-based physical education and physical activity programs.

***Keywords*:** physical activity, exercise, children, school

Physical education (PE) is the largest organized program that promotes youth physical activity, yet there have been long-term concerns about whether the quality and quantity of PE is sufficient to meet the health needs of youths (Sallis & McKenzie, 1991). SPARK [Sports, Play, and Active Recreation for Kids], in its current form, is a brand that represents a collection of exemplary, research-based physical education and physical activity programs that emphasize a highly active curriculum, on-site staff development, and extensive follow-up support. These programs are based on a public health model designed to combat low levels of children's physical activity and physical fitness (Sallis, McKenzie, Alcaraz, Kolody, Faucette, & Hovell, 1997). SPARK, which initially began in 1989, was funded by the National Institutes of Health [NIH] through two separate large-scale elementary and middle school intervention studies. Both studies showed positive results on multiple outcomes (Sallis et al., 1997; 2003), and efforts to disseminate the intervention programs were initiated over 20 years ago on a fee-for-service basis.

Based on the findings of the studies and the extensive field testing of dissemination efforts (which include responding to changing public health needs, market demand, and feedback from users), SPARK has evolved by expanding programs, more fully embracing the com-

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prehensive school health model, and integrating technology into teacher development and training. Dedicated to creating, implementing, and evaluating research-based programs that promote lifelong wellness, SPARK now disseminates evidence-based PE for K-12 as well as after school, early childhood, classroom and recess physical activity, and coordinated school programs (http://www.sparkpe.org).

Given the complexity of providing distinct programs at multiple school levels that range from early childhood through high school and including both physical education and self-management curricula, SPARK embraces diverse instructional and diverse curricular models. Importantly, as illustrated in the sections that follow, the various SPARK programs have undergone extensive research, and thus their curricular and instructional practices are evidence-based. Subsequently, in addition to providing successful exemplars for both PE curriculum and instruction, SPARK serves as a model for quality research and dissemination practices that involve substantial collaboration among three sectors: university, public school, and private sectors. This paper presents background information and reviews some of the research on the SPARK programs that were initially developed for elementary and middle schools (1989–2000) and describes how SPARK has evolved, including approaches used to facilitate program dissemination nationally and internationally since 1994.

A Model for Researching Physical Education Curriculum and Instruction

Funding by the NIH for the two initial SPARK programs over a 12-year period (approximately 4 million dollars) enabled the researchers to conduct quality systematic intervention research. This included (a) a year of funding for each research project that allowed both measurement and intervention strategies to be developed, (b) schools being randomly assigned to intervention or control conditions, (c) diverse measurement strategies to assess multiple formative, process, and outcome variables, (d) separate intervention and measurement teams to reduce bias, (e) and the research being collaborative across disciplines and agencies (i.e., university, school, community).

Of particular importance was the availability of financial resources that allowed for the design and testing of curricular and instructional assessment tools. These included SOFIT [System for Observing Fitness Instruction Time] that assesses student physical activity levels, lesson context, and instructor behavior during PE classes (McKenzie, Sallis, & Nader, 1991) and SOPLAY [System for Observing Play and Leisure Activity in Youth], which permits the assessment of student physical activity levels and associated environmental contexts during non-PE programs, including those offered at recess and before and after the school day (McKenzie, Marshall, Sallis, & Conway, 2000). These tools are now widely used (McKenzie & van der Mars, 2015) and apps for iPads have been developed and made available free to enable others to use them to record and manage research and program data.

Overview of the SPARK Curriculum and Instruction Model

SPARK curriculum and instruction strategies were based on a concept initially known as "health-related physical education" (Sallis & McKenzie, 1991), now referred to as the HOPE (Health Optimizing Physical Education) model (Metzler, McKenzie, van der Mars, Barrett-Williams, & Ellis, 2013a, 2013b; Sallis et al., 2012). A salient feature of HOPE is that curricula and their delivery (including instruction) are directed toward public health objectives, with the main tenet of developing lifelong physical activity. In short, HOPE includes curricula and instruction which: (a) provide ample enjoyable opportunities for physical activity during class time; (b) teach generalizable movement and behavioral skills; and (c) encourage present and future physical activity and physical fitness. This suggests that PE time should be an enjoyable, highly active experience during which students learn generalizable movement and behavioral skills that will transfer into diverse activities, sports, and games offered at school, in the community, and later in life. As implied in its name, SPARK goals are designed to extend far beyond PE to include diverse forms of sports, play, and active recreation. As such, SPARK includes many efforts that are currently identified as part of Comprehensive School Physical Activity Programs (CSPAP) (CDC, 2013)

