

The Physical Educator

(ISSN print: 0031-8981; online: 2160-1682)
(USPS 431-220)

of Phi Epsilon Kappa

THE OFFICIAL PUBLICATION OF
PHI EPSILON KAPPA FRATERNITY

Editor

Thomas H. Sawyer, Ed.D.
NAS Fellow, AAHPERD Honor Fellow
Professor Emeritus, Kinesiology, Recreation, and Sport
Indiana State University
thomas.sawyer@indstate.edu

Associate Editor

Tonya L. Sawyer, Ph.D.
Compliance Coordinator
Department of Intercollegiate Athletics, Indiana State University
tonya.gimbert@indstate.edu

Editorial Review Board

Dr. Daniel Bart	Dr. Lawrence W. Judge	Dr. Jesse Rhoads
Dr. Kathryn Berlin	Dr. Bomna Ko	Dr. Kevin Richards
Dr. Jason Bishop	Dr. Jennifer Krause	Dr. Gary Rushing
Dr. Glenna Bower	Dr. Richard J. LaRue	Dr. Jared A. Russell
Dr. Jeff M. Cherubi	Dr. Myung Ah Lee	Dr. Miriam Satern
Dr. Megan Chilson	Dr. Wenhao Liu	Dr. Susan Schwager
Dr. Michael J Diacin	Dr. John Liu	Dr. Nestor W. Sherman
Dr. Robert Doan	Dr. Julieanne K. Maeda	Dr. C. Craig Stewart
Dr. Heather Erwin	Dr. Murray F. Mitchell	Dr. Ann-Catherine Sullivan
Dr. Tonya Sawyer	Dr. Hyun-Ju Oh	Dr. Carla Vidoni
Dr. Kathy Ginter	Dr. Anthony Parish	Dr. David Wachob
Dr. Grant Hill	Dr. Tom Parry	Dr. Jin Wang
Dr. Mathew Hutchins	Dr. Melanie Perrault	Dr. Elizabeth Wanless
Dr. Julia Ann Hypes	Dr. Jeffrey C. Petersen	Dr. Doris Watson
Dr. Michael Hypes	Dr. David Pierce	Dr. Linda Watson
Dr. Jayne M Jenkins	Dr. Lisa Pleban	Dr. Heidi Wegis
Dr. Darrell L. Johnson	Dr. Jay Polsgrove	Dr. Amelia Mays Woods
Dr. James E Johnson	Dr. Penny Portman	Dr. Furong Xu
Dr. Dennis Johnson	Dr. Bonnie Reimann	Dr. John Zody

Phi Epsilon Kappa



THE PHYSICAL EDUCATOR

Spring 2015

Volume 72, Number 2

CONTENTS

Effect of Frequent Peer-Monitored Testing and Personal Goal Setting on Fitnessgram Scores of Hispanic Middle School Students

Grant Hill and Aaron Downing..... 193

Validity and Responsiveness of Concept Map Assessment Scores in Physical Education

Yun Soo Lee, Yongkyu Jang, Minsoo Kang... 206

Active and Healthy Schools

*Stephen Ball, Jessica Kovarik,
Heather Leidy*..... 224

Effects of Music on Physical Activity Rates of Elementary Physical Education Students

David Barney and Keven A. Prusak..... 236

Effects of a Peer-Administered Token Economy on Second Grade Physical Education Students' Overhand Throw Performance

Andrew E. Alstot..... 245

An Examination of In-Class Physical Activity Across Games Classifications

Dana J. Perlman and Greg Forrest..... 266

Identifying High School Physical Education Physical Activity Patterns After High School

*David Barney, Francis T. Pleban,
Carol Wilkinson, Keven A. Prusak*..... 278

Impact of Physical Educators on Local School Wellness Policies

*Matthew T. Buns and
Katherine T. Thomas*..... 294

Kinesiology Career Club: Undergraduate Student Mentors' Perspectives on a Physical Activity-Based Teaching Personal and Social Responsibility Program

*David S. Walsh, Maria J. Veri,
Jason J. Willard*..... 317

Secondary School Students' Physical Activity Participation Across Physical Education Classes: The Expectancy-Value Theory Approach

*Arto Gråstén, Anthony Watt, Martin Hagger,
Timo Jaakkola, Jarmo Liukkonen*..... 340

Instructions for Authors..... 359

Views and opinions expressed in the articles appearing in THE PHYSICAL EDUCATOR are those of the authors and not necessarily those of the Editor, the Editorial Board, or Phi Epsilon Kappa Fraternity.

THE PHYSICAL EDUCATOR (Print ISSN: 0031-8981, Ejournal ISSN: 2160-1682) is published four times a year in the spring, fall, early winter, and late winter by Sagamore Publishing, 1807 N. Federal Drive, Urbana, IL 61801.

POSTMASTER: Send address changes to *The Physical Educator*, Sagamore Publishing, 1807 N. Federal Drive, Urbana, IL, 61801.

The Phi Epsilon Kappa web page is located at <http://www.phiepsilonkappa.org>

Editorial Office

Thomas H. Sawyer, Ed.D., Editor
5840 S. Ernest Street
Terre Haute, IN 47802

Subscription Office

Sagamore Publishing LLC
1807 N. Federal Drive
Urbana, IL 61801

Domestic Institution/Library: \$330.00 (print and online)
International Institution/Library: \$370.00 (print and online)
Domestic Individual: \$100.00 (print and online)
International Individual: \$120.00 (print and online)

Average number of copies printed per issue (net press run) during the preceding 12 months is 5374; number of copies nearest to filing date is 1265. Average number of copies of each issue distributed in mass mailing to subscribers during the preceding 12 months is 4780; number of copies nearest to filing date is 1169. Average number of copies of each issue distributed free during the preceding 12 months is 60; number of copies nearest to filing date is 13.

Send address correspondence concerning subscriptions and change of address to Membership/Subscription Department, *The Physical Educator*, Sagamore Publishing, 1807 N. Federal Drive, Urbana, IL 61801. Make check or money order payable to Sagamore Publishing, order online at www.sagamorepublishing.com, or call 800-327-5557.

Copyright © 2015 by Phi Epsilon Kappa Fraternity. All rights reserved.

ASSESSMENT

Effect of Frequent Peer-Monitored Testing and Personal Goal Setting on Fitnessgram Scores of Hispanic Middle School Students

Grant Hill and Aaron Downing

Abstract

The purpose of this study was to determine the effects of frequent peer-monitored Fitnessgram testing, with student goal setting, on the PACER and push-up performance of middle school students. Subjects were 176 females and 189 males in 10 physical education classes at a middle school with an 83.7% Hispanic student population. Students were baseline fitness tested with five classes assigned to the control group and five to the experimental group with no significant differences between the two groups in baseline fitness test performance. Students in the experimental group set personal goals and participated in peer fitness testing four times over the next 18 weeks. Results from formal teacher testing at the end of 18 weeks using MANOVA demonstrated that placement in the experimental group had no effect on pre- versus posttest scores for PACER and push-up tests compared with the control group. Students in control and experimental groups also completed the PAQ-A, with results indicating a significant positive correlation of higher weekly activity levels with push-up scores, but no significant difference for weekly activity levels and PACER scores. Results are discussed in terms of Locke's goal setting theory as well as recent research pertaining to youth fitness testing.

Grant Hill is a professor in the Department of Kinesiology, California State University, Long Beach. Aaron Downing is a physical educator at Lake Center Middle School in Santa Fe Springs, CA. Please send author correspondence to Grant Hill, Department of Kinesiology, California State University, Long Beach, 1250 Bellflower Blvd., Long Beach, CA 90840. E-mail: ghill@csulb.edu

Fitness testing has been a part of most K–12 physical education (PE) programs since the creation of the President’s Council on Physical Fitness during the 1950s (Morrow, Weimo, Franks, Meredith, & Spain, 2009). Fitnessgram is one of the most frequently implemented youth fitness test programs in the United States (Keating & Silverman, 2004). Since 1995, California state law has required students in the fifth, seventh, and ninth grades in public schools to take the Fitnessgram, which has been used to reflect California students’ health-related fitness profile (California Department of Education, 2003). Fitnessgram includes six subtests: sit and reach, skinfold measurement, PACER/mile run, push-ups, curl-ups, and shoulder stretch. In the state of California, fitness testing has become a high-stakes process wherein 10th grade students who do not achieve scores in the healthy zone in at least five out of six of the fitness subtests are required to take 2 additional years of PE, or each semester until they pass at least five of the six subtests (California Department of Education, 2012).

Wiersma and Sherman (2008) stated that when physical fitness testing is conducted in a motivating manner, it increases internal validity, self-efficacy, enjoyment, and overall interest in physical activity (PA) and that self-assessment is a viable means to increase competence in fitness performance. In contrast, Corbin (2009) argued that fitness test scores are related to factors other than fitness promotion strategies that may be employed in a school PE class. The Ontario Physical and Health Education Association (OPHEA, 2006) stated that since children mature at different rates, fitness test results are largely determined by physical maturity. In a feasibility study commissioned by the National Assembly for Wales (Cale & Harris, 2009), the value of fitness testing on promoting healthy lifestyles and PA was questioned, and Morrow and Freedson (1994) found a low relationship between fitness scores and PA among youth. Corbin (2002) stated that for elementary and middle school students, fitness test scores are difficult to predict from PA patterns. Consequently, any intervention in a PE class alone will unlikely result in major changes in physical fitness scores over the short term.

Harris and Cale (2007) and Rice (2007) warned that fitness testing may contribute to a diminished interest in PE and PA in general because the results undermine the confidence, self-esteem, and sense of self as a PA participant for those who either have low scores or do not experience improvement. Others (Cale, Harris, & Chen, 2007; Rice, 2007; Rowland, 1995) have called for an end to fit-

ness testing in schools altogether because they perceive it does more harm than good as it is time consuming, embarrassing to students, and not effective in promoting PA.

Because of the apparent controversy regarding the value of fitness testing, a study was deemed necessary to determine whether a specific intervention would be effective in increasing Fitnessgram PACER and push-up scores of seventh and eighth grade students in a school with a primarily Hispanic population over 18 weeks. The specific intervention was to provide frequent peer-monitored fitness testing with student-generated goal setting after each test. In this study, PACER and push-up scores of seventh and eighth grade male and female students in required PE classes who engaged in peer-monitored fitness testing and goal setting four times over 18 weeks were compared with the scores of students in a control group to determine whether either group showed significantly greater improvements in fitness scores. The results of this study are considered to be important in determining whether increasing the frequency of fitness testing with student goal setting is an effective strategy to improve youth fitness scores.

Goal setting is a positive motivational strategy that is designed to improve performance (Burton, 1992). Goal setting has been found to be effective in improving long-term self-motivation through eliciting commitment, perseverance, dedication, and effort. Goals tend to provide a focus and direction for a person's activity and permit an individual to measure performance continuously through internal processes of comparison using subjective standards to evaluate ongoing pursuits (Locke & Latham, 1990). Locke, Shaw, Saari, and Latham (1981) reviewed 110 workplace studies and concluded that 99 of them reported findings supportive of his theory that specific, difficult goals lead to higher levels of task performance than "do-your-best" goals, easy goals, or no goals. Mento, Cartledge, and Locke (1980) and Tubbs (1986) also found increased performance and productivity associated with specific goal setting. However, the effectiveness of goal setting in a sport and exercise setting has been tested in few studies (Annesi, 2002), and generally, studies on the influence of goal setting on performance of a physical skill have resulted in inconsistent findings (La Clair, 1994). Shilts, Horowitz, and Townsend (2004), in reviewing research related to the effectiveness of goal setting in regard to improving nutrition and PA practices, found that no studies had been conducted with middle school adolescents. They also stated that attempting to change the dietary

and PA behaviors of youth aged 12 to 14 years through self-set goals may be theoretically futile because children this young have not yet developed the ability to think logically about abstractions. Consequently, in this research, an issue that has not been previously examined is addressed: whether frequent peer-monitored fitness testing with student goal setting is an effective strategy to improve middle school fitness test scores.

Methods

Ten PE classes in a Southern California middle school with 176 females and 189 males aged 12 to 14 participated in the study. The published ethnic percentages for this school were 83.7% Hispanic, 6.1% Caucasian, 1.8% African American/Black, 1.2% Asian, and 7.2% Other or Unreported. Approximately 67% of the students in this school were reported as eligible to receive free or subsidized meals. Approval was secured from the district review board, and informed consent was obtained from parents of the participants. One PE teacher arbitrarily designated three classes to be in the experimental group and two classes to be in the control group. Another PE teacher designated two classes to be in the experimental group and three classes to be in the control group. The two teachers had taught at the same school for the past 3 years and reviewed testing procedures to ensure consistency in administering the test items. Students in the control and experimental groups were formally tested by their teachers during the first week of the semester to establish baseline fitness scores for the 20-m PACER and push-up tests using testing procedures as specified in *Fitnessgram* (The Cooper Institute, 2010). Students in the experimental group subsequently completed the PACER and push-up tests in small groups every 3 to 4 weeks for the remainder of the semester (i.e., four peer-monitored tests). In addition to recording their own scores, students in the experimental classes set personal goals for their next test performance. Students entered their self-report scores on sheets collected by the instructors after each test. Those sheets were returned to students during each subsequent peer-monitored test so they could view their goals and progress. Six units, each approximately 3 weeks in length, were offered during the semester: flag rugby, tumbling, paddle tennis, football, soft lacrosse, and softball. At the end of the 18 weeks, students in the control and experimental groups were again formally tested by the teachers. At the end of 18 weeks, students in the control and experimental classes completed the Physical Activity Questionnaire

for Adolescents (PAQ-A), which indicates the frequency, duration, and type of PA in which the students have recently engaged (Kowalski, Crocker, & Donen, 2004). A MANOVA was used to determine if there were differences in PACER and push-up performance between the control and experimental groups for the pre- and posttests. The researchers conducted *t* tests to determine whether there were differences between the final self-report test and final PACER and push-up scores for the experimental group. An ANOVA was conducted to determine whether students with higher scores on the PACER and push-up tests also reported higher frequencies of PA using the PAQ-A.

Results

Through the MANOVA, it was demonstrated that whether students were placed in a control group or an experimental group had no effect on their pre- and posttest scores for the PACER and push-up tests ($p < .01$). In some cases, students in the control group had significant improvements between pre- and posttest scores, and in other cases, students in the experimental groups had significant improvements between pre- and posttest scores (see Tables 1 and 2). The means for the final peer-monitored push-up test and the final teacher-administered push-up test were very similar ($M = 15.69$, $SD = 6.41$; $M = 15.96$, $SD = 7.07$), and the Pearson product-moment coefficient indicated a significant correlation ($r = 0.50$, $p < .000$). The means of the final PACER peer-monitored test ($M = 14.41$, $SD = 4.37$) and final teacher-administered PACER test ($M = 23.99$, $SD = 11.7$) were also significantly correlated ($r = 0.354$, $p < .000$). Through the ANOVA, no significant differences were demonstrated between the control and experimental groups in regard to number of weekly activities (Item 1), effort and intensity of activity (Items 2 to 7), and frequency of daily activity (Item 8) reported by students ($p < .01$; see Table 3). Based on the responses of students by gender, no significant differences for any of the PAQ-A items were revealed ($p < .01$). However, students who reported the greatest frequency of daily PA (PAQ-A Item #8) achieved significantly higher scores on the push-up test (see Table 4). A comparison of the final push-up and PACER scores with PAQ-A Item 8 yielded low (0.12, .11), nonsignificant positive Pearson product-moment correlations.

Table 1
Means and Standard Deviations of Push-Up and PACER Scores for Middle School Experimental and Control Groups by Gender

Groups	Push-ups		PACER	
	Pretest	Posttest	Pretest	Posttest
Experimental				
Boys (<i>n</i> = 79)	17.36 (8.58)	17.92 (7.05)	25.76 (11.46)	28.18 (13.67)*
Girls (<i>n</i> = 72)	12.60 (5.49)	14.50 (6.48)*	19.32 (5.80)	19.94 (7.27)
Control				
Boys (<i>n</i> = 112)	15.81 (7.82)	18.79 (8.11)*	21.39 (10.88)	24.77 (13.24)*
Girls (<i>n</i> = 90)	14.06 (6.91)	14.81 (6.47)	17.45 (7.23)	20.57 (8.44)

*Posttest score significantly greater than pretest score, *p* < .01.

Table 2
Means and Standard Deviations of Push-Up and PACER Scores for Middle School Experimental and Control Groups by Grade Level

Groups	Push-ups		PACER	
	Pretest	Posttest	Pretest	Posttest
Experimental				
6th (<i>n</i> = 46)	15.55 (8.09)	17.07 (8.48)	20.60 (5.37)	18.47 (5.94)
7th (<i>n</i> = 51)	12.98 (5.99)	14.33 (6.21)	20.67 (9.33)	23.37 (11.83)*
8th (<i>n</i> = 57)	16.13 (8.05)	17.07 (5.98)	25.44 (11.45)	28.76 (12.73)*
Control				
6th (<i>n</i> = 41)	15.49 (8.65)	18.49 (9.70)*	14.53 (5.43)	17.47 (6.38)*
7th (<i>n</i> = 91)	12.46 (6.55)	15.66 (6.30)	24.11 (11.30)	27.92 (13.92)*
8th (<i>n</i> = 77)	17.85 (6.73)	17.73 (7.72)	16.31 (5.04)	18.98 (5.79)

*Posttest score significantly greater than pretest score, *p* < .01.

Table 3
Means and Standard Deviations of Reported Physical Activity Levels for Experimental and Control Groups Using PAQ-A

PAQ item #	Experimental	Control	<i>p</i>
Number of activities in past week (PAQ Item 1)	1.79 (0.68)	1.78 (0.69)	0.90
Effort and intensity (PAQ composite Items 2–7)	3.01 (0.89)	3.07 (0.94)	0.60
Frequency of daily activity (PAQ Item 8)	2.72 (1.01)	2.83 (1.17)	0.38

Note. No significant differences found between experimental and control group scores (*p* < .01).

Table 4

Means and Standard Deviations of Push-Up and PACER Scores of Students Who Reported Various Frequencies of Physical Activity Using the Physical Activity Questionnaire for Adolescents (PAQ-A)

Student reported frequency of daily activity (PAQ Item 8)	Push-ups	PACER laps
1 - None (43)	16.2 (8.4)	21.1 (11.0)
2 - Little bit (90)	15.4 (5.6)	22.3 (11.6)
3 - Medium (109)	15.9 (6.9)	22.9 (10.8)
4 - Often (64)	17.6 (6.7)	26.1 (11.8)
5 - Very often (22)	20.4 (8.5)*	23.3 (10.5)

*Significant differences for push-ups based on frequency of daily activity level at .01 level. Group 5 > than Groups 1, 2, and 3.

Discussion

The results indicate that frequent peer-monitored fitness testing with goal setting as an 18-week intervention strategy does not positively impact posttest PACER or push-up test scores for middle school boys or girls. Specifically, students in the control group experienced equal or greater gains compared to students in the experimental group in PACER and push-up scores. These findings appear to support the results of the feasibility study that was commissioned by the National Assembly for Wales, through which the value of increasing class time spent on fitness testing was questioned (Cale & Harris, 2009).

For several reasons, the students in the experimental group did not experience greater gains in push-up and PACER scores than students in the control group. First, students in the experimental group may have disliked or resented using PE time for fitness testing because they found it boring or embarrassing (Silverman, Keating, & Phillips, 2008). This may partially explain the moderate correlations between the experimental group’s self-test and final teacher-administered test scores. Specifically, students in the experimental group may have performed below their ability level during the peer-monitored testing sessions due to a lack of motivation (Domangue & Solmon, 2010; Mahar & Rowe, 2008). Second, differences in group dynamics within specific classes may have affected the scores (e.g., the means in the PACER and push-up tests were significantly higher for the sixth grade boys than seventh grade boys in the control and

experimental groups). Third, given the similarity between the experimental and control groups PAQ-A scores, it appears as if the students in the experimental group were not motivated to be more physically active than students in the control group, despite the frequent peer-monitored fitness testing (Cale et al., 2007). Fourth, given the significant improvements in push-up and PACER scores for boys in the control group, it appears as if physical maturation over the 18 weeks may have played a more important role improving test scores than the intervention (Lloyd, Colley, & Tremblay, 2010).