While these concepts are commonplace today, they were not when SPARK was initiated. Before the Sallis and McKenzie 1991 paper, recommendations for moderate-to-vigorous physical activity (MVPA) within and outside of physical education were rare. Although *Healthy People 2000* (USPHS, 1991) did recommend students should be active during at least 50% of PE lessons, this concept did not immediately translate into practice guidance. For example, the National Association for Sport and Physical Education did not adopt a similar recommendation until about 2004 (NASPE, 2004).

Physical activity contributes to the prevention and control of obesity, diabetes, and heart disease risk, and many public health groups and government agencies (IOM, 2013; Pate, Davis, Robinson, Stone, McKenzie, & Young, 2006; USDHHS, 2015) now call for schools to be proactive in promoting physically active lifestyles, especially through daily PE that is highly active (e.g., 50% MVPA). These goals, and those of SPARK, are consistent with current national PE professional objectives for PE (SHAPE America, 2015) and the 2016 *U.S. National Physical Activity Plan* (National Physical Activity Plan Alliance, 2016).

Overview of the Original SPARK Elementary Program

The initial grant from NIH (1989–1996) to San Diego State University (SDSU) was to develop and evaluate a health-related PE program for grades 3–6. The resulting program consisted of a PE curriculum designed to provide ample amounts of physical activity in class, a behavioral self-management curriculum to promote physical activity outside of school, and extensive teacher training and support. The curriculum was designed to be a practical resource for use by both classroom teachers and PE specialists. Instructional units and lesson plans were sequenced and offered details for managing students and equipment and lessons were also partially scripted to aid inexperienced teachers use appropriate instructional cues.

The PE curriculum included yearly plans divided into instructional units, typically four weeks in length and for 3 or more times per week. A standard lesson had two parts: activities with a health-fitness focus and those with a motor/sport skill focus. Health-fitness activities were embedded in instructional units that included aerobic dance, aerobic games, and jump rope activities. Progression was achieved by modifying the intensity, duration, and complexity of activities. Twelve additional units focused primarily on motor skill development, including age-appropriate skills used in sports such as basketball, soccer, and volleyball. The skills selected were those with a high potential for promoting cardiovascular fitness as well as generalizing to activities likely to be reinforced in the child's community. Low-active games and activities, such as softball, were modified to make them more active.

The curriculum also included a classroom-based self-management program designed to teach children behavior change skills believed to be important in the generalization and maintenance of regular physical activity outside of school (Marcoux, Sallis, McKenzie, Marshall, Armstrong, & Goggin, 1999). This program included instruction and practice in self-monitoring, goal setting, behavior contracting, stimulus control, self-reinforcement, self-talk/instruction, scheduling, and decision making/problem solving. These skills and related topics were taught in 30-minute classroom sessions, which were guided by scripted curricula. Manuals contained ten core self-management lessons, monthly follow-up lessons, and additional optional activities. During class students set individual physical activity goals for the coming week and a point system was used to reinforce regular activity participation. Family involvement was encouraged through monthly newsletters, homework requiring family participation, and a point system for being active with family members and friends. During dissemination the original self-management program evolved to be known as *Lifelong Wellness*. This stand-alone curriculum is no longer being disseminated; its concepts and strategies are now integrated into other SPARK programs.

The results of the evaluation of the elementary SPARK program have been presented in numerous peer-reviewed publications. The initial studies involved the randomizing of seven schools to control (i.e., schools that followed their standard PE programs) or two treatment conditions (classroom teacher-led SPARK and PE specialist-led SPARK). Briefly and in general, there were positive results for student: (a) physical activity during PE (McKenzie, Sallis, Kolody, & Faucette, 1997; Sallis, McKenzie, Alcaraz, Kolody, Faucette, & Hovell, 1997); (b) physical fitness (Sallis et al., 1997); (c) motor skill development (McKenzie, Alcaraz, Sallis, & Faucette, 1998); (d) academic achievement (Sallis, McKenzie, Kolody, Lewis, Marshall, & Rosengard, 1999); (e) adiposity (Sallis, McKenzie, Alcaraz, Kolody, Faucette, & Hovell, 1997); and (f) enjoyment of PE lessons (McKenzie, Alcaraz, & Sallis, 1994; Prochaska, Sallis, Slymen, & McKenzie, 2003). As well, process measures indicated positive results related to (a) lesson context and teacher behavior (McKenzie et al., 1997); (b) student self-management and parent behavior (Marcoux et al., 1999); and (c) program maintenance and institutionalization factors (Dowda, Sallis, McKenzie, Rosengard, & Kohl, 2005; McKenzie et al., 1997).

Overview of the Middle School Physical Activity and Program (M-SPAN)

To expand their work into middle schools and to further develop and assess programs for improving physical activity and eating on campus, the investigators received an additional 5-year grant (1996–2000). M-SPAN was designed to test a combination of environmental, policy, and social marketing interventions on increasing physical activity and reducing fat intake. The goal was to change these behaviors solely through environment and policy approaches, which were the least-evaluated components of school health interventions, and to measure these outcomes in the entire student body at school. The multicomponent intervention was tested in 24 middle schools in 5 school districts in Southern California (Sallis et al., 2003) The schools, diverse in size, facilities, and population characteristics, had an average enrollment of 1109 students, with 45% being nonwhite and 39% receiving free or low cost meals. Following baseline measures, the schools were stratified by school district and randomly assigned to receive two years of intervention ($N = 12$) or be measurement-only controls ($N = 12$).

The intervention staff consisted of three experienced, credentialed PE teachers, two of whom worked on M-SPAN about 20 hours per week. Paul Rosengard, the head PE teacher for the elementary study, served also as lead teacher for M-SPAN and he led the development of the curriculum and the PE teacher training sessions for the intervention schools. His two colleagues made regular visits to intervention schools where they provided motivation and technical support, modeled lesson segments, and gave feedback to teachers. Similar to the

elementary program, M-SPAN attempted to: (a) create awareness of the need for health-related physical activity among school personnel; (b) assist teachers in designing and implementing active PE curricula; (c) develop teachers' class management and instructional skills to enhance physical activity and student learning, and (d) provide on-going support for change. In contrast to the elementary program in which teachers implemented structured curricula and scripted lessons, M-SPAN provided only sample curricular materials and did not the mandate their use. Rather, emphasis was on helping PE specialists revise and refine their existing programs and instructional strategies to encompass a public health model. As with the elementary program, staff development sessions included a balance of didactic instruction and modeling/rehearsal. In addition, M-SPAN teachers set goals (i.e., "action plans") for modifying PE at their schools and these were reviewed periodically.

Direct observations revealed there were improvements in physical activity in specific locations on campus (e.g., before and after school), but the greatest gains for both boys and girls occurred during PE (McKenzie, Sallis, Prochaska, Conway, Marshall, & Rosengard, 2004; Sallis, et al. 2003). Overall, the changes in total physical activity at school were significant for boys, but not for girls. There was some evidence of a positive effect on boys' body mass, but the nutrition interventions did not reduce dietary fat intake at school. The study provided important information about the barriers faced by schools to fully adopting health-related programs, particularly those involving policy and environmental changes, and identified the need to specifically modify programs to engage girls in physical activity (Powers, Conway, McKenzie, Sallis, & Marshall, 2002; Sallis et al., 2003; Strelow, Larson, Sallis, Conway, Powers, & McKenzie, 2002).

A Model for Research Translation and Dissemination

To have a public health benefit, successful programs must be disseminated. This process of getting others to use an innovation or program is often referred to as *diffusion of innovation.* Diffusion has various stages, including dissemination, adoption, implementation, and institutionalization, and these sometimes overlap (Rogers, 2003). *Dissemination* is the process of creating an awareness of programs and includes informing stakeholders (e.g., school principals, teachers) about the innovation as well as persuading them to try it. *Adoption* is the decision by an entity (e.g., school district, individual schools) to commit to a program, usually defined as the purchase of program materials (e.g., SPARK print and/or digital curricula) or training (e.g., teacher staff development). *Implementation* is the process by which the adopter actually carries out the program, and *institutionalization* is the integration of the intervention into the culture of the institution (i.e., school or school district) through continued program implementation and practice (i.e., program sustainability).