These findings do not appear to support Locke's theory of goal setting, although Locke's research was primarily in industrial and organizational settings with adults (Weinberg, 1994). In addition, the goals the students set may not have been taken seriously or realistic because no incentive was provided for reaching those goals. The students may have also been too young to formulate realistic, motivating goals that would change their dietary and PA behaviors (Shilts et al., 2004). It is also possible that the students in the control groups informally set their own goals for the final fitness test based on their initial score (Correa & Souza, 2009). The effectiveness of the goal setting may also have been limited because the students in the experimental groups had reached the limits of their physical ability (Weinberg, 1994). In addition, according to Weinberg (2010), just setting goals does not ensure improvements in performance or productivity—certain principles and guidelines should be followed to maximize their effectiveness. The students in the experimental group of this study wrote specific and measurable goals, but those goals may not have been realistic and the students may not have formulated specific plans to reach their goals.

It is not surprising that males in both groups scored higher than their female counterparts in the push-up and PACER tests. This finding is consistent with Fitnessgram gender standards, which require males to score higher in all categories than females to reach the Healthy Fitness Zone. Males typically perform better on the push-up test than females due to genetic strength and maturation (The Cooper Institute, 2010).

Notably, students who reported the highest frequency of daily PA scored significantly higher on the push-up test, but no significant differences were found for the PACER test. However, because correlations between student-reported weekly activity (PAQ-A) and push-up and PACER test results were extremely low, these results provide only partial evidence that weekly PA is a primary factor pre-

dicting fitness score performance, findings that are congruent with those of Morrow and Freedson (1994) and others who have reported low correlations between adolescent PA levels and fitness test scores (Armstrong & Welsman, 1997; Cale & Harris, 2009; Cale et al., 2007). The results also appear to affirm Corbin (2009), who stated it is difficult to predict youth fitness scores from PA patterns for elementary and middle school students.

Conclusions and Recommendations

The results of this study are consistent with those of previous studies in which the researchers found a low correlation between youth fitness test scores and reported PA levels (Armstrong & Welsman, 1997; Cale & Harris, 2009; Cale et al., 2007). The participants in this study were primarily Hispanic; the results should not be generalized to other ethnic groups since physical activity levels and fitness scores for middle school-aged students have been found to be dissimilar among ethnic and socioeconomic groups (Grieser et al., 2008; Fahlman, Hall, & Lock, 2006; Hoelscher, Barroso, Springer, Castrucci, & Kelder, 2009; Yoo, Lounsbery, Bungum, & Gast, 2010). In addition, the validity of self-report measures of PA have been shown to have limited validity among children (Pate, 1993). A more accurate measure of weekly PA may have been realized through the use of pedometers or accelerometers (Kelly et al., 2010).

Rather than spending increased time in PE classes for fitness testing, it appears to be more important to use class time to help students engage in moderate to vigorous PA and identify ways to increase their daily PA levels (Cale & Harris, 2009; Pangrazi, 2000). In regard to goal setting, rather than having middle school students set their own fitness test goals, it may be more productive to have them use “guided goal setting,” which involves having them choose from a variety of goals that the instructor has developed (Shilts et al., 2004). In addition, students should also be required to formulate specific plans to increase their activity levels specific to the Fitnessgram component tests (Weinberg, 2010). Middle school teachers should find ways to reinforce student achievement that is focused on their personal activity plans. It also appears important to inform PE teachers that it is not until adolescence that regular PA begins to override heredity, maturation, and age as primary factors affecting fitness test scores (Pangrazi & Corbin, 2008; Wrench & Garrett, 2008).

Since the link between fitness scores and healthy lifestyle is not causal, PE teachers should strive offer comprehensive curriculums

that are focused on addressing state and/or national standards in PE as opposed to narrowly seeking to justify the value of their programs by student fitness test scores (Wrench & Garrett, 2008). This may be challenging given that program accountability for PE programs appears to be linked to improving student fitness test scores. However, if students are given opportunities to master sport-related motor skills, it should positively impact their self-efficacy, which should make them more likely to participate in independent PA (Chase, 2001).

Future research should be focused on identifying the most salient ways to motivate students to increase their PA levels, particularly during the elementary school years. Since PA levels have been shown to decrease with age, particularly among females, it also appears to be important to identify specific reasons why students lose motivation to be physically active (Salvy et al., 2009).

References

- Annesi, J. J. (2002). Goal-setting protocol in adherence to exercise by Italian adults. *Perceptual and Motor Skills*, 94, 453–458.
- Armstrong, N., & Welsman, J. (1997). *Young people and physical activity*. Oxford, England: Oxford University Press.
- Burton, D. (1992). The Jeckyl/Hyde nature of goals: Reconceptualizing goal setting in sport. In T. S. Horn (Ed.), *Advances in sport psychology* (pp. 267–297). Champaign, IL: Human Kinetics.
- Cale, L., & Harris, J. (2009). Fitness testing in physical education: A misdirected effort in promoting healthy lifestyles and physical activity? *Physical Education & Sport Pedagogy*, 14(1), 89.
- Cale, L., Harris, J., & Chen, M. (2007). More than 10 years after “The Horse is Dead...”: Surely it must be time to “Dismount”?! *Pediatric Exercise Science*, 19, 115–131.
- California Department of Education. (2003). Physical fitness testing. Retrieved January 16, 2012, from <http://www.cde.ca.gov/ta/tg/pf/>
- California Department of Education. (2012, February 17). Questions and answers regarding high school physical education exemptions. Retrieved from <http://www.cde.ca.gov/ta/tg/pf/pftqanda.asp>

- Chase, M. A. (2001). Children's self-efficacy, motivational intentions, and attributions on physical education & sport. *Research Quarterly for Exercise & Sport*, 72, 47–61.
- The Cooper Institute. (2010, July 7). Fitnessgram/Activitygram. Retrieved from <http://www.cooperinstitute.org>
- Corbin, C. (2002). Physical activity for everyone: What every physical educator should know about promoting physical activity. *Journal of Teaching in Physical Education*, 21, 128–144.
- Corbin, C. (2009). Appropriate uses of physical fitness tests. *The CAHPERD Journal*, 72(1), 20–26, 40.
- Correa, U., & Souza, O. (2009). Effects of goal difficulty and temporality in motor skill acquisition using the bachman ladder. *Perceptual and Motor Skills*, 109(3), 817–823.
- Domangue, E., & Solmon, M. (2010). Motivational responses to fitness testing by award status and gender. *Research Quarterly for Exercise & Sport*, 81(3), 310.
- Fahlman, M., Hall, H., & Lock, R. (2006). Ethnic and socioeconomic comparisons of fitness, activity levels, and barriers to exercise in high school females. *Journal of School Health*, 76(1), 126.
- Grieser, M., Neumark-Szteainer, D., Saksvig, B., Lee, J., Felton, G., & Kubiki, M. (2008). Black, Hispanic, and White girls' perceptions of environmental and social support and enjoyment of physical activity. *Journal of School Health*, 78(6), 314.
- Harris, J., & Cale, L. (2007). Children's fitness testing: A feasibility study. *Health Education Journal*, 66(2), 153–172.
- Hoelscher, D., Barroso, C., Springer, A., Castrucci, B., & Kelder, S. (2009). Prevalence of self-reported activity and sedentary behaviors among 4th, 8th, and 11th grade Texas public school children: The School Physical Activity and Nutrition Study. *Journal of Physical Activity & Health*, 6(5), 535–547.
- Keating, X. D., & Silverman, S. (2004). Teachers' use of fitness tests in school-based physical education programs. *Measurement in Physical Education and Exercise Science*, 8(3), 145–165.
- Kelly, E. B., Parra-Medina, D., Pfeiffer, K. A., Dowda, M., Conway, T. L., Webber, L. S., . . . Pate, R. R. (2010). Correlates of physical activity in Black, Hispanic, and White middle school girls. *Journal of Physical Activity, and Health*, 7, 184–193.

- Kowalski, K. C., Crocker, P. R. E., & Donen, R. M. (2004). *The Physical Activity Questionnaire for Older Children (PAQ-C) and Adolescents (PAQ-A) manual*. Saskatoon, Canada: College of Kinesiology University of Saskatchewan.
- La Clair, K. W. (1994). *The influence of goal setting on individual endurance swimming performance* (Master's thesis). Retrieved from <http://himpubs.uoregon.edu/>
- Lloyd, M., Colley, R., & Tremblay, M. (2010). Advancing the debate on 'fitness testing' for children: Perhaps we're riding the wrong animal. *Pediatric Exercise Science*, 22(2), 176.
- Locke, E. A., & Latham, G. P. (1990). *A theory of goal setting and performance*. Englewood Cliffs, NJ: Prentice Hall.
- Locke, E. A., Shaw, K. N., Saari, L. M., & Latham, G. P. (1981). Goal setting and task performance: 1969–1980. *Psychological Bulletin*, 90, 125–152.
- Mahar, M., & Rowe, D. (2008). Practical guidelines for valid and reliable youth fitness testing. *Measurement in Physical Education and Exercise*, 12(3), 126–145.
- Mento, A., Cartledge, N., & Locke, E. (1980). Maryland vs. Michigan vs. Minnesota: Another look at the relationship of expectancy and goal difficulty to task performance. *Organizational Behavior and Human Performance*, 25, 419–440.
- Morrow, J., & Freedson, P. (1994). Relationship between habitual physical activity and aerobic fitness in adolescents. *Pediatric Exercise Science*, 6, 315–329.
- Morrow, J., Weimo, Z., Franks, B., Meredith, M., & Spain, C. (2009). 1958–2008: 50 years of youth fitness tests in the United States. *Research Quarterly for Exercise & Sport*, 80(1), 1.
- Ontario Physical and Health Education Association. (2006). The purpose of fitness assessment in a quality health and physical education program: Six key messages developed by OASPHE. Retrieved January 23, 2012, from <http://www.ophea.net>
- Pangrazi, R. (2000). Promoting physical activity for youth. *Australian Council for Health, Physical Education, Recreation, and Healthy Lifestyles Journal*, 47(2), 18–21.
- Pangrazi, R., & Corbin, C. (2008). Factors that influence physical fitness in children and adolescents. In G. Welk & M. Meredith (Eds.), *Fitnessgram/Activitygram reference guide* (pp. 52–60). Dallas, TX: The Cooper Institute.

- Pate, R. R. (1993). Physical activity assessment in children and adolescents. *Critical Review Food Science Nutrition*, 33(4), 321–326.
- Rice, C. (2007) Becoming “the fat girl”: Acquisition of an unfit identity. *Women’s Studies International Forum*, 30, 158–174.
- Rowland, T. W. (1995) The horse is dead; let’s dismount. *Pediatric Exercise Science*, 7, 117–120.
- Salvy, S., Roemmich, J., Bowker, J., Romero, N., Stadler, P., & Epstein, L. (2009). Effect of peers and friends on youth physical activity and motivation to be physically active. *Journal of Pediatric Psychology*, 34(2), 217–225.
- Shilts, M. K., Horowitz, M., & Townsend, M. S. (2004). Goal setting as a strategy for dietary and physical activity behavior change: A review of the literature. *American Journal of Health Promotion*, 19, 81–93.
- Silverman, S., Keating, X. D., & Phillips, S. R. (2008). A lasting impression: A pedagogical perspective on youth fitness testing. *Measurement in Physical Education and Exercise Science*, 12, 146–166.
- Tubbs, M. E. (1986). Goal setting: A meta-analytic examination of the empirical evidence. *Journal of Applied Psychology*, 71, 474–483.
- Weinberg, R. (1994). Goal setting and performance in sport and exercise settings: A synthesis and critique. *Medicine & Science in Sports & Exercise*, 26(4), 469–477.
- Weinberg, R. (2010). Making goals effective: a primer for coaches. *Journal of Sport Psychology in Action*, 1, 57–65.
- Wiersma, L. D., & Sherman, C. P. (2008). The responsible use of youth fitness testing to enhance student motivation, enjoyment, and performance. *Measurement in Physical Education and Exercise Science*, 12, 167–183.
- Wrench, A., & Garrett, R. (2008). Pleasure and pain: Experiences of fitness testing. *European Physical Education Review*, 14(3), 325–346.
- Yoo, S., Lounsbery, M., Bungum, T., & Gast, J. (2010). Adolescent gender and ethnicity differences in physical activity perceptions and behavior. *Journal of Physical Activity & Health*, 7(6), 770–775.

ASSESSMENT

Validity and Responsiveness of Concept Map Assessment Scores in Physical Education

Yun Soo Lee, Yongkyu Jang, Minsoo Kang

Abstract

*Concept map assessment has been applied to many education areas to measure students' knowledge structure. However, the proper and valid use of concept map assessment has not been examined in physical education. The purpose of this study was to evaluate the evidence of validity and responsiveness of the concept map assessment scores in physical education teacher education (PETE) programs. Concept map data were collected from 56 students. Two raters independently scored concept maps using structural method and relational method. Intraclass correlation coefficient (ICC) was used to examine interrater reliability. Independent *t* tests and paired *t* tests were used to examine validity and responsiveness. High level of reliability was seen between two raters ($ICC = .946-.985$). The results of this study provided the evidence of validity and responsiveness. Concept map assessment reflects expected difference between the groups and the change in students' knowledge structure over time. In conclusion, the feasibility of the concept map assessment in PETE was identified in this study.*

Yun Soo Lee is an assistant professor, Department of Physical Education, Dankook University. Yongkyu Jang is a professor, Department of Physical Education, Seoul National University of Education. Minsoo Kang is a professor, Department of Health and Human Performance, Middle Tennessee State University. Please send author correspondence to Yun Soo Lee, Department of Physical Education, College of Education, Dankook University, Yongin, South Korea. E-mail: yslee@dankook.ac.kr

Providing high-quality education and training to teacher candidates in teacher education programs is important. In 2008, for example, the National Association for Sport and Physical Education (NASPE) proposed national standards for initial physical education teacher education (PETE) to establish high-quality PETE programs in the United States. Teacher candidates in PETE programs need to be provided with acceptable knowledge, skills, and dispositions (National Council for Accreditation of Teacher Education [NCATE], 2008). PETE programs also need to be evaluated using the standards (e.g., NASPE, NCATE) that were adopted for the program. Consequently, it becomes necessary to assess teacher candidates' knowledge and skills using valid and reliable assessment tools.

Traditionally, teacher educators have used a variety of assessments to measure teacher candidates' knowledge and skills. One of the most widely used assessment tools is a written test (Lund & Kirk, 2002), which comprises short-answer questions, multiple-choice questions, essay questions, matching questions, true-false questions, classification questions, and rearrangement questions. Journals, lesson planning, projects, and portfolios are also often used as assessment tools in teacher education programs (Lund & Kirk, 2002). However, these traditional assessments have limitations for assessing teacher candidates' knowledge. First, these tools are used to assess only limited and lower order knowledge (e.g., remembering and comprehension). Second, it takes much time to assess and grade teacher candidates' in-depth knowledge. For these reasons, teacher educators are in need of new and better ways to assess teacher candidates' knowledge.

Concept map assessment is an alternative way of assessing teacher candidates' knowledge structure. A concept map is a diagram "to represent meaningful relationships between concepts in the form of propositions" (Novak & Gowin, 1984, p. 15). Concept maps include main ideas (i.e., key concepts) that are enclosed in circles with arrows to connect one concept (i.e., one circle) to another. On the arrow lines, there are linking words or phrases to explain the relationship between the two concepts. Propositions are developed in concept maps, including two or more concepts with linking words or phrases to make a meaningful statement (Novak & Cañas, 2008). Joseph Novak developed concept maps in his research program at Cornell in 1972 (Novak & Cañas, 2008). This research program was based on David Ausubel's (1968) cognitive psychology theory (as cited in Novak & Cañas, 2008), of which the principle concept is

that “learning takes place by the assimilation of new concepts and propositions into existing concepts and propositional frameworks held by the learner” (Novak & Cañas, 2008, p. 3).

Concept map assessment is an effective tool to demonstrate an individual’s organization of knowledge and decision making (West, Pomeroy, Park, Gerstenberger, & Sandoval, 2000). It may also be used to measure teacher candidates’ abilities to apply, analyze, synthesize, and evaluate. It is simple and easy to teach teacher candidates to generate concept maps (McClure, Sonak, & Suen, 1999; Rice, Ryan, & Samson, 1998) and requires little time for teacher educators to grade them. An individual’s knowledge structure can be expanded with new knowledge plus existing knowledge (Novak & Cañas, 2008). As a result of the connections between new and existing knowledge, teacher candidates can gain a deeper understanding of the topic. Furthermore, the process can be repeated to show evidence of how teacher candidates are integrating new knowledge into existing concept maps.

Research on concept maps has been developed in science education, wherein researchers measure students’ knowledge by scoring the structure of the concept maps or the relationships among the concepts. McClure et al. (1999) established reliability, validity, and logistical practicality for concept map assessment using three scoring methods by comparing the students’ concept maps with a master map. They suggested that concept maps can be used to find unique and valuable information about students’ knowledge structure (McClure et al., 1999). Other researchers have tried to measure procedural knowledge as well as declarative knowledge using concept maps (Rice et al., 1998).

Shulman (1986) proposed his view of the knowledge for teaching (a) subject matter content knowledge (CK), (b) pedagogical content knowledge (PCK), and (c) curricular knowledge. Teacher educators in educational communities are interested in teacher knowledge and attempt to develop and assess teacher candidates’ knowledge effectively. Therefore, it is important to assess teacher candidates’ different knowledge accurately (e.g., CK, PCK, curricular knowledge) using different assessment tools. If teacher educators use concept maps as an alternative assessment tool, it would be beneficial to measure teacher candidates’ knowledge base for teaching that which Shulman described. The reason is because it takes little time for teacher educators to train teacher candidates and to score concept maps. It is also not difficult for teacher candidates to create concept maps in terms of time and skills.

Concept map assessment has been recommended for use in subject matters such as biology education (Pearsall, Skipper, & Mintzes, 1997), engineering education (Besterfield-Sacre, Gerchak, Lyons, Shuman, & Wolfe, 2004), science education (McClure & Bell, 1990; McClure et al., 1999; Rice et al., 1998; Ruiz-Primo & Shavelson, 1996; Rye & Rubba, 2002), medical education (Kassab & Hussain, 2010; West, Park, Pomeroy, & Sandoval, 2002; West et al., 2000), physics education (Austin & Shore, 1995), and physical education (PE; Ennis, Mueller, & Zhu, 1991; Mohammed, 2010; Rink, French, Lee, Solomon, & Lynn, 1994). However, the proper scoring methods of a concept map and the validity and responsiveness of concept map assessment have not been examined in PETE programs. The purpose of this study was to evaluate the evidence of validity and responsiveness of concept map assessment scores in PETE programs.

Method

Participants

The participants were 57 students (i.e., 31 students in Group A and 26 students in Group B) who were recruited from the PETE program at a university in the southeast region of the United States. A power analysis was performed prior to this research study based on West et al.'s (2000) data. Their concept map data were used, and test of difference between two independent means was selected to estimate sample size of this study. The results indicate that a sample size of 52 (26 in each group) is necessary, given the effect size of 0.92, alpha of .05, and the power of 0.90.

This study was approved by the institutional review board at this university. A written informed consent form was collected from each participant. The participants in Group A were students who were taking a course, Assessment in Physical Education, which is a senior-level course according to the sequence of the program. The participants in Group B were students who were taking Introduction for Teaching Physical Education, a sophomore-level course and an initial course for PE-related majors (e.g., health education, leisure and recreation, exercise science). Students in Group A were requested to complete two concept maps, and students in Group B were requested to complete one concept map. One student in Group A did not complete a second concept map, resulting in removal from further analysis. Therefore, 56 participants' data (i.e., 30 students in Group A and 26 students in Group B) were used in this study.

Setting

The participants completed concept map training and created a concept map about the topic, assessment in PE. This topic was selected because (a) the use of quality assessment is one of the important concepts that teacher candidates should obtain from a PETE program; (b) this topic is aligned with National Standard 5, impact on student learning (NASPE, 2008); and (c) the researcher is familiar with this topic to score concept maps accurately as a rater.

Instructions about assessment in PE were provided to only Group A using the course textbook (Lund & Veal, 2013). Using this textbook, students learned about key concepts related to assessment with a number of related activities to consolidate student understanding. The instructor taught key concepts of the assessment in PE. The participants in Group A read and completed all tasks in Chapters 1 to 14. The instructor provided examples about key concepts and showed how to develop assessment plans for PE classes. The participants had opportunities to discuss the concepts within small groups and as a whole group. In addition, the participants had opportunities to use and experience different assessments while engaged in a lab activity, a badminton unit. This provided the students with practical application of many of the key concepts.