Disseminating a program to schools that purchase a program is vastly different from doing controlled research on it. During the research phase schools are recruited and assigned randomly to a treatment condition, curriculum and staff development are the same at each site, and all processes and outcomes are monitored closely. Research specifically involves uniformity in regard to the curriculum, staff development and training, on-site support visits, educational materials, and physical activity supplies and equipment. Postresearch dissemination, however, involves extensive collaborations with school personnel (from district superintendents to PE teachers and classroom teachers) to ensure the programs that they want are delivered under negotiated conditions (Dulark & DuPre, 2008).

In 1993, an enterprise was established within the SDSU Research Foundation to disseminate the SPARK elementary school program on a nonprofit basis; the middle and high school program disseminations began in 2000 and 2006, respectively. Academic institutions are often challenged when working collaboratively with public and private sectors (e.g., with schools and commercial businesses), and university faculty typically don't have either the time or skill sets (e.g., to do social marketing) needed to successfully disseminate programs. Over time, the dissemination efforts far exceeded the capacity of both the program designers and SDSU, and in 2002 SDSU licensed the rights to disseminate SPARK programs to Sportime (http://www.sportime.com/), an equipment distributor and a long-time corporate sponsor of SPARK. Sportime is now part of School Specialty, an education company publically traded on NASDAQ that provides innovative and proprietary products, programs, and services (http://www.schoolspecialty.com/home.jsp). Paul Rosengard, the third author, was an experienced teacher before joining SPARK, and he led the staff development programs of both SPARK and M-SPAN. He creatively led the dissemination of the SPARK programs, oversaw many years of sustained growth, and served as Executive Director until retiring in 2015. Dr. Kymm Ballard, a university assistant professor and experienced PE teacher, teacher educator, advocate, and administrator, currently serves as the Executive Director.

The commercialization of SPARK and market demand (e.g., requests from teachers, school districts, other research programs) bought increased resources that allowed for program refinements and expansion and for improved marketing, training, and distribution efforts to be made. It is important to realize, however, that the dissemination of SPARK was planned during its inception (during the initial grant writing), and not as an afterthought. The goal was to develop a program that was both effective and feasible for wide implementation. Social Learning Theory (Bandura, 1977) guided both the development and implementation of the program's elementary school self-management curriculum and the initial diffusion efforts (McKenzie, Sallis, & Rosengard,

2009). The investigation team was very familiar with the PE profession, the preparation of teachers, and schools and how they operated. Team members had worked in relevant roles in schools (e.g., PE and health teacher and supervisor, coach, administrator, curriculum developer) and in universities preparing teachers. The investigators had also been involved a variety of formative and intervention studies relevant to the design of the intervention as well as its maintenance and potential dissemination (e.g., Faucette, McKenzie, & Patterson., 1990; Faucette, McKenzie, & Sallis, 1992; Faucette, Nugent, Sallis, & McKenzie, 2002; Lounsbery, McKenzie, Morrow, Monnat, S., & Holt (2013); Lounsbery, McKenzie, Trost, & Smith, N. J. (2011); Sallis, McKenzie, Kolody, & Curtis, 1996).

The initial dissemination strategies mainly involved developing brochures and videos that explained the scientific results in lay terms and provided a rationale for adopting SPARK. These early tactics have long been surpassed, and SPARK dissemination efforts now follow a business model that involves the expansion and revision of programs while remaining true to the tested intervention principles. Four main dissemination goals remain in place: (a) create awareness of the need for active, health-related physical activity and how SPARK can help; (b) assist schools and other entities (e.g., YMCA) to design and implement active curricula; (c) develop staff management and instructional skills to enhance physical activity and learning, and (d) provide on-going support for sustained high performance.