Data Collection

The researcher trained each participant for 1 hr about how to draw a concept map using a free online software program (i.e., <http://cmap.ihmc.us/>). The training was held in the computer lab so all participants had a chance to work on developing a concept map using this software. The software program helped participants easily draw and modify their concept map as well as export it as a JPEG file (i.e., image file) to send to the researcher via e-mail.

In this training, the researcher provided detailed information about a technical part of the software and shared examples of concept maps on different topics. For example, the researcher showed how to draw circles for concepts, how to make connections among circles using arrows, and how to put linking words on the arrows. The researcher also developed two concept maps using examples (i.e., tree, dogs) with the participants for them to have a sense of what the concept map looks like. The participants shared meaningful concepts about the examples, and the researcher drew the concept maps using the software so all participants could see the concept maps on the screen and be involved in this practice together.

The researcher encouraged the participants to think about concepts by answering focus questions. One of the focus questions was, what are dogs? The researcher had the participants answer this question using the concept map as if they were trying to explain a dog to the person who had never seen one. A different category of examples (i.e., concept links, cross-links, hierarchical links, and examples) was presented by the researcher. The participants had opportunities to ask questions about how to develop concept maps if they still did not understand clearly about what to do.

The researcher provided 30 key concepts and a focus question about assessment in PE before participants drew their own concept map. These 30 key concepts were derived from one of the assessment textbooks, titled as *Assessment-Driven Instruction in Secondary Physical Education: A Standards-Based Approach to Promoting and Documenting Learning* (Lund & Veal, 2013). This textbook was chosen because the authors have more than 32 years of teaching experience in PE including public schools and conducted the research and presented their works about assessment in PE (Lund & Veal, 2013). This textbook has a concept mapping exercise as a pre- and posttest as well. The focus question was, “how is assessment used by physical education teachers?” (Lund & Veal, 2013, p. ix). The lead researcher personally talked to one of the authors of this textbook and found out that they had added, deleted, and modified these key concepts over time and used the focus question and key concepts in developing the textbook.

Based on the given key concepts (i.e., 1–30) and the focus question, participants independently drew their own concept map using the online software. Participants in Group A ($n = 30$) drew one concept map during the first week of the class as a pretest and drew another concept map during the last week (i.e., Week 15) of the class in the same semester as a posttest. Between pre- and posttest, Group A received instructions about assessment in PE for one semester by the researcher. In the middle of the same semester, participants in Group B ($n = 26$) drew their concept map once without any instruction about assessment in PE. An example of a student concept map using all 30 key concepts is illustrated in Figure 1.

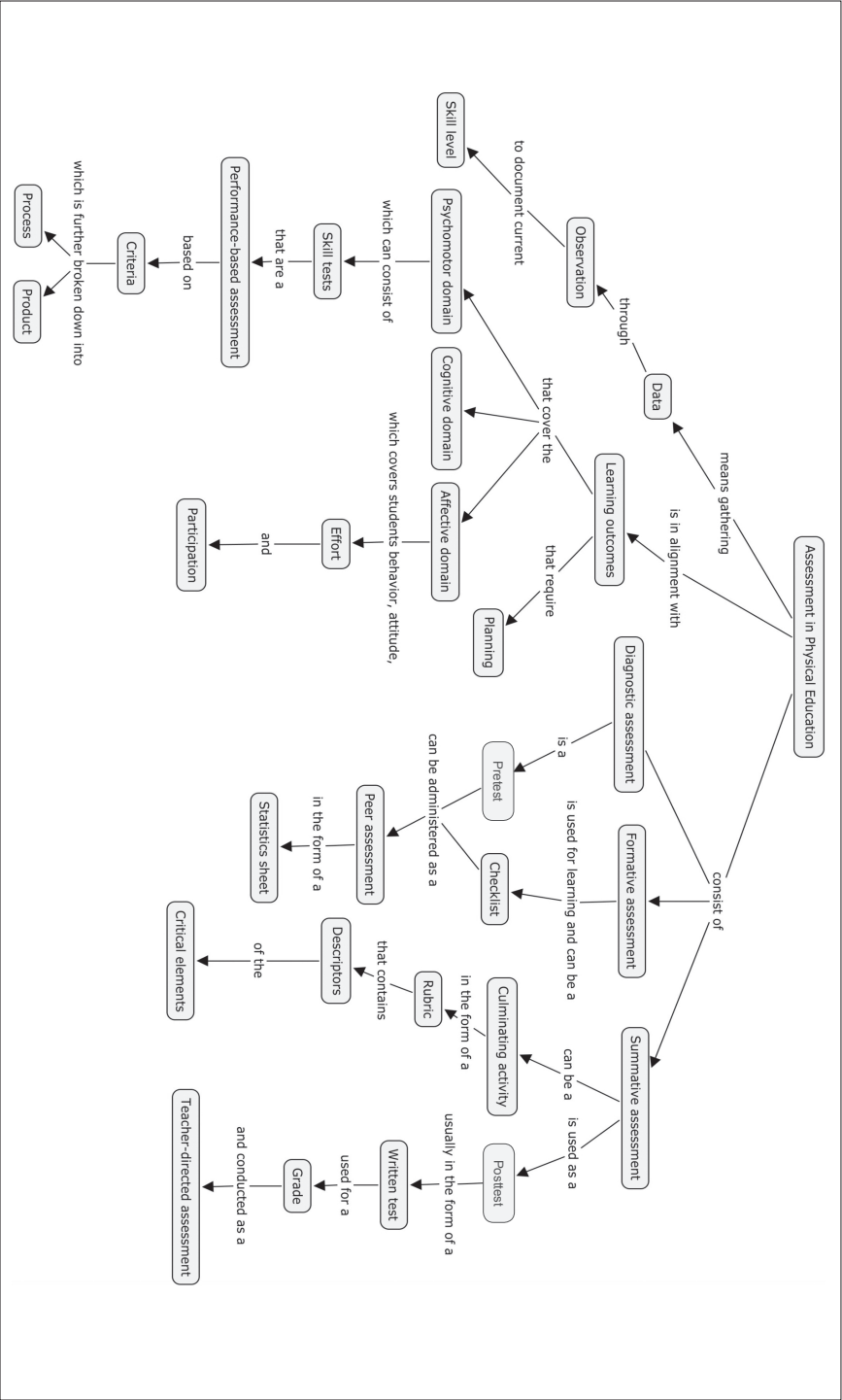


Figure 1. An example of student concept map using all 30 key concepts.

Scoring Methods

Two trained raters scored concept maps using a structural scoring method (Novak & Gowin, 1984) and a relational scoring method (McClure & Bell, 1990; McClure et al., 1999). Both raters are currently working in a PETE program at different universities and are knowledgeable about assessment in PE. As part of their training, they discussed the topic to make sure that they had a consensus in understanding the 30 key concepts. They also practiced together scoring using several examples of concept maps to be familiar with the scoring methods (i.e., structural and relational). They shared possible and valid concept links, cross-links, and hierarchical links. After the training, each rater scored 30% of the data independently using a structural scoring method (Novak & Gowin, 1984) and a relational scoring method (McClure & Bell, 1990; McClure et al., 1999). This 30% of the data was used to analyze interrater reliability for two scoring methods in concept maps.

Structural method. The structural scoring method is widely used in concept map assessment (Novak & Gowin, 1984) and is shown in Figure 2. The structural scoring method is used to score concept maps in four categories: concept links (1 point each), hierarchy (5 points each), cross-links (10 points each), and examples (1 point each). Any invalid links were given 0 points. Concept links indicate that participants link two concepts together using a line with a statement of the relationship. If a concept link was valid, one point was given. Hierarchy indicates that participants arrange one general concept at the top and one specific concept below and make a statement of the relationship. If a hierarchy was valid, it was given 5 points. Cross-links indicate that participants make connections between the concepts from different hierarchies and make a statement of the relationship. One cross-link was given 10 points if it was valid and significant. Examples indicate that participants can provide specific examples about the concepts. Each example was given 1 point if valid. Based on the structural scoring method, a total score and subscores for each category (i.e., concept links, cross-links, hierarchy, and examples) were recorded for each concept map.

Relational method. The relational scoring method was initially introduced by McClure and Bell (1990) and modified by McClure et al. (1999) from science education. According to McClure et al., the relational scoring method is used to score a concept map on a 4-point scale (i.e., 0 to 3 points). If the relationship between concepts was invalid, no point was given. If the relationship between

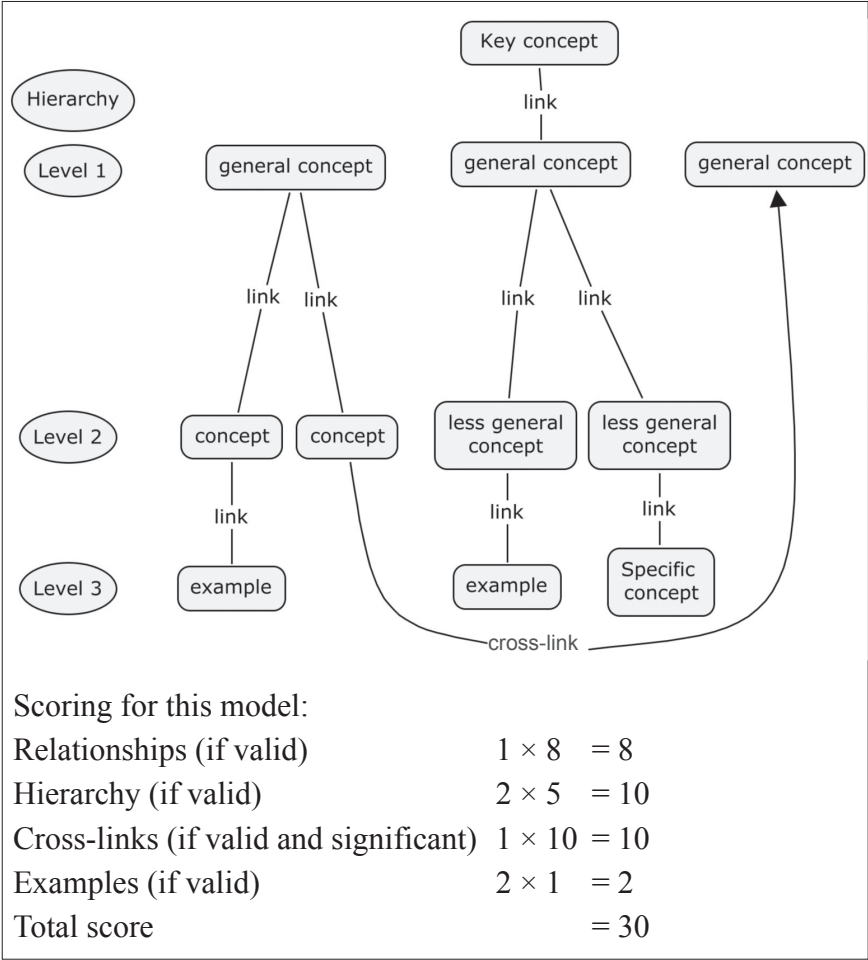


Figure 2. Model of structural scoring method.

concepts was valid but the statement (i.e., linking word or phrase) was incorrect, only 1 point was given. If the relationship between concepts was valid and the statement was correct, 2 points were given. If the relationship between concepts was valid and the direction of the arrow indicated a hierarchical, causal, or sequential relationship with a compatible statement, the highest points (i.e., 3 points) were given. Based on the relational scoring method, a total score and subscores for each point (i.e., 0 to 3 points) were recorded for each concept map.

Data Analysis

Statistical analyses were computed using the SPSS version 19.0 software package (SPSS, Inc., Chicago, IL, USA). To examine interrater reliability, intraclass correlation coefficient (ICC) was calculated using 30% of data. The known-group difference validity evidence of the concept map assessment was evaluated by comparing the total scores and subscores of the concept maps between two groups (i.e., Group A vs. Group B) using independent *t* tests. The responsiveness of the concept map assessment was computed by comparing the total scores and subscores of pre- and posttests from Group A using paired *t* tests. Cohen’s *d* was calculated to determine the effect size. The diagram of the data analysis is shown in Figure 3.

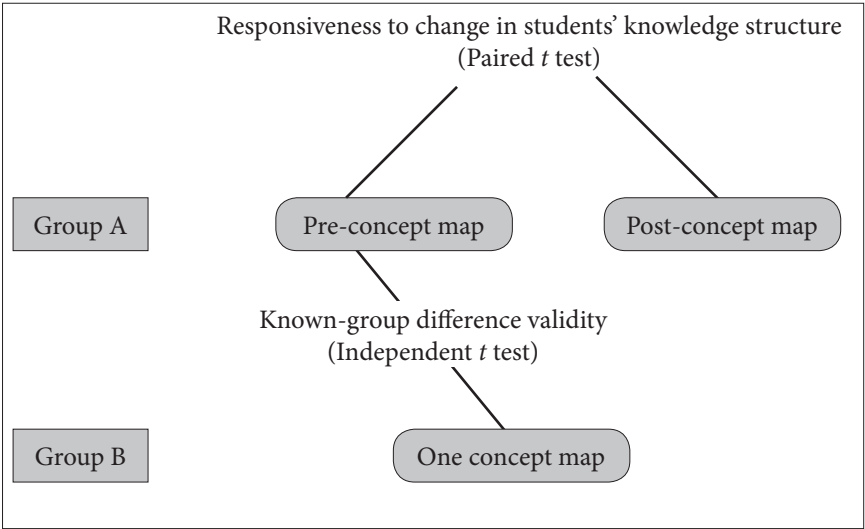


Figure 3. Diagram of data analysis.

Results

The validity and responsiveness of concept map assessment for both scoring methods were supported by the evidence of differences between Group A and Group B and between pre- and posttest for Group A in this study. Mean comparison of total scores and subscores between Group A and Group B and before and after instruction of Group A for structural scoring method is shown in Tables 1 and 2 and mean comparison for relational scoring method is shown in Tables 3 and 4.

Table 1

Mean Comparison of Total Scores and Subscores Between Group A and Group B for Structural Scoring Method

Component	Group A M(SD)	Group B M(SD)	<i>p</i>	Effect size (Cohen's <i>d</i>)
Concept Links	5.87 (4.15)	3.23 (2.86)	.009	0.74
Cross-Links	0 (0)	0 (0)	-	-
Hierarchy	0.17 (0.91)	0 (0)	.357	0.26
Examples	0 (0)	0 (0)	-	-
Total	6.03 (4.30)	3.23 (2.86)	.007	0.77

Table 2

Mean Comparison of Total Scores and Subscores Before and After Instruction of Group A for Structural Scoring Method

Component	Pretest M(SD)	Posttest M(SD)	<i>p</i>	Effect size (Cohen's <i>d</i>)
Concept Links	5.87 (4.15)	14.87 (5.49)	.001	1.85
Cross-Links	0 (0)	0.6 (2.30)	.163	0.37
Hierarchy	0.17 (0.91)	2.83 (3.87)	.001	0.95
Examples	0 (0)	0 (0)	-	-
Total	6.03 (4.30)	18.30 (8.01)	.001	1.91

Table 3

Mean Comparison of Total Scores and Subscores Between Group A and Group B for Relational Scoring Method

Scores	Group A M(SD)	Group B M(SD)	<i>p</i>	Effect size (Cohen's <i>d</i>)
1 Point	7.1 (5.09)	4.77 (2.72)	.035	0.57
2 Points	12.7 (9.3)	5.31 (4.96)	.001	0.99
3 Points	0.90 (2.25)	0.92 (2.21)	.969	0.00
Total	20.77 (8.53)	11 (6.78)	.001	1.27

Table 4

Mean Comparison of Total Scores and Subscores Before and After Instruction of Group A for Relational Scoring Method

Scores	Pretest <i>M</i> (<i>SD</i>)	Posttest <i>M</i> (<i>SD</i>)	<i>p</i>	Effect size (Cohen's <i>d</i>)
1 Point	7.1 (5.09)	7.17 (5.34)	.959	0.01
2 Points	12.7 (9.3)	27.97 (14.04)	.001	1.28
3 Points	0.90 (2.25)	3 (5.17)	.034	0.53
Total	20.77 (8.53)	38.13 (12.62)	.001	1.61

Structural Method

Interrater reliability for scoring the concept maps between two raters using structural method was very high ($ICC = .985$). Total scores for students in Group A ($M = 6.03$, $SD = 4.30$) were significantly higher than scores for students in Group B ($M = 3.23$, $SD = 2.86$), $t(54) = -2.83$, $p = .007$, which supports the known-group difference validity evidence. Cohen's d was .77, which indicates a medium to large effect size. For subscores for each category, concept links ($p = .009$) scores of Group A (i.e., senior group) were significantly different from scores for Group B (i.e., sophomore group).

Total scores of concept map assessment in Group A significantly increased after instruction from the mean of 6.03 ($SD = 4.30$) to the mean of 18.30 ($SD = 8.01$), $t(29) = -8.05$, $p < .001$, which supports the responsiveness of concept map assessment scores. Cohen's d was 1.91, which indicates a large effect size. The concept links ($p = .001$) and hierarchy ($p = .001$) subscores of concept maps increased significantly after instruction.

Relational Method

Interrater reliability for scoring the concept maps between two raters using relational method was very high ($ICC = .946$). Total scores for students in Group A ($M = 20.77$, $SD = 8.53$) were significantly higher than for students in Group B ($M = 11.00$, $SD = 6.78$), $t(54) = -4.69$, $p < .001$, which supports the known-group difference validity evidence. Cohen's d was 1.27, which indicates a large effect size. For subscores for each point, 1 point ($p = .035$) and 2 points ($p = .001$) subscores of Group A were significantly different from subscores of Group B.

Total scores of concept map assessment in Group A significantly increased after instructions from the mean of 20.77 ($SD = 8.53$) to the mean of 38.13 ($SD = 12.62$), $t(29) = -8.55$, $p < .001$, which supports the responsiveness of concept map assessment scores. Cohen's d was 1.61, which indicates a large effect size. Two points ($p = .001$) and 3 points ($p = .034$) subscores of concept map assessment significantly increased after instruction.

Discussion

The results of this study provide evidence of validity and responsiveness of concept map assessment. It reflects predictable difference between senior students and sophomore students and the change in the students' knowledge structure before and after instruction in the PETE program. Because senior students took more major courses in the PETE program than sophomore students did, it was assumed that senior students had more knowledge about PE than sophomore students did. It is possible that senior students have more knowledge about assessment in PE than sophomore students do. It was also assumed that students' understanding or knowledge structure would change after instruction and thus higher concept map scores were expected after instruction than before instruction.

In this study, two scoring methods were used and both scoring methods supported the validity evidence for concept map assessment. These findings are different from West et al.'s (2002) findings, who reported that the relational scoring method did not show the resident doctors' knowledge changes before and after instructions and the knowledge differences based on their level of training. However, they demonstrated that the structural scoring method was a valid measure for concept map assessment. One possible explanation is that validity is context specific. Different educational settings may affect this difference (i.e., college students in PETE versus pediatric resident doctors in medical school). It is also possible that one scoring method may not be appropriate for a particular context. The small sample size ($n = 21$) of West et al.'s (2002) study could be another factor that influenced the results of their study. Therefore, the accumulation of validity evidence for concept map assessment is needed to further support the use of concept map assessment in PETE.

Based on the findings about the subscores of each category in structural method, there were no significant differences between Group A (i.e., senior student group) and Group B (i.e., sophomore

student group) in the category of cross-links and hierarchy. One possible reason is because a limited number of key concepts ($n = 30$) were provided when the students developed their concept maps. With a limited number of key concepts, it may not be possible to make many cases for cross-links or hierarchy relationships. This result is the same as the findings of the relational scoring method in which no significant differences were observed in the scoring category of 3-point relationship between Group A and Group B.

Concept map assessment can be administered with or without a list of key concepts. Thirty key concepts about assessment in PE were provided in this study before the teacher candidates drew their concept maps. McClure et al. (1999) provided a list of key concepts from an educational psychology program when they asked students to produce a concept map. The selected key concepts, however, may influence their knowledge structure either positively or negatively depending on their level of knowledge about a particular topic. In some studies, in different subject matters, concepts were not provided to students (West et al., 2002; West et al., 2000). In this case, students needed to recall all important concepts about a given topic and to integrate their knowledge using the concepts about which they already knew when they drew their concept maps.

Limitations

The current study is not without limitations. Even though we provided a list of 30 key concepts selected by the experts, there may not have been enough key concepts about examples (i.e., one of scoring categories for structural scoring method), which limited the participants from making a case in their concept maps. We rarely found the category of examples and hierarchies from the concept maps in this study, which implies that the structural scoring method may not be appropriate if the list of key concepts were given. This could be the same for the relational scoring method. Due to a limited number of key concepts, not enough hierarchical, causal, or sequential relationships (i.e., 3-point relationships) were found in the relational scoring method. Because the scoring of the concept maps is intuitive, a high ICC was expected in both scoring methods (i.e., structural scoring method, $ICC = .985$; relational scoring method, $ICC = .946$). It may be better to use the total scores when the list of key concepts is provided. When the teacher wants to look at sub-scores of each category or each point, it may be better not to provide key concepts or to provide many key concepts.

Another limitation of this study is that we only established the known-group difference validity evidence and the responsiveness of the concept map assessment scores in PETE programs. The time and effort that teacher candidates spent to develop concept maps may have been an issue. Because concept mapping activities were conducted by students themselves in different conditions, some of them may not have done their best to develop their concept maps. Students also may have developed their post-concept map while looking at their pre-concept map. In this case, students' conceptual understanding could be compounded, even though the results of this study showed the changes of their knowledge structure.

Implications and Future Directions

Concept map assessment can be used to provide information about what and how to improve the contents of current courses within PETE programs. In the current study, there is evidence of validity and responsiveness of the concept map assessment scores in PETE programs. Concept map assessment can be an effective tool to evaluate PETE programs, as it may be used to measure teacher candidates' knowledge structure. It may be used as an ongoing self-assessment tool to measure what teacher candidates know and can do. It also allows teacher educators to identify teacher candidates' understandings and misunderstandings about a particular topic so they can modify or change their instruction. Furthermore, it helps teacher candidates become well-equipped and effective PE teachers.

PCK can be assessed using concept map assessment. Ayvazo and Ward (2011) demonstrated that PCK can be observed and measured using observation of student–teacher interactions and their appropriateness, which they called functional analysis. Even though direct observation using functional analysis of instructional adaptations may be used to measure teachers' PCK accurately, it does take much time to assess and analyze teachers' PCK, and it may not be an efficient way to measure their PCK. If more validation studies about concept map assessment are conducted in different contexts with different content, concept map assessment may be used as an alternative assessment tool to measure teacher candidates' PCK using an operational definition of PCK in PETE programs. In addition, it will help teacher candidates learn more PCK in their PETE programs.

Through concept map assessment, teacher candidates will obtain in-depth knowledge in PETE programs. Different objective tests are used in PETE programs including multiple-choice questions, true

and false questions, short essay questions, journals, projects, and portfolios (Lund & Kirk, 2002). If alternative assessments including concept map assessment are used with these traditional tests, it would be better for teacher educators to help teacher candidates' learning. It is critical that different assessments be used for teacher candidates' learning, as well as their grade, in PETE programs.

Based on the findings and limitations of the current study, the following future directions for research are offered. First, future research is needed to compare conditions based on the amount of key concepts given (e.g., 30, 50, 80). The scores in subcategories of scoring methods need to be compared under conditions with different amounts of key concepts. In addition, future research would be to compare two conditions (i.e., providing key concepts versus not providing key concepts) and to examine how these conditions influence the effectiveness of concept map assessment in a particular content.

Second, future research is needed to establish different validity evidence for concept map assessment. For example, it may be possible to establish convergent validity in concept map assessment by comparing concept map assessment scores with standardized test scores in a particular content. Additional directions of future studies would be replication studies using different content, context, conditions, and participants. For example, concept map assessment could be used in other major courses in a PETE program such as motor behavior, curriculum, and adapted PE courses. It could also be used in the same content with different contexts (e.g., lecture-based course vs. lecture and field experience course).

Finally, future research could be conducted in a more controlled context to remove compounding factors. How much time participants spend and how much effort they put into developing concept maps may threaten the validity of concept map assessment scores. To remove these compounding factors, teacher educators could ask teacher candidates to develop their concept maps in a computer lab for a certain time so they spend the same amount of time developing their concept maps. This way, all teacher candidates experience the same environmental testing conditions.

References

- Austin, L. B., & Shore, B. M. (1995). Using concept mapping for assessment in physics. *Physics Education*, 30, 41–45.

- Ayvazo, S., & Ward, P. (2011). Pedagogical content knowledge of experienced teachers in physical education: Functional analysis of adaptations. *Research Quarterly for Exercise and Sport*, 82, 675–684.
- Besterfield-Sacre, M., Gerchak, J., Lyons, M., Shuman, L., & Wolfe, H. (2004). Scoring concept maps: An integrated rubric for assessing engineering education. *Journal of Engineering Education*, 93, 105–115.
- Ennis, C. D., Mueller, L. K., & Zhu, W. (1991). Description of knowledge structures within a concept-based curriculum framework. *Research Quarterly for Exercise and Sport*, 62, 309–318.
- Kassab, S. E., & Hussain, S. (2010). Concept mapping assessment in a problem-based medical curriculum. *Medical Teacher*, 32, 926–931.
- Lund, J. L., & Kirk, M. F. (2002). *Performance-based assessment for middle and high school physical education*. Champaign, IL: Human Kinetics.
- Lund, J. L., & Veal, M. L. (2013). *Assessment-driven instruction in secondary physical education: A standards-based approach to promoting and documenting learning*. Champaign, IL: Human Kinetics.
- McClure, J. R., & Bell, P. E. (1990). *Effects of an environmental education related STS approach instruction on cognitive structures of preservice science teachers*. Retrieved from ERIC. (ED341582)
- McClure, J. R., Sonak, B., & Suen, H. K. (1999). Concept map assessment of classroom learning: Reliability, validity, and logistical practicality. *Journal of Research in Science Teaching*, 36, 475–492.
- Mohammed, A. M. S. E. (2010). The effect of using concept maps strategy on the maintenance level in kinetic education for grade one female students in faculty of physical education for girls in Elgezira. *World Journal of Sport Sciences*, 3, 119–124.
- National Association for Sport and Physical Education. (2008). *National initial physical education teacher education standards*. Retrieved from <http://www.aahperd.org/naspe/grants/accreditation/upload/2008-National-Initial-PETE-Standards.pdf>

- National Council for Accreditation of Teacher Education. (2008). Professional standards for the accreditation of schools, colleges, and departments of education. Retrieved from <http://www.ncate.org/Standards/NCATEUnitStandards/UnitStandardsinEffect2008/tabid/476/Default.aspx>
- Novak, J. D., & Cañas, A. J. (2008). *The theory underlying concept maps and how to construct and use them* (Technical Report IHMC Cmaps Tools 2008-1). Pensacola, FL: Florida Institute for Human and Machine Cognition.
- Novak, J. D., & Gowin, D. B. (1984). *Learning how to learn*. New York, NY: Cambridge University Press.
- Pearsall, N. R., Skipper, E. J., & Mintzes, J. J. (1997). Knowledge restructuring in the life sciences: A longitudinal study of conceptual change in biology. *Science Education*, 81, 193–215.
- Rice, D. C., Ryan, J. M., & Samson, S. M. (1998). Using concept maps to assess student learning in the science classroom: Must different methods compete? *Journal of Research in Science Teaching*, 35, 1103–1127.
- Rink, J. E., French, K., Lee, A. M., Solomon, M. A., & Lynn, S. K. (1994). A comparison of pedagogical knowledge structures of preservice students and teacher educators in two institutions. *Journal of Teaching in Physical Education*, 13, 140–162.
- Ruiz-Primo, M. A., & Shavelson, R. J. (1996). Problems and issues in the use of concept maps in science assessment. *Journal of Research in Science Teaching*, 33, 569–600.
- Rye, J. A., & Rubba, P. A. (2002). Scoring concept maps: An expert map-based scheme weighted for relationships. *School Science and Mathematics*, 102, 33–44.
- West, D. C., Park, J. K., Pomeroy, J. R., & Sandoval, J. H. (2002). Concept mapping assessment in medical education: A comparison of two scoring systems. *Medical Education*, 36, 820–826.
- West, D. C., Pomeroy, J. R., Park, J. K., Gerstenberger, E. A., & Sandoval, J. H. (2000). Critical thinking in graduate medical education: A role for concept mapping assessment? *Journal of the American Medical Association*, 284, 1105–1110.

PEDAGOGY

Active and Healthy Schools

Stephen Ball, Jessica Kovarik, Heather Leidy

Abstract

The Active and Healthy School Program (AHS) can be used to alter the culture and environment of a school to help children make healthier choices. The purpose of this study was to determine the effectiveness of AHS to increase physical activity while decreasing total screen time, increase healthy food choices, and improve knowledge about physical activity and nutrition among students. Pedometry quantified physical activity time and steps in 150 children (fifth to eighth grades). Children's Attraction to Physical Activity (CAPA) and Youth Risk Behavior Surveillance Survey (YRBSS) dietary behavior questions were also administered. Students participated in 80 ± 10 min of television viewing and/or computer and video game usage per day with no change in behavior observed following the intervention. No differences in step counts at home (prestudy: $5,728 \pm 343$ steps/day vs. poststudy: $6,583 \pm 634$ steps/day; $p = 0.17$) or school (prestudy: $5,405 \pm 184$ steps/day vs. poststudy: $5,613 \pm 533$ steps/day; $p = 0.17$) were observed following the intervention. However, physical activity time during school increased by 10 ± 1 min ($p < 0.001$) following the intervention. The CAPA score decreased slightly (prestudy: 35.4 ± 1.2 au; poststudy: 33.4 ± 1.4 au, $p < 0.01$). The frequency of consuming fruit ($p < 0.03$) and vegetables other than salad ($p < 0.03$) increased by $31\% \pm 8\%$ and $43\% \pm 10\%$, respectively. AHS is an effective school-based intervention that positively impacts contributing factors of obesity. School administrators should consider implementing many of the AHS components to improve the health of their students.

Stephen Ball is an associate professor in the Department of Nutrition and Exercise Physiology, University of Missouri. Jessica Kovarik an extension associate in the Department of Nutrition and Exercise Physiology, University of Missouri. Heather Leidy is an assistant professor in the Department of Nutrition and Exercise Physiology, University of Missouri. Please send author correspondence to Stephen Ball, University of Missouri, 113 McKee, Columbia, MO 65211. E-mail: ballsd@missouri.edu

According to the most recent National Health and Nutrition Examination Survey data, almost one third of American young people are overweight or obese (Ogden, Carroll, Kit, & Flegal, 2012). Children who are overweight and obese have increased cardiovascular disease risk factors, such as elevated lipid concentrations, high cholesterol, and high blood pressure (Freedman, Mei, Srinivasan, Berenson, & Dietz, 2007); they also are at a greater risk of developing type 2 diabetes (Li, Ford, Zhao, & Mokdad, 2009). Approximately 80% of youth who are obese will become overweight and obese adults if left to their own accord (Guo, Roche, Chumlea, Gardner, & Siervogel, 1994; Serdula et al., 1993). It is critical to identify novel strategies to treat this disease.

School-Based Interventions

Because children are at school for almost half of their waking hours and also eat there, it is a valuable place to initiate physical activity (PA) and nutrition behavior change that may impact childhood obesity. Typically, school officials have relied on physical education (PE) to get kids moving and keep them lean and fit (Lee, Burgeson, Fulton, & Spain, 2007). Unfortunately, this model has mostly failed, as more kids are overweight than ever before (Ogden et al., 2012). Recently, several multifaceted school-based PA and nutrition programs have been implemented that help change the culture of a school to encourage healthy behaviors (Kelly & Melnyk, 2008).

Kelly and Melnyk (2008), in a systematic review of 17 multicomponent interventions with overweight middle school adolescents, concluded that a structured program targeting physical education, nutrition, and behavioral skills is the most effective type of program for reducing risk factors of overweight and obesity. Other researchers have found an effective school-based intervention includes PA, dietary, healthy lifestyle education, and parental involvement and should be implemented at the earliest grade level possible (Zenzen & Kridli, 2009). Of the 16 studies reviewed by Zenzen and Kridli (2009), only nine programs had all four components (PA, dietary, healthy lifestyle education, and parental involvement).

One school-based program that has all four major components of an effective program and shows promise as a sustainable intervention is the Active and Healthy School Program (AHS) developed by Dr. Bob Pangrazi at Arizona State University. The program is based on the premise that meaningful change will come from providing children accurate information with which to make healthy choices

and changing their surrounding environment to support healthier choices. Children are educated on what healthy choices are, and the altered environment makes those choices easier.

Through our unpublished pilot data (Ball & Kovarik, 2012) of an investigation of AHS in a single school ($n = 28$) pre- and postprogram, we found increased PA via pedometry, improved knowledge about PA (Children's Attraction to Physical Activity Survey), and improved nutritional habits and knowledge (Youth Risk Behavior Surveillance Survey). Although the results of the pilot data are positive, additional research is needed. To our knowledge, the efficacy of this program has not been systematically investigated. Therefore, the purpose of this study was to determine the efficacy of the AHS program. Specifically, we examined the effectiveness of AHS to increase PA time and steps (via pedometry) while decreasing total screen time, increase healthy food choices, and improve knowledge about PA and nutrition among students.

Methods

Subjects

One hundred fifty students in fifth to eighth grades from two schools participated in the project. Schools were selected that were similar in size, demographics, and location. University of Missouri Institutional Review Board reviewed this research and granted a waiver of consent. Students were thus not required to sign an informed consent or obtain parental permission to participate. Parental notes were sent home allowing parents to refuse student participation. All students in the two schools in fifth to eighth grades participated in the project. Data were collected in the fall (preprogram) and in the spring (postprogram) of the same school year during the school day.

Experimental Design/AHS Program

This is a study of school-aged children to assess the changes in select PA and nutrition parameters at baseline and following 20 weeks of the AHS program. Prior to the fall semester, a 1-day training occurred for school faculty and staff. Specifically, teachers learned their role, how to implement classroom activity breaks, and how to use pedometers. Teachers were trained by our research staff on how to encourage discussion about PA and nutrition among students. Ideas for incorporating activity and nutrition into their curriculum

were shared. The PE teacher was identified as the “Program Leader” and was additionally trained on data collection methods, how to zone playgrounds, and how to display AHS signage. Last, all faculty and staff learned how they could become more physically active and improve their own nutrition choices. At this time, school faculty received AHS materials, which included AHS manual, activity cards, pedometers, signs, newsletters, balls, cones, volleyball nets, bean bags, among other items. After the initial data collection period, changes to the school environment were implemented. To increase PA, the playground was “zoned” for more structure and supervision. Examples of zones included sports, new game, new skill, low intensity, parachute games, long jump rope, scoops and balls, and a walking trail. The playground was renamed to “Activity Zone” and recess was renamed “Activity Time” to remind students to be active during recess. Point of Decision Prompts, part of the AHS materials, were placed throughout the school to remind students about PA choices. Classroom teachers integrated 3- to 5-min PA breaks using the AHS activity cards. Activity cards are laminated lesson plans that teachers can use to implement movement in the classroom with little or no equipment. Students tracked PA using pedometers and attempted to reach individual step count goals.

Letters were sent home to parents explaining healthier celebratory food options and nonfood options. Healthier dietary selections were available in the school cafeteria, and to encourage better nutrition choices, students were rewarded for healthy choices with fruit and vegetable stickers. Educational materials were sent home to encourage healthy brown bag lunches, and nutrition messages were shared over the intercom or by classroom teachers.

Physical Activity

Pedometers (Walk4Life™ model Duo BB02) were used to measure students’ PA change. After initial training (1 week) by the PE teacher, students recorded activity time and steps, at school and at home, for 5 consecutive school days and recorded total activity time and steps per day for one weekend (Saturday and Sunday) following the consecutive schools days. The protocol is similar and consistent with previous research (Rowe, Mahar, Raedeke, & Lore, 2004). During the same time, students recorded screen time (including television, computer, and video game use) in minutes.

The Children’s Attraction to Physical Activity (CAPA) inventory (survey) was used to measure children’s attraction to PA. The

CAPA is a validated measure of children's attraction to PA (Rose, Larkin, Hands, Howard, & Parker, 2009) and was administered by AHS Program Leaders (on-site manager) during physical education class. University of Missouri researchers were present for the completion of the CAPA for pre- and postprogram data collection.

Nutrition Behavior

Youth Risk Behavior Surveillance Survey (YRBSS) dietary behavior questions were used to assess dietary behaviors such as fruit, vegetable, soda pop, and milk consumption. The YRBSS survey was given during physical education class by the AHS Program Leaders on the same day as the CAPA. University of Missouri researchers were present for the completion of YBRSS nutrition questions for pre- and postprogram data collection.

Data Analysis

A repeated measures ANOVA was applied to identify main effects of time (pre- vs. poststudy changes) for screen time, PA steps, PA time, CAPA scores, and nutrition data (100% fruit juice, fruit, green salad, potatoes, carrots, non-salad vegetables, glasses of milk, and soda pop consumption) for both schools. Analyses were conducted using the Statistical Package for the Social Sciences (SPSS, version 21.0, Chicago, IL, USA). Statistical significance was $p < 0.05$. Data are reported at $M \pm SEM$.

Results

The students participated in approximately 80 ± 10 min of television viewing and/or computer and video game usage per day with no change in behavior observed following the intervention (Figure 1). Change in PA was assessed through measures of step count and time in PA. No differences in step counts at home (prestudy: $5,728 \pm 343$ steps/day vs. poststudy: $6,583 \pm 634$ steps/day, $p = 0.17$) or school (prestudy: $5,405 \pm 184$ steps/day vs. poststudy: $5,613 \pm 533$ steps/day, $p = 0.17$) were observed following the intervention. However, as shown in Figure 2, PA time during school increased by 10 ± 1 min ($p < 0.001$) following the intervention. No pre- to poststudy change in PA time at home was observed. Although a slight decrease in the CAPA score was observed following the intervention (prestudy: 35.4 ± 1.2 au; poststudy: 33.4 ± 1.4 au, $p < 0.01$), the ratings were still well within the positive range for this test outcome. Also of interest is the finding that this slight reduction was driven

by gender such that girls displayed a significant reduction in CAPA ($p < 0.01$), whereas the boys did not. Last, the change in dietary habits was also assessed throughout the intervention (Table 1). The frequency of consuming fruit ($p < 0.03$) and vegetables other than salad ($p < 0.03$) was found to increase by $31\% \pm 8\%$ and $43\% \pm 10\%$, respectively, following the intervention. However, soda consumption also increased by $37\% \pm 8\%$ ($p < 0.05$).

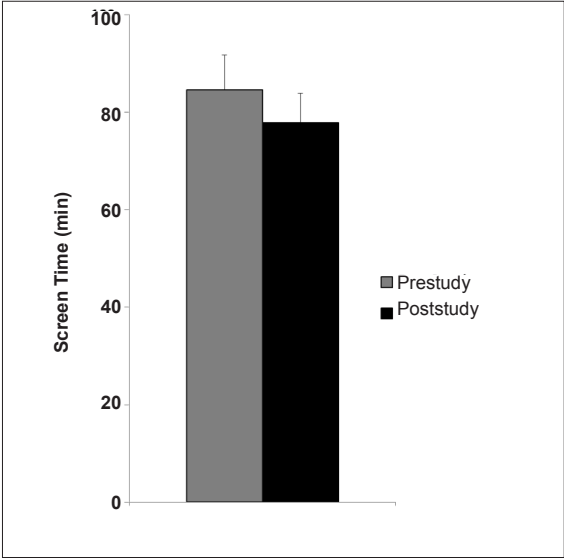


Figure 1. Change in screen time ($n = 114$ students).

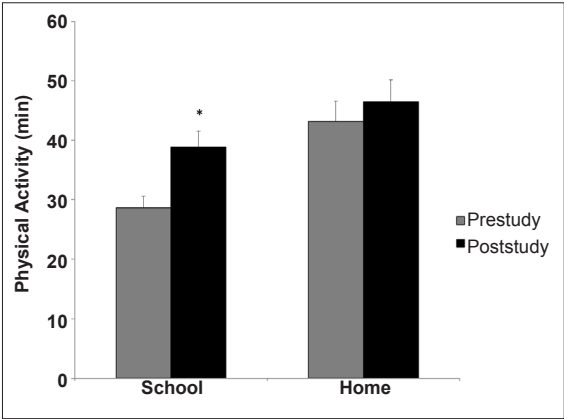


Figure 2. Change in physical activity time during school and at home ($n = 150$ students).