Diffusion Strategies

Teacher development is a central component of SPARK diffusion. SPARK conducts on-site workshops, provides Summer Institutes (i.e., 2–3 day in-depth sessions), and makes conference presentations, including many workshops. SPARK has both full- and part-time employees (mostly in San Diego) who work on teams related to four tasks: program development, dissemination, delivery, and special projects. In addition "SPARK-certified" trainers from across the US are employed on a contractual basis. These trainers are primarily responsible for conducting on-site workshops in the states where they are licensed. They are experienced instructors (most with masters degrees), who previously implemented the SPARK program in their own school and then participated in extensive training on how to teach others to implement the program. Their training consists of participating in SPARK workshops, assisting master trainers conduct programs, and assessing their own instruction using video analysis. After conducting 20 workshops successfully (i.e., receiving high evaluations) and meeting other criteria, certified trainers may advance in status to "Master Trainer" and then to "Elite Trainer." These levels bring about increased pay and responsibility. Elite trainers may be invited to present at professional conferences, conduct marketing presentations, lead media or special events, or respond to public speaking needs. To maintain consistency and keep trainers informed of latest developments, SPARK provides an intensive "Train the Trainers" workshop in San Diego each summer.

A major part of the diffusion process is a comprehensive effort to provide curricula and staff development services to schools, school districts, and other entities on a contractual basis. This effort starts with a needs analysis and consultations and these are followed by the delivery of SPARK manuals and materials, initial staff development sessions, and follow up services. A strong effort is made to establish a supportive infrastructure at a school so the program will be sustainable. After testing numerous delivery options, SPARK now provides two alternatives for in-service training: standard and premium. The standard program includes six face-to-face hours with teachers (1 full-day or 2 half-day workshops) and the premium program includes 12 instructional hours (2 full days or 4 half-days). Sessions are designed to be teacher-friendly, nonthreatening, participatory, and fun. After being introduced to the goals and philosophy of SPARK, teachers participate in selected physical activities from SPARK guidebooks that are appropriate to their grade level. SPARK trainers model both PE content and instructional and management strategies. To help solidify a commitment to teaching PE, time is provided during sessions for teachers to collaborate with others at their site (or district), schedule lessons for the upcoming semester, and plan follow-up activities with SPARK staff.

The professional development literature indicates that on-site support for teachers makes a substantial difference between the adoption and rejection of new programs (e.g., Lieberman & Miller, 1991), so school principals and other administrators are invited to participate fully in SPARK sessions. SPARK also provides additional training and materials for an on-site program facilitator (i.e., a "SPARK Star"), who agrees to be the lead person at a school. This on-site facilitator (often an assistant principal or grade-level coordinator) serves as the main contact for SPARK follow-up services and helps overcome infrastructure and implementation barriers.

Assessment of SPARK Diffusion

A diffusion goal of SPARK is to consistently deliver a high quality, standardized implementation package. Meanwhile, dissemination research clearly indicates that interventions cannot be transferred directly into other settings without appropriate tailoring and that continued development and assessment is necessary. The PE that the children eventually receive depends heavily on their teachers' willingness and ability to incorporate curricula and instructional strategies into their on-site programs. Beyond having a well-researched curriculum with a specific focus that is delivered by certified trainers under contractual conditions, SPARK includes numerous process evaluation strategies. These assessments are both informal and formal, and they provide information

concerning aspects of program delivery and help to identify what works and what does not (Faucette et al., 2002; Marcoux et al., 1999).

Informal evaluations include follow-up conversations by SPARK full-time staff with workshop trainers and with participating teachers and their on-site administrators. More formal strategies include participants completing "Workshop Evaluation" and "Presenter Evaluation" forms immediately following a workshop and then responding to an "Implementation Evaluation" questionnaire approximately six months after they implemented the SPARK program themselves. SPARK also provides "Lesson Quality Checklists" in each curriculum, and workshop attendees are instructed how to use them and how to encourage others to use them. The checklists can be used as a self, peer, or evaluative assessments (e.g., administered by a site principal), and they help provide feedback regarding SPARK implementation fidelity.

Process evaluations completed during dissemination are typically for internal purposes, such as making adjustments to curricula, instructional procedures, and workshop delivery. Based on feedback, SPARK manuals are frequently updated (e.g., improved graphics and diagrams, additional activities; specification of how activities match national standards) and music CDs and videos have been created. After nearly 27 years, most of the SPARK materials are now available on-line electronically.