Table 1
Change in Dietary Habits (n = 136 students)

Dietary component	Frequency of consumption		
	Prestudy (au)	Poststudy (au)	Percent change (%)
100% fruit juice	2.42 ± 0.13	2.65 ± 0.13	+40 ± 10
Fruit	3.46 ± 0.12	3.80 ± 0.13	+31 ± 8*
Green salad	2.06 ± 0.11	2.01 ± 0.10	+24 ± 8
Potato	2.04 ± 0.10	2.29 ± 0.12	+42 ± 10
Carrot	2.03 ± 0.12	2.14 ± 0.12	+38 ± 10
Other vegetables	3.02 ± 0.12	3.42 ± 0.13	+43 ± 10*
Milk	4.01 ± 0.15	4.04 ± 0.14	+24 ± 9
Soda pop beverages	2.45 ± 0.12	2.77 ± 0.15	+37 ± 8

*Repeated measures ANOVA; pre vs. post; *p* < 0.05.

Discussion

The AHS school environment and culture changes appear to have positively impacted the PA of students during the school day. The significant increase in activity time is partly attributed to increased activity time during recess. The reorganization or zoning of the playground allowed students to find equipment quickly and to select activities. Zoning encourages all students to be active, not just the athletic or the lean, and has been shown to increase PA during recess (Beighle, Morgan, Le Masurier, & Pangrazi, 2006; Ridgers, Stratton, Fairclough, & Twisk, 2007). On a typical playground, the strong dominate the weak and monopolize the best areas and equipment (Stanley, Boshoff, & Dollman, 2012). During a typical recess on an unzoned playground only about 20% to 45% of students are actively engaged in activity (Mota et al., 2005; Ridgers, Stratton, & Fairclough, 2005). In a separate unpublished study (Gillespie & Ball, 2012) of second and fifth graders (*n* = 260), we found that before zoning, only 17% of students were active; however, after zoning, 58% of students were active according the SO-PLAY observation tool.

Classroom activity breaks also may have led to the observed activity time. When used throughout the day, these short bursts of activity can contribute to increasing students’ overall activity time (Donnelly et al., 2009; Edwards, Mauch, & Winkelman, 2011; Pan-

grazi, Beighle, Vehige, & Vack, 2003). Unfortunately, no data were collected on the frequency and duration of activity breaks during this study. We recognize this as a limitation. Another limiting factor of the current research is our data include recess, physical education class, activity breaks, and all other PA; future studies should separate PA time to determine where increases in PA time occurred. A better understanding of where PA is increased, and not increased, may improve AHS.

No statistical difference in steps was observed after implementing AHS for boys, girls, or the combination. The lack of significance with steps compared with activity time is likely due to the large variation in stride lengths among children. Other researchers have used PA time over steps counts as the objective measure of PA change (Wickel et al., 2007). Another alternative would be the use of accelerometers to measure PA time, speed, and intensity.

Children's attitudes, beliefs, and knowledge about PA determine how motivated they will be to engage in PA (Brustad, 1993). The CAPA likert scale is a validated tool used to determine children's interest and attitudes toward PA (Rose et al., 2009), with a higher score indicating a higher attraction to PA and likelihood to engage in PA. Previous literature has shown CAPA scores can vary greatly between schools. For example, Barry, Moore, Webb, Hill, and Kohl (2002), using another school-based intervention program called TAKE 10!, reported CAPA scores ranging from 15 to 60 among students Grades 3 to 5. Our data did not demonstrate an increase in attraction to PA postintervention despite being administered in the classroom setting by the same trained researcher. One possible explanation is many students scored high initially on the test. With a larger sample size, it may be possible to look at only students that scored low initially on the CAPA.

In addition to PA, a secondary component of AHS is to influence eating behavior. Nutrition information from the University of Missouri Extension was provided to classroom teachers, online resources were made available to teachers, staff learned ways to promote healthy foods at school events, and newsletters were sent to parents describing healthy brown bag lunches and celebratory foods. The YRBSS nutrition questions were used to assess consumption of fruit, fruit juice, vegetables, dairy, and soda pop. Monitoring intake of these foods can indicate if changes in nutrients such as calories, fiber, sugar, and calcium were influenced. Following programming, students significantly increased fruit consumption ($p = 0.026$) and

non-salad vegetable consumption ($p < 0.03$). Based on current evidence, children are still not meeting the World Health Organization goal of 400 g of fruit and vegetables per day (Krolner et al., 2011). Specifically, most children are consuming only half as many servings of fruits and half as many servings of vegetables than recommended (Guenther, Dodd, Reedy, & Krebs-Smith, 2006). Thus, based on our findings, we suggest that implementing nutrition-related school programs may increase the frequency of fruit and vegetable consumption. Other than soda pop consumption increasing, the other nutrition variables remained unchanged after AHS. One possible explanation for the increase in soda is the high number of end-of-the year celebrations typical of a normal school year. In the future, researchers may investigate this phenomenon and control for it.

Conclusion

Because children spend a significant amount of time at school, it is a logical place to influence behavior. Typically, School administrators have relied on PE to get kids moving and help keep youth fit and lean. Unfortunately, this model has failed miserably as more youth are overweight and unfit than ever before. New multifaceted approaches, such as AHS, that include PA, nutrition education, healthy lifestyle education, and parental involvement may prove to be more effective than traditional methods. Previously, the AHS program had not been systematically investigated. Our findings support AHS as an effective school-based intervention that positively impacts behaviors contributing to obesity. School-wide environmental and cultural changes provided through AHS help youth meet PA recommendations and improve eating behaviors. School administrators should consider implementing many of the AHS components to improve the health of their students.

References

- Ball, S., & Kovarik, J. (2012). [Investigation of Active and Healthy Schools program in a single school pre- and postprogram]. Unpublished pilot data.
- Barry, M., Moore, B., Webb, T., Hill, J., & Kohl, H. (2002). Elementary school children's attraction to physical activity in a classroom-based program: Take 10! *Medicine & Science in Sports & Exercise*, 34(5), s3000.

- Beighle, A., Morgan, C. F., Le Masurier, G., & Pangrazi, R. P. (2006). Children's physical activity during recess and outside of school. *Journal of School Health, 76*(10), 516–520. doi:10.1111/j.1746-1561.2006.00151.x
- Brustad, R. J. (1993). Who will go out to play? Parental and psychological influences on children's attraction to physical activity. *Pediatric Exercise Science, 5*, 210–223.
- Donnelly, J. E., Greene, J. L., Gibson, C. A., Smith, B. K., Washburn, R. A., Sullivan, D. K., . . . Williams, S. L. (2009). Physical activity across the curriculum (PAAC): A randomized controlled trial to promote physical activity and diminish overweight and obesity in elementary school children. *Preventive Medicine, 49*(4), 336–341. doi:10.1016/j.ypmed.2009.07.022
- Edwards, J. U., Mauch, L., & Winkelman, M. R. (2011). Relationship of nutrition and physical activity behaviors and fitness measures to academic performance for sixth graders in a Midwest city school district. *Journal of School Health, 81*(2), 65–73. doi:10.1111/j.1746-1561.2010.00562.x
- Freedman, D. S., Mei, Z., Srinivasan, S. R., Berenson, G. S., & Dietz, W. H. (2007). Cardiovascular risk factors and excess adiposity among overweight children and adolescents: The Bogalusa Heart Study. *The Journal of Pediatrics, 150*(1), 12–17. e2. doi:10.1016/j.jpeds.2006.08.042
- Gillespie, T., & Ball, S. (2012). [Investigation of Active and Healthy Schools program on second and fifth graders]. Unpublished study data.
- Guenther, P. M., Dodd, K. W., Reedy, J., & Krebs-Smith, S. M. (2006). Most Americans eat much less than recommended amounts of fruits and vegetables. *Journal of the Academy of Nutrition and Dietetics, 106*(9), 1371–1379. doi:10.1016/j.jada.2006.06.002
- Guo, S. S., Roche, A. F., Chumlea, W. C., Gardner, J. D., & Siervogel, R. M. (1994). The predictive value of childhood body mass index values for overweight at age 35 y. *The American Journal of Clinical Nutrition, 59*(4), 810–819.
- Kelly, S. A., & Melnyk, B. M. (2008). Systematic review of multicomponent interventions with overweight middle adolescents: Implications for clinical practice and research. *Worldviews on Evidence-Based Nursing, 5*(3), 113–135. doi:10.1111/j.1741-6787.2008.00131.x

- Krolner, R., Rasmussen, M., Brug, J., Klepp, K. I., Wind, M., & Due, P. (2011). Determinants of fruit and vegetable consumption among children and adolescents: A review of the literature. Part II: Qualitative studies. *International Journal of Behavioral Nutrition and Physical Activity*, 8, 112. doi:10.1186/1479-5868-8-112
- Lee, S. M., Burgeson, C. R., Fulton, J. E., & Spain, C. G. (2007). Physical education and physical activity: Results from the School Health Policies and Programs Study 2006. *Journal of School Health*, 77(8), 435–463. doi:10.1111/j.1746-1561.2007.00229.x
- Li, C., Ford, E. S., Zhao, G., & Mokdad, A. H. (2009). Prevalence of pre-diabetes and its association with clustering of cardiometabolic risk factors and hyperinsulinemia among U.S. adolescents: National Health and Nutrition Examination Survey 2005–2006. *Diabetes Care*, 32(2), 342–347. doi:10.2337/dc08-1128
- Mota, J., Silva, P., Santos, M. P., Ribeiro, J. C., Oliveira, J., & Duarte, J. A. (2005). Physical activity and school recess time: Differences between the sexes and the relationship between children's playground physical activity and habitual physical activity. *Journal of Sports Sciences*, 23(3), 269–275. doi:10.1080/02640410410001730124
- Ogden, C. L., Carroll, M. D., Kit, B. K., & Flegal, K. M. (2012). Prevalence of obesity and trends in body mass index among US children and adolescents, 1999–2010. *JAMA*, 307(5), 483–490. doi:10.1001/jama.2012.40
- Pangrazi, R. P., Beighle, A., Vehige, T., & Vack, C. (2003). Impact of promoting lifestyle activity for youth (PLAY) on children's physical activity. *Journal of School Health*, 73(8), 317–321.
- Ridgers, N. D., Stratton, G., & Fairclough, S. J. (2005). Assessing physical activity during recess using accelerometry. *Preventive Medicine*, 41(1), 102–107. doi:10.1016/j.ypmed.2004.10.023
- Ridgers, N. D., Stratton, G., Fairclough, S. J., & Twisk, J. W. (2007). Children's physical activity levels during school recess: A quasi-experimental intervention study. *International Journal of Behavioral Nutrition and Physical Activity*, 4, 19. doi:10.1186/1479-5868-4-19

- Rose, E., Larkin, D., Hands, B., Howard, B., & Parker, H. (2009). Evidence for the validity of the Children's Attraction to Physical Activity questionnaire (CAPA) with young children. *Journal of Science and Medicine in Sport*, 12(5), 573–578. doi:10.1016/j.jsams.2009.05.009
- Rowe, D., Mahar, M., Raedeke, T., & Lore, J. (2004). Measuring physical activity in children with pedometers: Reliability, reactivity, and replacement of missing data. *Pediatric Exercise Science*, 16(4), 343–354.
- Serdula, M. K., Ivery, D., Coates, R. J., Freedman, D. S., Williamson, D. F., & Byers, T. (1993). Do obese children become obese adults? A review of the literature. *Preventive Medicine*, 22(2), 167–177. doi:10.1006/pmed.1993.1014
- Stanley, R. M., Boshoff, K., & Dollman, J. (2012). Voices in the playground: A qualitative exploration of the barriers and facilitators of lunchtime play. *Journal of Science and Medicine in Sport*, 15(1), 44–51. doi:10.1016/j.jsams.2011.08.002
- Wickel, E. E., Eisenmann, J. C., Pangrazi, R. P., Graser, S. V., Raustorp, A., Tomson, L. M., & Cuddihy, T. F. (2007). Do children take the same number of steps every day? *American Journal of Human Biology*, 19(4), 537–543. doi:10.1002/ajhb.20613
- Zenzen, W., & Kridli, S. (2009). Integrative review of school-based childhood obesity prevention programs. *Journal of Pediatric Health Care*, 23(4), 242–258. doi:10.1016/j.pedhc.2008.04.008

PEDAGOGY

Effects of Music on Physical Activity Rates of Elementary Physical Education Students

David Barney and Keven A. Prusak

Abstract

Music is a pervasive presence in society and is routinely used to influence human behavior in a variety of settings and for a variety of purposes including exercise behaviors and physical education (PE) classes. However, little evidence exists to support what effect, if any, music has on learner outcomes in PE. The effects that playing music during elementary PE lessons had on children's physical activity (PA) rates were examined in this study. Physical activity rates (via pedometry) of elementary PE students (Grades 3 to 5, $n = 115$) were measured under two treatment conditions (music or no music) and across two lesson types (walking or Frisbee) in a crossover design. Data were analyzed using a within-and-within repeated measures ANOVA. Findings indicate that including music throughout PE lessons significantly increases PA for both genders and across both activities ($p < .000$). Also, a significant music-by-activity type interaction effect was noted ($p < .000$), indicating that music has an increased effect as the nature of the activity becomes more vigorous. A significant gender effect ($p < .000$) was also noted. Using music may be a beneficial environmental change that will increase PA in elementary PE and is more pronounced as intensity increases.

David Barney is associate professor, Teacher Education Department, Brigham Young University. Keven A. Prusak is associate professor, Teacher Education Department, Brigham Young University. Please send author correspondence to David Barney, 249G Smith Fieldhouse, Provo, Utah 84602. E-mail: david_barney@byu.edu

Music can be heard at the workplace, at the local mall—in just about any facet of a person's life. The effects of music have been studied with considerable interest in many fields, especially sport and exercise (Karageorghis, Jones, & Low, 2006; Pates, Karageorghis, Fryer, & Maryland, 2003; Priest-Lee, Karageorghis, & Sharp, 2004).

Karageorghis, Terry, and Lane (1999) conducted much of the research dealing with music in sport and exercise. Karageorghis et al. (1999) presented a conceptual framework predicting the effects of asynchronous (i.e., absent of conscious synchronization between physical movement and accompanying musical rhythm) motivational (i.e., stimulates or inspires physical activity) music in the context of exercise and sport. From previous work and a review of literature, four factors have been identified that contribute to the motivational qualities of a given piece of music: rhythm response, musicality, cultural impact, and association. Rhythm response is the response to the rhythmical elements of music—the key characteristics of music for eliciting a bodily response. Musicality is the response to the pitch-related elements of music such as harmony and melody. Cultural impact is the pervasiveness of the music within society (i.e., the more culturally central is music within society). The association factor is the personal music association that may evoke bodies to be physically active. The four factors were different in the extent to which they contributed to the motivational qualities of music with rhythm response found to exert the greatest influence on bodily responses and association the least. Karageorghis et al. (2006) proposed that asynchronous motivational music leads to three psychophysical responses, namely, arousal control, reduced ratings of perceived exertion (RPE), and improved mood. Karageorghis et al. (2006) provided practitioners with guidelines to facilitate the prescription of music that may ultimately impact exercise.

Researchers examining music in sport and exercise have investigated variables such as the effects of tempo during exercise (Priest, Karageorghis, & Sharp, 2004). For this study, participants at a health club were asked to respond to a survey assessing the type of music played at the health club. The results of the study indicated the members of the health club wanted a variety of louder music that was upbeat and motivational during their workout.

Accordingly, Karageorghis et al. (2006) investigated the relationship between heart rate and music tempo. College-aged students ($n = 128$) picked their top-three artists for use in the study and then walked on a treadmill at three levels of intensity while wearing a

heart rate monitor and listening to the selection of music. Overall, results indicated (a) that fast-tempo music was preferred and (b) and increased preference for fast-tempo music accompanied increases in workload intensity. Similarly, Copeland and Franks (1991) compared music with a soft, slow tempo to music with an upbeat, fast tempo. Results indicated that the exercise group listening to the soft, slow tempo music generally exhibited a lowered heart rate compared with an exercise group that listened to upbeat, fast-tempo music.

Although researchers have investigated the effects of music and tempo on the physical activity (PA) behaviors of exercisers in commercial settings, little has been done in the physical education (PE) setting. This is surprising for two reasons. First, music is not an uncommon component of public school PE offerings, particularly in weight training classes and elementary PE. Second, PE students represent perhaps the largest body of potential exercise participants in the United States.

Deutsch (2008), for example, investigated the effects of music on elementary-aged students being tested during the Progressive Aerobic Cardiovascular Endurance Run (PACER) test. Sixty-nine fourth and fifth grade students (males, 37; females, 32) participated in this study. The PACER test is an age- and developmentally appropriate aerobic capacity fitness test recommended for all ages, but particularly for elementary-aged students. The Cooper Institute (2005) produces a CD that has three versions of the test: one with faster tempo music, one with a mild tempo, and one version without music. The results indicated that PACER scores increased in males and females when administered with music. Males performed better with mild-tempo music and females with the faster tempo music, and the authors of this study recommend using both. Furthermore, student comments indicated that they enjoyed participating more when music accompanied the test.

However, although it is hoped that the use of music in elementary physical education (EPE) will elicit specific behavioral responses in students (e.g., increased PA), it is most often used simply as an element of the content (e.g., the music that accompanies a dance or the timed music that assists in the time management of a fitness routine; Pangrazi, 2007). Although it appears that including music can affect PE students' PA behaviors in the PACER, its effects on PA behaviors throughout a lesson remain unexamined. Therefore, the purpose of this study was to examine the effects of using music on the PA rates (measured via pedometry) of elementary school children during entire physical education lessons.

Methods

Participants and Setting

Participants were 115 elementary-aged students (Grades 3 to 5; males, 48; females, 67) from an elementary school located in the southern plains of the United States. The EPE teacher in this study taught for 15 years. A typical lesson comprised four parts (Pangrazi, 2007): (a) an introductory activity, (b) a fitness activity, (c) the lesson focus, and (d) a game. The introductory activity is to prepare students for activity. In many cases, students have been sitting in classes previous to their physical education class, and thus students get quickly into activity through introductory activities. The introductory activities require minimal organization and place demands on large muscle movement. The fitness activity is next, which lasts 6 to 8 min. Typically, fitness activities are focused on developing physical fitness. Instruction is centered on developing major components of flexibility, muscular strength, and cardiovascular endurance. The lesson typically lasts 12 to 15 min, with the focus on the skill or activity for students to learn. The concluding game/activity takes the last 5 min of the lesson (Pangrazi, 2007).

Pedometer Instrument

One method of measuring the effects of music in EPE is with pedometers (Vincent-Graser, Pangrazi, & Vincent, 2009; Vincent & Pangrazi, 2002). Pedometers are practical, easy to use, and cost effective (Barfield, Rowe, & Michael, 2004; Beighle, Pangrazi, & Vincent, 2001; Welk, Corbin, & Dale, 2000) and have been found to be reliable and valid instruments to measure activity in EPE. The Yamaz Digi-Walker LS 2525 was the pedometer used to collect student step counts and time in activity (LeMasurier et al., 2005).

Procedures and Data Collection

Students participated in three 30-min EPE lessons per week. During the first of the preceding three PE lessons to data collection, students were introduced to the pedometer, shown how to wear it (Vincent & Pangrazi, 2002), and shown how to reset it to 0. For the next two lessons, students practiced the procedure of coming into class, selecting a pedometer, resetting it to 0, and putting it on for the class activities. On the days of data collection, students repeated these procedures. Once all students had completed these procedures, the teacher would begin a 30-min lesson. When the lesson was fin-

ished, students would record the number of steps and time in activity. Only the teacher and the researchers had access to the student record sheet. Pedometer data were collected for two intact classes from each grade participating in a Frisbee lesson and walking activities lesson, each taught with and without music.

On the days when music was used, the teacher would play music throughout the lesson except when giving instruction. Instructions were designed to be kept to a minimum, and then the music was immediately turned back on. Instructions were also designed to be consistent across conditions.

Data Analysis

Data were analyzed using a 2 (conditions: music/no music) × 2 (activity types: walking/Frisbee) within-and-within repeated measures (RM) ANOVA. Step count via pedometry was the dependent variable. Mean step counts and standard deviations are displayed by condition, activity, gender, and overall in Table 1. Effect sizes (ES) were calculated using Cohen’s $d [(M_1 - M_2)/SD_{pooled}]$ (Cohen, 1990). The results of the RM ANOVA comparing the effects of music on both conditions and both activities are displayed in Figure 1. Overall gender effects were also examined using a one-way ANOVA.

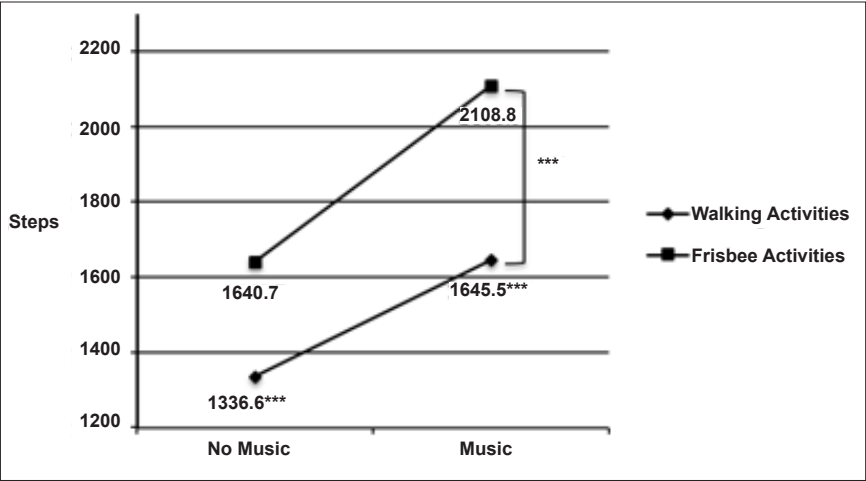


Figure 1. Mean steps taken in each lesson under each condition (no music and music) for each activity (walking and frisbee).

Results

Mean step counts indicated consistent gender-specific activity patterns, as is customary, with boys being significantly more active, $F(1, 128) = 12.48, p < .000$, across all conditions and activities (see bottom right in Table 1). Effect size calculations indicated a moderate gender effect ($ES = .47$).

Results from the RM ANOVA indicated that PA rates via step counts were significantly higher when (a) music was used, $F(1, 228) = 267.89, p < .000$, and (b) in different activities (walking vs. Frisbee), $F(1, 228) = 85.74, p < .000$. Also, an interaction effect was noted between using music and activity type with music exerting a significantly greater effect as the type of activity moved from the more sedate walking activities to the more vigorous Frisbee activities, $F(1, 128) = 13.717, p < .000$. Calculations revealed moderate (.41–.70) or large ($> .70$) effect sizes for music in the walking activities ($ES = .55$) and in the Frisbee activities ($ES = .74$) and overall ($ES = .81$), lending support to the notion that adding music to these activities had an important effect on PA rates.

Discussion

The purpose of this study was to examine the effects of using music on the PA rates (measured via pedometry) of EPE students. Deutsch (2008) used music only during the PACER test and found that male and female students' scores increased with music, whereas in the present study, it seems that music may also be used throughout the lesson, resulting in increased PA outcomes. Although music is somewhat common as an occasional curricular element in the public school setting, and even more so in EPE, its effects on student behaviors such as PA throughout the lesson have remained undetermined. In the present study, the same lessons were conducted with and without music, and this revealed important insights about the effects of music on PA rates.

First, regardless of the activity, students in lessons with music were more active. This was true in both the more sedate walking activities and the more vigorous Frisbee activities. Implications for teachers seem fairly straightforward—using music generally throughout the lesson and across a varied curriculum will have a positive effect on PA rates.

Next, one of the most interesting and potentially meaningful findings was the presence of a music-by-activity type interaction. The data indicate that as the intensity of the activity increases, the effects of the music become more pronounced. Karageorghis et al. (2006) had similar results with college-aged students walking on a treadmill at three levels of intensity. They found that fast-tempo music was preferred, and when students picked fast-tempo music, their workload intensity increased. The implications of this particular finding seem to indicate that when planning a lesson that includes activities of higher intensity, teachers should consider not only including music but also using music with a faster tempo.

Last, gender effects in this study were as expected; male students were more active than female students. These findings support those in many studies, in different settings, and with different populations (Sallis, 1993; Trost, 2001; Trost et al., 2002). Implications are similarly straightforward: Music is good for all.

References

- Barfield, J. P., Rowe, D. A., & Michael, T. J. (2004). Interinstrument consistency of the Yamax digi walker pedometer in elementary school-aged children. *Measurement in Physical Education and Exercise Science*, 8, 109–116.
- Beighle, A., Pangrazi, R. P., & Vincent, S. D. (2001). Pedometers, physical activity and accountability. *Journal of Physical Education, Recreation, and Dance*, 72, 16–19, 36.
- Cohen, J. (1990). Things I learned (so far). *American Psychology*, 45, 1304–1313.
- The Cooper Institute. (2005). *PACER CD* [CD]. Available from <http://www.cooperinstitute.org/fitnessgram>
- Copeland, B. L., & Franks, B. D. (1991). Effects of types and intensities of background music on treadmill endurance. *The Journal of Sports Medicine and Physical Fitness*, 31(1), 100–103.
- Deutsch, J. (2008). *The effects of music on the progressive aerobic cardiovascular endurance run (P.A.C.E.R) tests results on elementary aged students* (Unpublished doctoral dissertation). North Dakota State University, Fargo.
- Karageorghis, C. I., Jones, L., & Low, D. C. (2006). Relationship between exercise heart rate and music tempo preference. *Research Quarterly for Exercise and Sport*, 77, 240–250.

- Karageorghis, C. I., Terry, P. C., & Lane, A. (1999). Development and initial validation of an instrument to assess the motivational qualities of music in exercise and sport: The Brunel music rating inventory. *Journal of Sports Sciences*, 17, 713–724.
- LeMasurier, G. C., Beighle, A., Corbin, C. B., Darst, P. W., Morgan, C., Pangrazi, R. P., . . . Vincent, S. D. (2005). Pedometer-determined physical activity levels of youth. *Journal of Physical Activity and Health*, 2, 159–168.
- Pangrazi, R. P. (2007). *Dynamic physical education for elementary school children* (15th ed.). San Francisco, CA: Benjamin Cummings.
- Pates, J., Karageorghis, C. I., Fryer, R., & Maryland, I. (2003). Effects of asynchronous music on flow states and shooting performance among netball players. *Psychology of Sport and Exercise*, 4, 415–427.
- Priest-Lee, D. L., Karageorghis, C. I., & Sharp, N. C. C. (2004). The characteristics and effects of motivational music in exercise settings: The possible influence of gender, age, frequency of attendance, and time of attendance. *The Journal of Sports Medicine and Physical Fitness*, 44, 77–86.
- Sallis, J. F. (1993). Epidemiology of physical activity and fitness in children and adolescents. *Critical Review of Food Science and Nutrition*, 33, 403–408.
- Trost, S. G. (2001). Objective measurement of physical activity in youth: Current issues, future directions. *Exercise and Sport Science*, 29, 32–36.
- Trost, S. G., Russell, R. R., Sallis, J. F., Freedson, P. S., Taylor, W. C., Dowda, M., & Sirard, J. (2002). Age and gender differences in objectively measured physical activity in youth. *Medicine & Science in Sports & Exercise*, 34, 350–355.
- Vincent, S. D., & Pangrazi, R. P. (2002). Does reactivity exist in children measuring activity levels with pedometers? *Pediatric Exercise Science*, 14(1), 56–63.
- Vincent-Graser, S., Pangrazi, R. P., & Vincent, W. J. (2009). Step it up: Activity intensity using pedometers. *Journal of Physical Education, Recreation, & Dance*, 80, 22–24.
- Welk, G. J., Corbin, C. B., & Dale, D. (2000). Measurement issues in the assessment of physical activity in children. *Research Quarterly for Exercise and Sport*, 71, 59–73.

PEDAGOGY

Effects of a Peer-Administered Token Economy on Second Grade Physical Education Students' Overhand Throw Performance

Andrew E. Alstot

Abstract

Token economies have been shown useful in a variety of settings to improve physical activity-related behaviors. However, few researchers in empirical research have examined the effects of token reinforcement targeting motor skill performance implemented specifically in physical education with typically developing children. Therefore, the purpose of this study was to examine the effects of a token economy on the overhand throw performance of second grade physical education students. An alternating treatments design was used with students participating in overhand throwing sessions that alternated between baseline and token economy phases. Performance scores for each session were inspected for response differentiation between the two phases. In analysis, it was revealed the token economy was effective in all seven participants. Additionally, participants increased the number of overhand components performed correctly during token phases by 10% to 27% per session. A functional relation between token reinforcement and overhand throw performance was evident in most participants. Therefore, it was concluded that token reinforcement can be an effective tool for physical educators.

Andrew E. Alstot is assistant professor, Department of Exercise Science, Pacific University. Please send author correspondence to Andrew E. Alstot, Department of Exercise Science, UC Box A154, Pacific University, 2043 College Way, Forest Grove, OR 97116. E-mail: aalstot@pacificu.edu

Physical education (PE) teachers have ample responsibilities as educators. Of these responsibilities, one of the most important in their job description is to help their students develop competency in a variety of motor skills. As described in Standard 1 of the National Standards for Physical Education, a physically educated person “demonstrates competency in motor skills and movement patterns needed to perform a variety of activities” (National Association for Sport and Physical Education [NASPE], 2004, p. 11). Additionally, achieving competency in motor skills has further importance. According to Pangrazi and Beighle (2011), PE students’ motor skill success should be at a high level. It has been suggested that if students’ success rate is high, they may be more likely to find physical activity to be an enjoyable experience. However, if achievement is low, they may develop an aversion to PE and physical activity that may continue into adulthood (Pangrazi & Beighle, 2011). Further evidence supports the importance of the development of motor skills as well. Stodden, Langendorfer, and Robertson (2009) found a relationship between young adults’ competence in three motor skills (i.e., throwing, kicking, and jumping) and their overall fitness. These findings indicate that developing motor skills during childhood may have a positive impact on physical activity levels into young adulthood. Based on these rationales, strategies to increase student achievement and aid in the teaching of motor skills in PE should be of great value to physical educators. One strategy that may be valuable to physical educators is the token economy; however, few researchers have examined the effectiveness of token systems implemented specifically within PE classes. Therefore, in this study, the effectiveness of a token economy on the technique second grade PE students use to perform the overhand throw, one of the skills Stodden et al. found to be associated with higher fitness levels in young adults, was examined.

Behavior Analysis in Physical Education

One theoretical perspective that has been explored in the PE literature has its foundations in behavior analysis (Ward & Barrett, 2002). Interventions based in behavior analysis have been used in PE and other physical activity settings, such as sport or recreation, to modify skill-related behaviors methodically, including skills in tennis (Ziegler, 1987), volleyball (Ward, Crouch, & Patrick, 1998), basketball (Ward, Smith, Makasci, & Crouch, 1998), striking (Johnson & Ward, 2001), football (Smith & Ward, 2006; Ward & Carnes,

2002), soccer (Rush & Ayllon, 1984), track and field (Shapiro & Shapiro, 1985), and gymnastics (Wolko, Hrycaiko, & Martin, 1993). Teaching and coaching techniques based in behavior analysis have a well-established foundation in PE and sport literature.

Token Systems in Physical Education

One technique that has its foundations in applied behavior analysis is the token economy system. Originally developed as a motivational tool for use in a rehabilitation setting (Ayllon & Azrin, 1968), token economies consist of (a) an operationally defined behavior targeted for change; (b) tokens, tickets, or points to be rewarded to individuals when they engage in the target behavior (or when they do not engage in the behavior if it is one targeted for reduction); and (c) a selection of backup reinforcers for which individuals can exchange their earned tokens (Cooper, Heron, & Heward, 2007). Specifically within PE settings, the implementation of a token system has several recommended benefits: (a) unlike traditional tangible reinforcement, token reinforcement does not interrupt the educational process (Rushall & Siedentop, 1972); (b) tokens can be administered immediately following engagement in the behavior without interrupting educational activities, while delaying tangible reinforcement until a convenient time (Lavay, French, & Henderson, 2006); (c) by having available backup reinforcers from which to choose, the chance of satiation on a single reinforcer is reduced (Rushall & Siedentop, 1972); and (d) individual students are likely to find at least one item in the token store with reinforcing properties, thereby servicing the diverse student body found within a singular class (Alstot, 2012).

Token economies have been found useful in several physical activity settings to improve behaviors, including attention and time on task (Mangus, Henderson, & French, 1986; Reitman, Hupp, O'Callaghan, Gulley, & Northrup, 2001), exercise and physical activity behaviors (Alstot, 2012; Bernard, Cohen, & Moffett, 2009; DeLuca & Holborn, 1985, 1990, 1992), distance walked (Wiggam, French, & Henderson, 1986), and 1-mile walk/jog times (Trocki-Ables, French, & O'Connor, 2001). Despite the recommendations for implementing token economies in PE (Alstot, 2012; Lavay et al., 2006; Rushall & Siedentop, 1972) paired with the successes reported in a wide variety of physical activity behaviors and settings, only two studies were identified in which the effectiveness of a token system implemented specifically within a PE setting was examined.

Mangus et al. (1986) introduced a token economy in an integrated PE class; however, their target population was children diagnosed with autism, and Alstot (2012) implemented a token system to increase jump rope activity of elementary students. Therefore, no studies were found in which a token system implemented in a PE setting with typically developing students that targeted a specific skill-related behavior was examined. Consequently, the primary purpose of the current study was to examine the effectiveness of a token economy on typically developing elementary PE students' technique used to perform an overhand throwing skill. Overhand throw was selected as the target behavior due to the complexity of the task that involves several sequential steps in the correct execution of the skill.

A secondary purpose of the study was to examine the effect reinforcing correct overhand throw technique had on the result of the throw (i.e., throw distance). It is believed that correctly performing the process of the overhand throw will positively impact the product of the throw. Finally, the purpose of this study was also to examine the accuracy with which elementary-aged PE students administered token reinforcement and process assessments to their peers. Ward and colleagues (Crouch, Ward, & Patrick, 1997; Ward, Crouch, & Patrick, 1998; Ward, Smith, et al., 1998) conducted a series of behavior analysis-based studies using elementary-aged peers to assess performance in PE, and Mangus et al. (1986) and Alstot (2012) used peers to administer token reinforcement. In each case, the peers were able to assess and/or reinforce with a high degree of accuracy. These were combined in the current study to examine the accuracy with which elementary-aged students can perform a peer assessment and administer reinforcement based on the results of the assessment.

Method

Participants

Participants were chosen from an intact second grade PE class. Informed consent was sought from each student's legal guardian, and informed assent was obtained from each student. From the class, seven students (four girls, three boys) were selected as participants. Participants were given pseudonyms. The university institutional review board approved the procedures of this study.

Setting and Personnel

Most of the 10 sessions were conducted in the gymnasium of a suburban elementary school located in the southeastern United States. However, two sessions had to be moved outside to the outdoor tennis courts at the school due to events being held in the gym at the school (e.g., book fair, school assembly). The class had PE instruction approximately once per week. Personnel involved in implementing the study included the PE teacher—a female with 8 years of teaching experience, who implemented the token economy and conducted all sessions—and the researcher, who was present during all sessions to collect relevant data.

Data Collection and Equipment

Each of the 10 sessions was recorded using a Kodak Zi6 Pocket video camera. Additional equipment included five bean bags for each student in the class, tokens (i.e., .75-in. Bingo “coins”) to be distributed during the intervention, a personalized container (i.e., 4-in. square plastic containers, each with a removable lid with a 1-in. hole for easy token administration) for each student’s tokens, and a selection of backup reinforcers (e.g., balls, yo-yos, glow sticks, stickers) available for purchase in the token store.

Experimental Design and Procedures

An alternating treatment design (Barlow & Hayes, 1979) was used to evaluate the effectiveness of the token economy. In an alternating treatments design—a single-subject design variation—treatment conditions are implemented on an alternating schedule to assess whether levels of the target behavior are different under the varying conditions. This design was selected because single-subject research design is used in all behavior analysis–based research (Kennedy, 2005) due to behavior being viewed as an individual phenomenon in this theory (Skinner, 1953) wherein individual responses to implementing an intervention would be lost if traditional group designs and statistics were used. In alternating treatment designs, a functional relation can be determined if response differentiation occurs between the two conditions (Kennedy, 2005).

Experimental conditions. The baseline and token economy experimental conditions are described in the following section. On most occasions, two data collection sessions were conducted each day the class met, one at the beginning of the class and one at the end, with a condensed version of the teacher’s PE lesson in between.

These lessons were not a part of the study and did not involve overhand throw tasks (i.e., during these lessons, the teacher provided instruction on other topics, such as gymnastics and fitness). Before the class entered the gym, the researcher randomly selected which condition was to be implemented at the beginning of the class. The opposing condition was then executed at the end of the class. This strategy was used to ensure an equal number of baseline and token economy sessions. Each session took approximately 5 min.

Baseline. The teacher gave instruction on the proper technique of performing an overhand throw as she usually would during a typical PE class. The researcher then divided students in the class into pairs. While one member of the pair performed five trials of the overhand throwing task, the partner used a peer process assessment to assess the form his or her partner used to perform the skill. The process assessment consisted of two components: (1) side to target and (2) step toward target with opposite foot (Graham, Holt/Hale, & Parker, 2007). On the assessment sheet, the partner placed an *X* next to the component(s) the thrower performed correctly for each of the five trials during the session. After each participant performed five trials, the partners switched roles and the process was repeated, giving each student in the class the chance to perform five throws as well as conduct the peer assessment.

During the activity time, the teacher only gave feedback to the observers who were conducting the assessment regarding the accuracy with which the assessment was being conducted. Corrective or positive feedback was not given to the students who were performing the overhand throw task. The teacher only gave a minimal amount of feedback regarding the accuracy of the assessment; the participants were able to understand the assessment process quickly and accurately.

Token economy. During the intervention phase, the participants followed a similar procedure as was followed during the baseline sessions, with the addition of the administration of token reinforcement. Each participant performed five trials of the skill while his or her partner performed the process assessment. After each trial, if the participant performed both of the components of the skill correctly, the partner picked up two tokens (i.e., one token for each correctly performed component of the skill) from a plastic cup that contained a large amount of tokens and placed them in the thrower's personalized token container that was located on the ground near where the task was being performed. If only one of the components was

performed correctly, one token was awarded. No tokens were given for incorrect performance of both components. Participants had an opportunity to earn up to 10 tokens during each token economy session. Throughout the study, the participants did not remain with the same partner. Pairs were exchanged four times, resulting in each participant having five partners throughout the study.

Students had an opportunity approximately once a week to exchange their tokens for backup reinforcers in the “token store.” The teacher requested to forego a preference assessment that was to be administered to the participants. Instead, she suggested items that she believed to be of interest to the students; these items were purchased and used to stock the store. The store consisted of four bins, each containing backup reinforcers of different value: 5, 10, 15, or 20 tokens. Larger items, such as glow sticks and yo-yos, cost 20 tokens each, and smaller items, such as small stickers and erasers, cost 5. Students also had the option to retain their tokens for a later date to save up for more “expensive” items. Throughout the duration of the study (i.e., approximately two months), the operation of the store cost approximately 38 cents per student per month.

Teacher training. Prior to the onset of the intervention, the researcher conducted two 20-min training sessions with the PE teacher regarding the procedures of the study. Training sessions included verbal instructions and modeling of the procedures. The teacher’s competency of the study was assumed when she was able to completely describe the steps in implementing the components of the study with complete accuracy.

Token training. Prior to implementing the intervention, the teacher and researcher conducted a short token training session with the PE class. According to Cooper et al. (2007), token training with typically developing children can mainly consist of verbal instructions and modeling. Therefore, the teacher and researcher discussed with the class how they could earn tokens, modeled to them how tokens were to be distributed, and gave them an opportunity to see what was available for purchase in the token store. Token training was completed in one session that lasted approximately 10 min.

Assessment training. The teacher conducted two assessment training sessions with the students, each lasting approximately 5 min. These sessions consisted of a verbal description of how the assessment was to be conducted and a demonstration of correct and incorrect execution of the assessment. Training sessions also included the teacher performing the overhand throw skill while the

students completed an assessment of the teacher’s performance. The accuracy with which the participants assessed the teacher’s performance was evaluated by comparing the participants’ completed assessments to the researcher’s assessments of the teacher’s performance. Participants achieved the criterion of 80% accuracy within two training sessions.

Intervention integrity. For each token session, the researcher determined if the intervention was administered correctly by calculating the absolute percent error (APE) of token distribution; APE was calculated by subtracting the criterion amount (how many tokens the participant should have received for the session) from the actual amount (how many tokens the participant actually received), dividing by the criterion amount and multiplying by 100. The resulting APE represents the percent error with which tokens were administered to each participant for each session. The mean absolute percent error (MAPE) was then calculated for each participant, providing insight into the accuracy with which tokens were administered across sessions. Only one participant, Mary, received tokens with greater than 10% error. All other participants were administered tokens with a high degree of accuracy. The MAPE for each participant across all token sessions is displayed in Table 1.