Results from two early studies (McKenzie, Dart, Sallis, & Rosengard, 2003) using data collected over a 3-year period are presented here to serve as a model of assessment. In the first study, questionnaires from 1500 teachers from 257 schools who completed professional development were analyzed to determine whether their perceptions of workshop components differed by: (a) program grade level (K-2 vs. 3–6); (b) teacher type (PE specialists vs. classroom teachers); (c) year of in-service; (d) which of 16 certified SPARK trainers delivered the workshop, and (e) level of in-service. Teachers rated sessions on 12 variables using a 1–5 Likert-type scale and responded to open-ended questions. Over the three years, mean responses on all 12 variables were high (ranging from 4.5 to 5.0), indicating teachers were highly favorable toward all session components. Any low scores and written negative comments were generally related to environmental conditions that were not easily controlled (e.g., space, temperature, rain).

In the second study, 421 teachers from 72 schools in nine states completed follow-up questionnaires after implementing SPARK. They responded to 12 questions on a 1–7 Likert-type scale and to open-ended questions. Means for all 12 variables were high (ranging from 4.7 to 6.8), indicating teachers were positive toward the program and there were few significant differences by grade level, teacher type, and year. As expected, PE specialists found it easier to implement SPARK than classroom teachers (mean= 6.38 vs. 5.48, $p = .002$). With few differences on evaluations by year of implementation, teacher type, and grade level, the SPARK programs appears to be well liked by teachers and suitable to various school conditions.

Finding few differences in evaluations between classroom teachers and PE specialists was important. Much of elementary school PE is delivered by classroom teachers with limited backgrounds in PE, and SPARK has strived to ensure (a) curricula and supporting materials (e.g., unit and lesson content and sequencing, provision of management and instructional strategies, provision of precise instructional cues), (b) content and conduct of training workshops, and (c) strategies needed for sustaining the program in schools are relevant to them. Nonetheless, classroom teachers do have some very specific concerns about teaching PE and these need to be addressed during staff development (Faucette et al., 2002).

A study on the sustainability of SPARK (i.e., maintenance stage of diffusion) included evaluations from 111 elementary schools in seven US states (Dowda et al., 2005). An independent evaluator developed and mailed surveys to schools that had received SPARK curricula, training, and follow-up (response rate = 47%). Up to 80% of schools that had adopted a SPARK PE program reported sustained use of it at least four years later. Schools that continued to use SPARK held more frequent PE classes; and sustained use of the program was related to (a) support provided by school principals, (b) schools previously not having a standard PE program, (c) the availability of adequate equipment, and (d) the teachers themselves being physically active.

Another formal study assessed the adoption stage of the diffusion process. Personnel from 154 elementary schools (75 adopter, 79 nonadopter schools) in 34 states were assessed to determine their perceptions of enablers and barriers to the adoption of evidence-based PE programs, primarily SPARK (Lounsbery et al., 2011). Results suggested that dissemination efforts should target both principals and PE teachers and that increasing the school principal's knowledge about PE may be instrumental in addressing some of the barriers to the conduct of PE frequently identified by teachers.

Research Conducted by Others on the Adoption and Use of SPARK

Over the years, SPARK has partnered with many entities to engage in program development and research. These collaborations, which include SPARK involvement at many different levels such as providing curricula and staff development, adapting the curricula for special populations (e.g., Native American schools), and consulting on research design and assessment. Many of these collaborations are described in detail on the SPARK website (http://www.sparkpe.org/physical-education-resources/research-projects/). As examples, (a) Nigg and colleagues identified the successful dissemination and sustainability of the SPARK Active Recreation program in state-run afterschool programs in Hawaii over a 4-year period (Nigg, Geller, Adams, Hamanda, Hwang, & Chung, 2012), (b) Niklas et al. demonstrated the feasibility of conducting the SPARK Early Childhood curriculum with

preschool children attending Hispanic-American Head Start centers (Nicklas, Nguyen, Butte, & Liu, 2013), (c) Cardon et al. identified the positive perceptions that Belgian children, teachers, and parents held regarding the SPARK Self-Management program (Cardon, Haerens, Verstraete, & de Bourdeaudhuij, 2009), (d) Fu et al. reported that a 9-week SPARK implementation increased MVPA at middle schools significantly more than traditional programs (Fu, Gao, Hannon, Burns, & Brusseau, 2016), and (e) Belansky et al. used SPARK as part of a 2-year intervention in 17 schools in rural Colorado and showed improvements in opportunities to learn skills and engage in MVPA during PE (Belansky, Cutforth, Kern, & Scarbro, 2016). In addition to these collaborations, without prior notification reports (e.g., theses, conference papers) often emerge that indicate components of SPARK have been assessed in a study. This includes a study conducted in Iran that demonstrated the successful use of SPARK on the development of the fundamental motor skills of 4–6 year-old children (Mostafavi, Ziaee, Akbari, & Haji-Hosseini, 2013).