Table 1
*Accuracy With Which Participants Were Assessed
and Administered Tokens*

Participant	Token sessions assessed accuracy (%)	Baseline sessions assessed accuracy (%)	Assessed accuracy across all sessions (%)	MAPE of token administration (%)
Alexis	100.00	92.50	96.25	0.00
Connie	100.00	92.00	96.00	0.00
Carly	100.00	96.67	98.33	0.00
Mary	88.00	80.00	84.00	32.00
Larry	90.00	86.00	88.00	10.00
Jack	94.00	80.00	87.00	6.00
Chris	100.00	88.00	94.00	0.00

Note. MAPE = mean absolute percent error.

Social validity. After the close of the intervention, a questionnaire was given to the PE teacher to evaluate her perception of the intervention as well as her opinion regarding the practicability of using token economies in a PE setting. The questionnaire was also used to inquire of the teacher's perception of the costs of implementing the token economy as well as her intentions of implementing a token system in her future PE classes.

Data Analysis

Overhand throw technique was evaluated using the following criteria, adapted from Graham et al. (2007): (1) Participant positions his or her body perpendicular to the target with the side of the body opposite of the throwing arm facing the target (side to target); (2) participant takes a long contralateral step toward the target with the foot opposite of the throwing arm (step with opposite foot); (3) throwing arm moves in a rotational motion back with the hand behind the head and then toward the target with the elbow at or slightly above shoulder level (arm way back and throw); and (4) after the ball is released, the arm should continue in an arc and end up near the knee (follow through). The researcher observed video recordings of each session in slow motion, analyzing the overhand throw technique based on the criteria described above. For each of the four components of the skill performed correctly, the researcher gave 1 point; 4 points were possible per trial (i.e., 1 point per component of the skill). Each session consisted of five trials. Twenty points were possible for each session.

For each trial, the distances thrown were evaluated via video data. The students were instructed to try to throw the bean bag as far as they could while maintaining correct technique. In the gymnasium, strips of tape were placed at 1-ft intervals along the side of the wall. While observing each session in slow motion, the researcher paused the video at the point where the bean bag initially hit the floor. The bean bag's location was then compared to the markings on the gym wall and rounded to the nearest foot. A similar technique was used during outside sessions. Cones were placed at regular intervals along the side of the tennis court. The location of the bean bag was compared to the marker cones and rounded to the nearest foot.

Interobserver agreement. Interobserver agreement (IOA) was assessed for approximately 27% of the sessions. While watching the recorded videos, a trained independent observer coded each of the

four components of each practice trial as correct or incorrect. Percentage agreement was calculated by dividing the total number of agreements by the total number of agreements plus disagreements and multiplying by 100%. Overall agreement was 91.8%. Additionally, the observer recorded the distance thrown for each trial and calculated the average distance per session for each participant. The mean difference between the researcher's and second observer's distance per session was less than 2 ft (i.e., 1.6 ft per session).

Assessment accuracy. The accuracy with which participants were assessed by their peers was analyzed for all sessions, including baseline and token economy sessions. Accuracy was calculated for each participant for each session by dividing the number of correctly assessed components of the overhand throw by the correctly assessed components plus incorrectly assessed components and multiplying by 100%. Participants' assessment accuracy data are shown in Table 1.

Results

Overhand Throw Components Performed Correctly

Visual analyses of the line graphs reveal that all seven participants showed response differentiation between baseline and token economy sessions. Mary had two sessions (one token economy and one baseline; Sessions 7 and 8, respectively) that deviated from the trends typical to the remainder of her data. During these sessions, she was assessed and administered tokens with a high degree of inaccuracy. If these two data points are removed due to the inappropriate administration of tokens and feedback, the trends indicate response differentiation as found in the other participants' data. Each participant's total number of overhand throw components performed correctly per session based on condition is shown in Figure 1. During Session 3, the first token economy session, participants showed an immediate improvement in overhand throw performance over baseline, indicating the effectiveness of the intervention.

Additionally, participants increased their mean number of overhand throw components performed correctly per session by at least two components compared with baseline sessions. Within these participants, mean improvement ranged from an increase of 2.0 components per session (i.e., Carly and Chris) to a mean of 5.0 (i.e., Jack). This represents a range of improvement within the participants from 10% to 27% from baseline to token conditions. Based on the re-

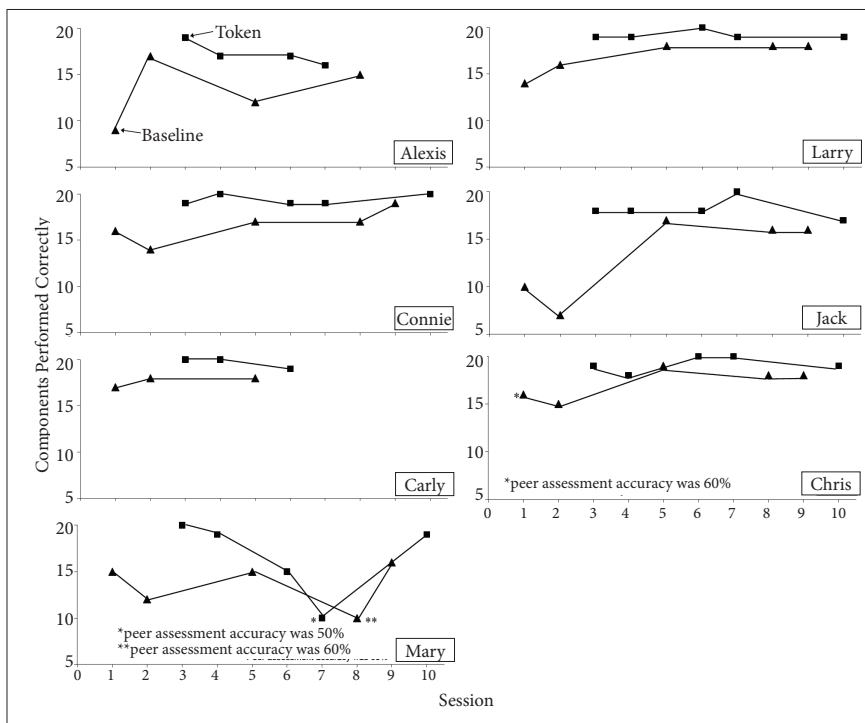


Figure 1. Number of overhand throw components performed correctly per session.

sponse differentiation evident in the graphs as well as the differences present in the number of correctly performed overhand throw components during token sessions, it can be determined that a functional relation between the administration of token reinforcement and an improvement in overhand throw performance is evident in each of the participants.

Distance Thrown

All seven participants showed an increase in mean distance thrown during token sessions compared with baseline sessions. Improvement ranged from an increase in 0.3 ft per throw (i.e., Larry) to 4.4 ft per throw (i.e., Alexis and Chris). The differences in the mean distance the participants threw the bean bags based on session type are represented in Figure 2. In further analysis, it was also revealed that, with only one exception, the mean throw distance across participants increased when tokens were introduced and then subsequently decreased when a baseline session was implemented.

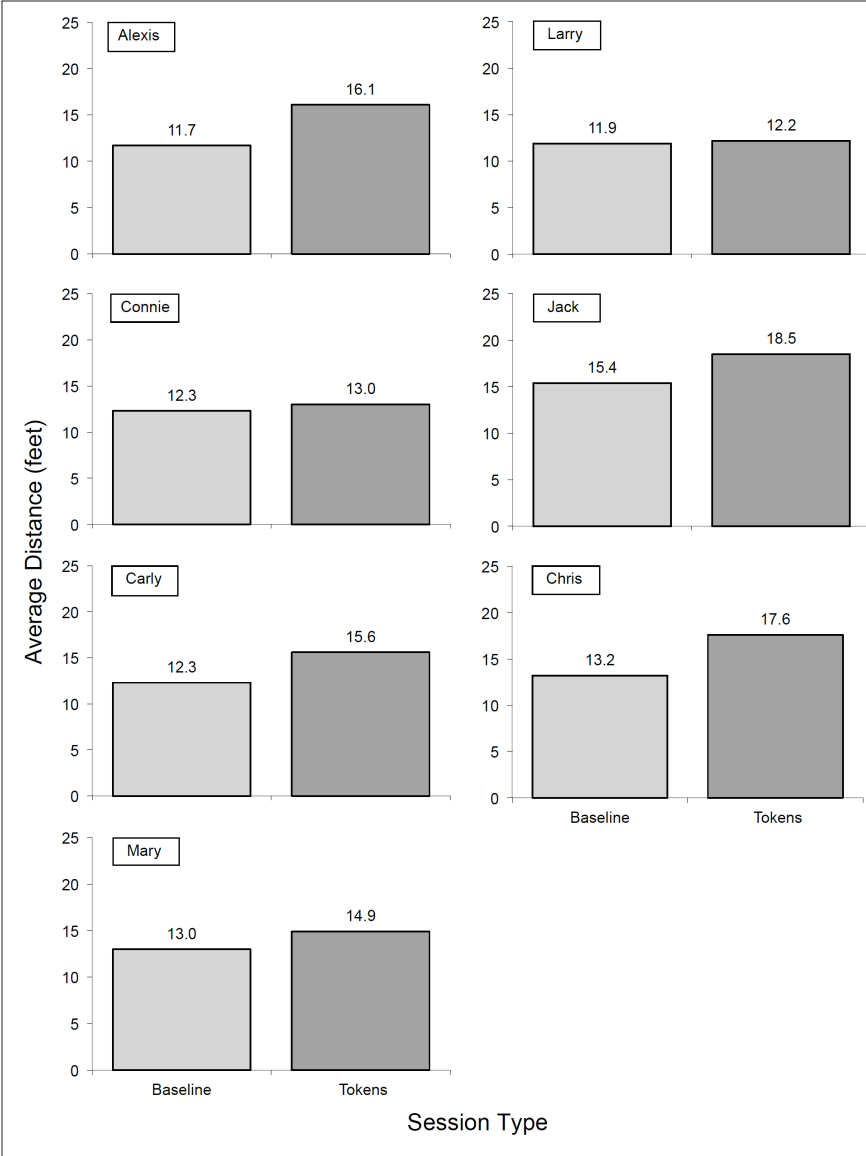


Figure 2. Average distance (in feet) of all throws based on session type.

Assessment and Token Distribution Accuracy

The accuracy with which each participant was assessed throughout the study is displayed in Table 1. Across all sessions, no participant was assessed with less than 85% accuracy. Although there may have been instances when a single session’s assessment accu-

racy was low, the overall accuracy was very high (i.e., above 85%). Assessment accuracy tended to be higher during token economy sessions (i.e., ranged from 88.0% to 100.0% accurate) than during baseline sessions (i.e., ranged from 80.0% to 100.0% accurate).

With the exception of Mary, the participants tended to receive tokens with a high degree of accuracy. The mean absolute percent error of token administration was calculated for each participant (Table 1). These data show that token distribution was completed with little error, indicating that peers were able to administer tokens accurately (i.e., peers gave tokens only for correct performance of the throwing task and not when their partners performed the task incorrectly). More than half of the participants (i.e., Alexis, Connie, Carly, and Chris) received tokens with complete accuracy (i.e., 0% error) throughout all token economy sessions, and the remaining participants, Larry and Jack, received tokens with 10% error or less.

Social Validity

The PE teacher responded to the social validity questionnaire with consistently favorable remarks. She felt that the token economy system was *very effective* in helping her students improve overhand throw skills and *very easy* to implement. Although she stated that the benefits of the token system were worth the cost of its implementation, she was only *somewhat likely* to use a token economy in the future due to the costs associated with the store.

Discussion

The main purpose of the current study was to examine the effectiveness of peer-administered token reinforcement on the technique second grade PE students use to perform an overhand throw skill. Results indicated that all seven participants showed response differentiation between baseline and token sessions. Based on the visual analysis of the graphs, it can be determined that implementing the token economy had a positive impact on the overhand throw behavior of the aforementioned seven participants. Researchers in the existing literature supported the use of token economies with children in physical activity settings across several capacities (DeLuca & Holborn, 1985, 1990, 1992; Reitman et al., 2001; Trocki-Ables et al., 2001). The results of the current study further these findings by extending the use of token systems into a PE class with typically developing children while targeting a specific motor skill-related behavior. Several recommendations for the use of token economies in

PE were available (Alstot, 2012; Lavay et al., 2006; Rushall & Siedentop, 1972), but empirical evidence for the use of these systems in PE classes was lacking in the literature. In the current study, it was revealed that implementing a token economy in a PE class can motivate students to use correct technique when performing motor skills.

As mentioned previously, each of the seven participants showed an improvement in overhand throw technique during the token condition; however, there was a peculiar occurrence during two of Mary's sessions (see Figure 1). Mary was assessed with a high degree of error during Sessions 7 and 8 (i.e., with 50% and 60% accuracy, respectively). During Session 7, Mary received tokens despite performing the skill incorrectly. Then, during Session 8, she received incorrect feedback (i.e., from her partner based on the peer assessment); that is, despite her incorrect performance of the skill, she was given positive feedback regarding her engagement in the components of the overhand throw. These incidents exemplify what Cooper et al. (2007) labeled the "arbitrariness of the behavior selected"; that is, despite the intended result, the behavior that immediately precedes a reinforcing consequence will be strengthened. In the current example, because Mary's behavior (i.e., incorrect skill execution) was immediately reinforced with tokens and/or with positive feedback via the assessment, the behavior continued. It was not until the proper behavior was reinforced during Session 9 that Mary increased correct execution of the overhand throw skill.

Participants were awarded tokens for correctly executing the first two components of the overhand throw skill (i.e., "side to target" and "step with opposite foot"). However, data from all four components of the skill (i.e., the first two components plus "arm way back and throw" and "follow through") were included in the data analysis, despite the intervention being focused only on the first two. When the first two components are analyzed separately from the second two, there is little or no response differentiation in the first two, which were specifically targeted by the token system. Most of the response differentiation between token and baseline sessions occurred in the second two components. It appears that with the introduction of token reinforcement, participants were able to generalize quickly performance of the first two components of the skill to baseline and token sessions, whether or not tokens were awarded. Specifically during token sessions, however, participants typically performed all four components more consistently than they did during baseline sessions. This may be explained by what Cooper

et al. (2007) labeled “behavioral momentum” or a “high-probability request sequence,” which are characterized by individuals performing a difficult task (or a task with a lower likelihood of compliance) immediately after completing a series of easier tasks (or tasks with higher incidence of compliance) for which they are reinforced. In the current study, performing a series of easier tasks (Components 1 and 2) with token reinforcement resulted in an increased likelihood of correct performance of the more difficult tasks (Components 3 and 4). Awarding tokens for correct performance of “side to target” and “step with opposite foot” had a behavioral momentum carryover effect on performance of the more difficult components of “arm way back and throw” and “follow through.” Based on this analysis, students may benefit when teachers reinforce the first step or two of a sequential skill such as throwing.

The secondary purpose of the study was to examine the effect the reinforcement of the technique participants used to perform the overhand throw had on the outcome of the throw (i.e., distance the bean bag traveled). The preliminary analysis indicated that sessions in which participants were reinforced with tokens for performing the skill correctly resulted in an improved product; that is, participants threw the bean bags farther when they received tokens for their correct performance. However, a more in-depth examination showed that the improvement in the product may have been more of a result of the cumulative number of appropriate responses over time; as the number of most participants’ correctly performed components accumulated, the trend in the distance the bean bags were thrown increased as well. Several researchers have demonstrated the relationship between practice trials using correct technique and student achievement in PE settings (Ashy, Lee, & Landin, 1988; Buck, Harrison, & Bryce, 1990; Silverman, 1985); however, in these studies, whole trials were used as the variable for examination. A preliminary indication of the current study is that student achievement may improve as a result of an accumulation of correctly performed components of a skill.

A tertiary purpose of the current study was to investigate the accuracy with which second grade students perform a peer process assessment and administer token reinforcement based on the results of the assessment. Within behavior analysis in PE literature, researchers have found evidence supporting the use of peer assessments (Crouch et al., 1997; Ward, Crouch, & Patrick, 1998; Ward, Smith, et al., 1998) and peer-administered token reinforcement (Alstot,

2012; Mangus et al., 1986). The results of the current study indicate that students as young as second grade can effectively and simultaneously perform a process assessment and dispense token reinforcement with a high degree of accuracy. The process of assessment training was simple. Two 5-min sessions were all that were necessary for participants to achieve the criterion of 80% accuracy during training. Then, throughout the duration of the study, with few minor prompts and quick verbal reminders of how to conduct the assessment from the teacher, the students were able to assess accurately the technique their peers used to perform an overhand throw. These findings provide evidence that, with relatively little training, lower elementary-aged students have the capability to assess and reward their peers' motor performance accurately. Therefore, all students in the class can receive immediate and individualized feedback from their peers regarding their skill performance as well as receive reinforcement for the correct execution of the skill, which can have a positive impact on the achievement of the student within the PE context.

Implementing token economy systems, however, is not without complication. Kazdin (1982) identified several barriers to the proper and effective execution of a token economy system, including issues related to administrative and organizational concerns. Despite the potential obstacles in its implementation, the token system in the current study was introduced with little difficulty, especially with the students administering the reinforcement. The responses the teacher provided on the social validity questionnaire indicated that the implementation of the token system was *very easy* and that it was *very effective* in helping her students learn the overhand throw skill. However, she was only *somewhat likely* to use a token system in future classes. She revealed that the major barrier to her future use was related to the costs associated with upkeeping the token store. She explained that although 38 cents per student per month seemed sensible, when multiplying that by the hundreds of students she sees weekly, the costs exceed what she considers reasonable. After a short discussion on this topic, she was willing to try a token system again in the future if more "inexpensive" backup reinforcers (e.g., line leader privileges, free choice time, choice of activities, other free or inexpensive items) were used to stock the store.

The main limitation associated with the current study is related to the amount of improvement participants showed over the baseline condition. Although most participants improved, it may be argued

that the difference between baseline and token session performance was not enough to make the token system worthwhile. This may have been more of a function of the boundaries confining the study. More specifically, the maximum performance participants could achieve during any given session was set at 20 points (i.e., 20 components performed correctly across five practice trials); therefore, a greater difference may not have been as evident as it may have been if a target behavior were selected that did not have a maximum performance level (e.g., throw distance). Despite this limitation, participants showed an average improvement of 3.02 overhand throw components performed correctly during the token sessions included in the study. It may, therefore, be assumed that if the token system were expanded to 10 or 20 sessions, the mean number of additional components performed correctly would jump to 6.63 or 13.25, respectively. In several seminal studies, correct practice in PE has been linked to achievement by students (Ashy et al., 1988; Buck et al., 1990). The increase in correct practice due to implementing a token economy across five, 10, or 20 sessions may be invaluable to the achievement of students within PE settings.

Further investigation into implementing token economies in PE needs to be conducted. The token economy implemented in the current study was shown useful with second grade students. However, additional token economy research should be conducted with an older population, such as middle or high school PE students. Also, preliminary evidence was revealed in the current study that an accumulation of correctly executed components of a skill performed over time may be associated with achievement; further examination is needed to confirm this result.

Conclusions

The results of the current study indicate that peer-administered token reinforcement can be useful in motivating typically developing elementary-aged students to perform skills correctly and increase achievement in PE. Also, the implementation of a token economy can be done with relative ease in a second grade PE class. Taken together, these two results indicate that the token economy can be an effective and appropriate tool for physical educators.

It was also revealed in this study that students as young as second grade can accurately perform a process assessment on their peers' motor performance, which has implications outside of token economy research. Teachers can use peer assessments with children

in PE with the assertion that students will be receiving a relatively accurate assessment of their performance.

References

- Alstot, A. E. (2012). The effects of peer-administered token reinforcement on jump rope behaviors of elementary physical education students. *Journal of Teaching in Physical Education, 31*, 261–278.
- Ashy, M. H., Lee, A. M., & Landin, D. K. (1988). Relationship of practice using correct technique to achievement in a motor skill. *Journal of Teaching in Physical Education, 7*, 115–120.
- Ayllon, T., & Azrin, N. (1968). *The token economy: A motivational system for therapy and rehabilitation*. New York, NY: Appleton.
- Barlow, D. H., & Hayes, S. C. (1979). Alternating treatments design: One strategy for comparing the effects of two treatments in a single subject. *Journal of Applied Behavior Analysis, 12*, 199–210.
- Bernard, R. S., Cohen, L. L., & Moffett, K. (2009). A token economy for exercise adherence in pediatric cystic fibrosis: A single-subject analysis. *Journal of Pediatric Psychology, 34*, 354–365.
- Buck, M., Harrison, J. M., & Bryce, G. R. (1990). An analysis of learning trials and their relationship to achievement in volleyball. *Journal of Teaching in Physical Education, 10*, 134–152.
- Cooper, J. O., Heron, T. E., & Heward, W. L. (2007). *Applied behavior analysis* (2nd ed.). Upper Saddle River, NJ: Pearson.
- Crouch, D. W., Ward, P., & Patrick, C. A. (1997). The effects of peer-mediated accountability on task accomplishment during volleyball drills in elementary physical education. *Journal of Teaching in Physical Education, 17*, 26–39.
- DeLuca, R. V., & Holborn, S. W. (1985). Effects of a fixed-interval schedule of token reinforcement on exercise with obese and non-obese boys. *The Psychological Record, 35*, 525–533.
- DeLuca, R. V., & Holborn, S. W. (1990). Effects of fixed-interval and fixed-ratio schedules of token reinforcement on exercise with obese and nonobese boys. *The Psychological Record, 40*, 67–82.