As with all research, it is important to be aware of study strengths and limitations. Quality intervention research includes randomization (e.g., of schools), process measures to assess program dosage and fidelity, and follow-up assessments. Funding by the NIH over 12 years permitted the initial SPARK studies to have these characteristics. Without ample funding, time and resource restrictions may require studies be limited to a small number of schools, teachers, or students, a short duration, and the use of relatively weak outcome measures (e.g., self-reports). Nonetheless, these independent evaluations are important contributions.

Challenges and Continued Development

Developing quality, relevant up-to-date programs and products while remaining true the original SPARK ideals has not been without challenges. As SDSU did not have the financial, space, or personnel resources to disseminate programs after the funding period, SPARK was licensed to a corporate partner that was purchased later by a much larger company. The business world is very competitive. To survive, companies need to ensure shareholders make a profit; as such, business people and educators do not always agree on priorities (e.g., hiring graphic design and marketing people vs. staff developers). Hiring, training, and retaining staff is impacted by competitive pricing, market turndowns, and retirements, and the loss of quality people who were part of SPARK for 15 or more years has been particularly challenging.

In the ever-changing world that now relies heavily on electronic media, SPARK has been required to adopt diverse dissemination strategies. These include numerous ways of communicating with PE instructors, principals, district officials, parent groups, health entities, and government agencies. Among them are presentations, activity demonstrations, and displays at diverse conferences; advertising in targeted publications and catalogs; a SPARK website; invitations to school staff to observe training at nearby schools; and personal contacts and word-of-mouth referrals. There are substantial challenges to the adoption of evidence-based programs, including lack of interest by school administrators and the costs of staff development (Lounsbery et al., 2011). Seeing enthusiastic teachers being trained in SPARK only to have their efforts blocked at schools because of lack of administrative support is especially disconcerting. Meanwhile, maintenance strategies continue to be developed, and these include schools and teachers receiving completion certificates, a quarterly newsletter, and on-line support materials. New strategies also include the development and testing of SPARKecademy.org, a professional development resource launched in 2015 that provides online training modules, webinars, and webcasts and permits members to track their professional development hours and access the training library through the SPARKecademy app.

Concluding Comments

The success that SPARK has accrued is far beyond anything we could imagine when we submitted the first grant proposal to NIH in 1988. Since then, the quality of the research, diverse curricula, and the instructional and dissemination strategies have been widely recognized, and the awards, honors and recognition from different government and health entities are too numerous to be listed here (see http://www.sparkpe.org/what-is-spark/awards/). In response to this recognition, SPARK provides a model for giving back by engaging in PE and physical activity advocacy efforts such as offering free webinars, newsletters, conference workshops, sample materials, and a grant finder site. It also sponsors the SHAPE America Teacher of the Year program, and in 2015 celebrated National Physical Fitness and Sport Month by teaming with *Let's Move! Active Schools* so that each school enrolling during May was entered into a drawing to win SPARK curricular packages.

Meanwhile, and in summary, as the problems associated with sedentary living abound, there is still need for the continued development and widespread use of evidence-based PE and physical activity programs (Sallis, McKenzie, Beets, Beighle, Erwin, & Lee, 2012). The SPARK programs, which were developed along the lines of the HOPE model for curriculum and instruction (Metzler et al., 2013a, 2013b), have been subjected to numerous scientific tests and are among only a few evidence-based programs to have been disseminated nationally and beyond. Additional programs need to be developed and assessed, and when proven effective, should be made available to others. The physical activity and health of children are too important to leave to chance, which is why we have maintained our commitment to developing, promoting, and disseminating

evidence-based interventions for nearly three decades. The procedures used in developing, assessing, and disseminating SPARK may serve as models for other researchers, particularly those interested in disseminating their programs through staff development and the provision of multiple options for accessing curricula.

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