- DeLuca, R. V., & Holborn, S. W. (1992). Effects of a variable-ratio reinforcement schedule with changing criteria on exercise in obese and nonobese boys. *Journal of Applied Behavior Analysis*, 25, 671–679.
- Graham, G., Holt/Hale, S. A., & Parker, M. (2007). *Children moving: A reflective approach to teaching physical education* (7th ed.). New York, NY: McGraw-Hill.
- Johnson, M., & Ward, P. (2001). Effects of peer tutoring on correct performance of striking skills in 3rd grade physical education. *Journal of Teaching in Physical Education*, 20, 247–263.
- Kazdin, A. E. (1982). The token economy: A decade later. *Journal of Applied Behavior Analysis*, 15, 431–445.
- Kennedy, C. H. (2005). *Single-case designs for educational research*. Boston, MA: Allyn and Bacon.
- Lavay, B. W., French, R. W., & Henderson, H. (2006). *Positive behavior management in physical activity settings* (2nd ed.). Champaign, IL: Human Kinetics.
- Mangus, B., Henderson, H., & French, R. (1986). Implementation of a token economy by peer tutors to increase on-task physical activity time of autistic children. *Perceptual and Motor Skills*, 63, 97–98.
- National Association for Sport and Physical Education. (2004). *Moving into the future: National standards for physical education* (2nd ed.). Boston, MA: McGraw-Hill.
- Pangrazi, R. P., & Beighle, A. (2011). *Dynamic physical education for elementary school children* (16th ed.). San Francisco, CA: Benjamin Cummings.
- Reitman, D., Hupp, S. D., O'Callaghan, P. M., Gulley, V., & Northup, J. (2001). The influence of a token economy and methylphenidate on attentive and disruptive behavior during sports with ADHD-diagnosed children. *Behavior Modification*, 25, 305–323.
- Rush, D. B., & Allyon, T. (1984). Peer behavioral coaching: Soccer. *Journal of Sport Psychology*, 6, 325–334.
- Rushall, B. S., & Siedentop, D. (1972). *The development and control of behavior in sport and physical education*. Philadelphia, PA: Lea and Febiger.

- Shapiro, E. S., & Shapiro, S. (1985). Behavioral coaching in the development of skills in track. *Behavior Modification*, 9, 211–224.
- Silverman, S. (1985). Relationship of engagement and practice trials to student achievement. *Journal of Teaching in Physical Education*, 5, 13–21.
- Skinner, B. F. (1953). *Science and human behavior*. New York, NY: Macmillan.
- Smith, S. L., & Ward, P. (2006). Behavioral interventions to improve performance in collegiate football. *Journal of Applied Behavior Analysis*, 39, 385–391.
- Stodden, D., Langendorfer, S., & Robertson, M. A. (2009). The association between motor skill competence and physical fitness in young adults. *Research Quarterly for Exercise and Sport*, 80, 223–229.
- Trocki-Ables, P., French, R., & O'Connor, J. (2001). Use of primary and secondary reinforcers after performance of a 1-mile walk/run by boys with attention deficit hyperactivity disorder. *Perceptual and Motor Skills*, 93, 461–464.
- Ward, P., & Barrett, T. (2002). A review of behavior analysis research in physical education. *Journal of Teaching in Physical Education*, 21, 242–266.
- Ward, P., & Carnes, M. (2002). Effects of posting self-set goals on collegiate football players' skill execution during practice and games. *Journal of Applied Behavior Analysis*, 35, 1–12.
- Ward, P., Crouch, D. W., & Patrick, C. A. (1998). Effects of peer mediated accountability on opportunities to respond and correct skill performance by elementary school children in physical education. *Journal of Behavioral Education*, 8, 103–114.
- Ward, P., Smith, S. L., Makasci, K., & Crouch, D. W. (1998). Differential effects of peer-mediated accountability on task accomplishment in elementary physical education. *Journal of Teaching in Physical Education*, 17, 442–452.
- Wiggam, J., French, R., & Henderson, H. (1986). The effects of a token economy on distance walked by senior citizens in a retirement center. *American Corrective Therapy Journal*, 40, 6–12.

- Wolko, K. L., Hrycaiko, D. W., & Martin, G. L. (1993). A comparison of two self-management packages to standard coaching for improving practice performance of gymnasts. *Behavior Modification, 17*, 209–223.
- Ziegler, S. G. (1987). Effects of stimulus cueing on the acquisition of groundstrokes by beginning tennis players. *Journal of Applied Behavior Analysis, 20*, 405–411.

PEDAGOGY

An Examination of In-Class Physical Activity Across Games Classifications

Dana J. Perlman and Greg Forrest

Abstract

The purpose of this study was to examine the in-class physical activity opportunities across game classifications. A total of 221 (male, 100; female, 121) Year 9/10 physical education students were used within this study. Each student was engaged in four sport-based units (target, net/wall, striking/fielding, and invasion). Physical activity data were collected during each lesson using an accelerometer. For analysis of data, descriptive statistics were used to examine whether students met physical activity thresholds, and repeated measures ANOVAs were used to examine unit differences. Results indicated (a) none of the lessons met the percentage of time standard for quality physical activity and (b) significant differences between games classifications in regard to moderate to vigorous physical activity were identified. These results indicate that unit of study (i.e., different games classifications) should be considered when focusing on in-class physical activity.

The public health agenda has focused teachers and policy makers toward meeting physical activity (PA) benchmarks within physical education (PE) classes (U.S. Department of Health and Human Services [USDHHS], 2010). Currently, a commonly adopted thresh-

Dana J. Perlman is a senior lecturer, School of Education, University of Wollongong. Greg Forrest is a lecturer, School of Education, University of Wollongong. Please send author correspondence to Dana J. Perlman, University of Wollongong, Northfields Avenue, Wollongong, NSW 2522, Australia. E-mail: dperlman@uow.edu.au

old is that students should engage in a minimum 50% class time in moderate to vigorous physical activity (MVPA; USDHHS, 2010). The 50% MVPA criterion is deemed critical toward a student's exercise-related health, but there is the potential issue associated with the achievability when teaching diverse units of study in PE, in particular, when examining the breadth of units taught and the inherent PA opportunities under the concept of school-based sport. Therefore, the aim of this project was to provide initial data focused on students' in-class PA levels (i.e., total and moderate to vigorous) across sport units.

Physical Activity Opportunities and Physical Education

The concept of in-class PA levels has become a popular area of inquiry (USDHHS, 2010). Policy makers have indicated that in a quality PE program, students should be engaged in a minimum of 50% class time in health-enhancing levels of PA (USDHHS, 2010). Currently, much of the research focused within PE and the ability to meet current benchmarks or significantly change in-class PA patterns has dealt with interventions involving prescriptive units of instruction outside sport (Kahn et al., 2002). For instance, units of instruction focused within areas such as fitness/aerobics (Gortmaker et al., 1999; Harrell et al., 1996; Neumark-Sztainer, Story, Hannan, & Rex, 2003), gymnastics (Fairclough & Stratton, 2005), and whole school programs (McKenzie et al., 2004; Pangrazi, Beighle, Vehige, & Vack, 2003; Pate et al., 2005) have been used in interventions. The aforementioned studies have indicated initial results that students can meet PA benchmarks during PE lessons, but there seems to be a lack of research related to the area of sport. Although some researchers in their studies have used sport within their PA interventions, the examination of how diverse games and sports influence in-class PA was not a primary focus.

Teaching Sport and Games Within Physical Education

As teachers design, develop, and implement curricular options, the concept of games and sport continues to be a prevalent choice in school programs. For instance, in secondary PE programs, some form of one or a range of sports within the secondary curriculum is commonly implemented (United Nations Educational, Scientific, and Cultural Organization, 2010). Although games and sports are a

critical aspect of PE, it seems inconceivable that students can engage or experience each and every sport in their school career. As a result of the mismatch between limited class time and the number of sports available to study, one key trend within games and sport-based PE is the classification of games into four categories or classifications: target, net/court, striking and fielding, and invasion (Mitchell, Oslin, & Griffin, 2006). These classifications are based on common underlying game play principles as well as strategy and tactics that are common to the sports in each category (Bunker & Thorpe, 1983) and have been further expanded by authors such as Oslin and Mitchell (2006), Hopper (2003), and Memmert and Harvey (2010).

The classification of games and sports into categories (target, striking/fielding, net/court, and invasion) and the features of each game category have the capacity to provide a conceptualization of students' opportunities to engage in PA. Characteristics of the games and sports in each category provide plausible reasons for the conceptual differences associated with PA opportunities and could be attributed to (a) the intent of games and sports in each category and (b) the governing or primary rules that define the sports within each category (Gréhaigne, Richard, & Griffin, 2005). A description of information on (a) sports, (b) play principles, and (c) conceptualization of PA per games classification is provided in Table 1.

Table 1
Game Categories, Sample Sports, and Conceptualization of MVPA

Game category	Sample sports	Play principles	Conceptualization of MVPA
Target	Lawn Bowls Bocce	Place an implement closest to a target or goal	Low: High level of focus on cognitive aspects
Net/Wall	Tennis Squash	Place the implement in a spot that cannot be returned	Moderate: Quick bouts of movement with potential for slow restarts
Striking/ Fielding	Softball Cricket	Hit or strike a ball into a place that eludes opponents	Moderate: High potential for wait time

Table 1 (cont.)

Game category	Sample sports	Play principles	Conceptualization of MVPA
Invasion	Soccer Basketball	Move into opponents territory to score	High: Most players can be involved in game play

PA research focused within the area of games and sport has been broad. Researchers who have used sport as a mode of instruction to influence in-class PA have grouped sports together for convenience (e.g., target and invasion games housed under the same concept of sport). To date, a more micro-analysis of school sport whereby students engaged in a single unit of a sports category (i.e., invasion) has been used in two studies (Hastie & Trost, 2002; Perlman, 2013). The majority of these researchers have purposely used invasion sports due to the relatively low level of down time (e.g., quick restarts) and opportunities for all students to move. Although these researchers have provided empirical evidence toward meeting PA goals using the 50% MVPA threshold, the quality of PE programs relies on teaching a range of sports, including those under the target, net/wall, and striking/fielding categories. Therefore, the purpose of this study was to examine the in-class PA opportunities for secondary students across the spectrum of game categories. Specifically, this study was guided by the following research questions:

- How many games and sports lessons meet the 50% MVPA threshold?
- What is the influence of unit of study (i.e., games classifications) on in-class physical activity (i.e., total PA and MVPA)?

Method

Participants and Settings

A total of 221 (males, 100; females, 121) Year 9/10 PE students were used within this study. Students were from one public secondary school in the United States. Each student was engaged in four sport-based units (target, net/wall, striking/fielding, and invasion). Each unit of study was conducted over 10 lessons and adopted the skill–drill–game approach. Use of the skill–drill–game approach was due to the school curriculum and staff familiarity.

Contextualization of each unit was defined as follows: target – bocce, net/wall – badminton, striking/fielding – softball, and invasion – soccer. A sample unit plan for volleyball is provided in Table 2. During each unit, students were required to switch positions to allow for a more equal opportunity to engage in PA.

Table 2
Sample Block Plan of Volleyball

Day	Lesson content
1	Introduction to Volleyball Game Play (Needs Assessment)
2	Forearm Pass Skill Practice Game Play (6v6) “Forearm Pass Only”
3	Overhead Pass Skill Practice Game Play (6v6) “Forearm and Overhead”
4	Serve (Underhand) Skill Practice Game Play (6v6) “No Attacking”
5	Serve (Overhand) Skill Practice Game Play (6v6) “No Attacking”
6	Spike and Dink Skill Practice Game Play (6v6)
7–9	Tournament
10	Championship Games Awards

Measuring Physical Activity

At the beginning of each PE lesson, students were asked to wear an ActiGraph GT1M Accelerometer. The ActiGraph GT1M was placed on the waist at the right hip and supported by an elastic band. As students engaged in activity, the GT1M were used to collect data as a measure of activity intensity and duration measured in 10-s counts. Data were downloaded into ActiWeb Software and cal-

culated into metabolic equivalents (METs). METs were a measure of activity and categorized into time spent in total physical activity (TPA; ≥ 1 METs) and MVPA (≥ 3 METs; Trost, Loprinzi, Moore, & Pfeiffer, 2011). Trost et al. (2011) indicated that accelerometers may be used to get an objective and valid assessment of physical activity. Students wore the same accelerometer throughout the study to alleviate the issue with interaccelerometer variability.

Data Collection

Before the study began, approval from university ethics committee was granted, as well as appropriate consent from each participant/guardian. During the first week of school, students were taught about the accelerometers and how to wear them. When the study began, students were asked to wear the accelerometer for the length of each PE class. PA data were collected on a daily basis and downloaded into the mobile physical activity kit. The mobile physical activity kit housed all the accelerometers, accessories, and laptop.

Data Analysis

Data from each accelerometer were downloaded into the Acti-Web software to determine the amount of time spent in TPA and MVPA per lesson. TPA and MVPA cut points were based on the recommendations of Trost et al. (2011). As a result, each student was provided an overall amount of time spent within each dependent variable per day (i.e., TPA and MVPA). Further analysis of data was conducted in four stages. First, lesson (e.g., time spent in TPA during Lesson 1) and unit (e.g., average time spent in MVPA throughout the 10 lessons) descriptive statistics (mean and standard deviation) were calculated. Second, to examine the number of days that met the MVPA threshold, a percentage of lessons per unit was calculated using the following: $[\text{Number of Days} = (\text{Number of Days Above } 50\% \text{ MVPA} / \text{Number of Days in Unit}) \times 100]$. Third, intraclass correlation coefficients (ICCs) were calculated to identify the appropriate unit of analysis (individual or class). Fourth, to examine differences between units, two repeated measures ANOVAs were calculated for TPA and MVPA. A Bonferroni adjustment was used due to multiple ANOVAs ($p \leq .025$). Pairwise comparisons were calculated for all significant ANOVAs to examine where significant differences were located between units of study.

Results

Descriptive statistics (mean and standard deviations) by lesson and unit for dependent variables are displayed in Tables 3 to 5. A total of 0 days were identified as meeting or exceeding the 50% threshold for students engaging in MVPA. ICCs for all dependent variables were negative, and per the recommendation of Kenny and LaVoie (1985), the individual was used as the level of analysis. With the repeated measures ANOVAs, an insignificant effects was revealed for TPA, $F(3, 218) = 3.53$, $p = .016$, $\eta^2 = .046$, and significant differences were found for MVPA between games classifications, $F(3, 218) = 2067.98$, $p = .000$, $\eta^2 = .966$. Follow-up pairwise comparisons are illustrated in Table 6 and show that significant differences occurred between all compared units of study.

Table 3

*Descriptive Statistics (Mean and Standard Deviation)
of TPA per Lesson*

Day	Target		Net/Wall		Striking		Invasion	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1	31.7	6.60	32.3	5.48	30.7	6.45	32.7	5.76
2	31.7	6.75	31.9	5.78	30.4	6.77	32.5	6.12
3	31.6	6.29	32.0	4.65	30.6	5.81	32.6	5.11
4	32.1	6.47	32.7	5.15	31.6	6.39	33.2	5.60
5	31.5	6.36	31.9	5.38	30.6	6.43	32.6	5.76
6	31.8	6.51	32.1	5.00	30.6	6.11	32.6	5.48
7	31.2	6.89	31.5	5.97	30.2	6.79	32.2	6.35
8	31.5	6.69	32.0	5.46	30.6	6.48	32.6	5.84
9	31.8	6.63	32.2	5.36	30.6	6.51	32.7	5.79
10	31.9	6.42	32.7	5.32	30.8	6.54	32.8	5.81

Note. Each class lasted 50 min.

Table 4

*Descriptive Statistics (Mean and Standard Deviation)
of MVPA per Lesson*

Day	Target		Net/Wall		Striking		Invasion	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1	1.33	1.36	5.71	2.84	2.97	2.46	9.84	5.02
2	1.30	1.31	5.69	3.48	2.71	2.96	10.94	4.31

Table 4 (cont.)

Day	Target		Net/Wall		Striking		Invasion	
	M	SD	M	SD	M	SD	M	SD
3	1.19	1.29	6.65	2.87	3.20	2.54	12.24	3.41
4	1.31	1.31	6.58	3.44	3.74	3.89	13.30	4.95
5	1.28	1.19	6.18	3.29	3.37	3.58	12.51	3.11
6	1.32	1.36	6.23	3.07	3.88	2.93	14.21	4.97
7	1.32	1.36	5.18	2.59	3.76	2.82	12.93	5.57
8	1.32	1.36	6.23	3.07	3.44	2.51	12.24	3.84
9	1.31	1.37	5.48	2.82	5.24	4.18	11.76	5.81
10	1.32	1.37	6.28	1.92	4.53	3.32	10.66	4.38

Note. Each class lasted 50 min.

Table 5

Descriptive Statistics (Mean and Standard Deviation) of TPA and MVPA per Unit

Unit	TPA		MVPA	
	M	SD	M	SD
Target	31.67	6.24	1.30	1.31
Net/Wall	32.06	5.02	6.02	0.92
Striking	30.67	6.20	3.69	1.83
Invasion	32.68	5.54	12.06	1.67

Table 6

Pairwise Comparison of MVPA Between Games Classifications

I	J	Mean difference (I-J)	SE	Sig.	Lower bound	Upper bound
Target	Net/Wall	-4.722	.113	.000*	-5.022	-4.421
Target	Striking	-2.386	.156	.000*	-2.801	-1.972
Target	Invasion	-10.765	.139	.000*	-11.136	-10.394
Net/Wall	Striking	2.336	.136	.000*	1.974	2.697
Net/Wall	Invasion	-6.043	.127	.000*	-6.381	-5.706
Striking	Invasion	-8.379	.167	.000*	-8.823	-7.935

* $p \leq .025$.

Discussion

The emphasis of this study was to examine in-class PA opportunities of secondary students across multiple sport-based PE units. Specifically, the following were examined in this study: (a) the degree by which students met the 50% threshold for engaging in MVPA in each lesson and (b) whether there were significant differences across games classifications (e.g., target, invasion) of students engaging in both physical movement (i.e., TPA) and MVPA. Results indicated that in all lessons, no matter the type of sport, students did not meet the 50% MVPA threshold. In addition, a significant difference was found among games classifications in terms of MVPA.

Findings from this study support that through sport-based PE, students tend to participate in a severely low level of health-enhancing in-class PA. This supports the position statement of the USDHHS (2010) whereby students are not engaging in high levels of in-class PA. In previous studies whereby in-class PA has been the focus, the lack of TPA and MVPA has been attributed to the design and development and implementation of activities that do not allow for adequate PA (Hattie, 2009; Rink & Hall, 2008). To this resolve, the authors share the aforementioned rationales for limited in-class MVPA, yet also suggest that inherent opportunities within each sport influence the degree by which students can engage in MVPA.

The result that students were below the 50% MVPA threshold in all lessons was interesting. This result supports the notion that students are not engaged in MVPA at or above 50%. A plausible reason for the alarmingly low amount of time spent in MVPA could be the unit of instruction (e.g., net/court) or the instructional approach (skill–drill–game). Models-based instruction, such as sport education, have been shown to influence students' level of in-class PA positively (Hastie & Trost, 2002; Perlman, 2012, 2013), although invasion sports were used as the mode of investigation in these studies.

The second significant finding is associated with differences between games classifications. Within this study, results indicated that students were most likely to be involved in higher levels of MVPA during invasion games. This result supports the notion identified by Hastie and Trost (2002) whereby they used the invasion sport of basketball due to the perception of allowing for more engagement in PA. Similar to Hastie and Trost, it is believed that invasion-type sports inherently allow more opportunities to engage in health-enhancing PA due to aspects such as quicker restarts of play.

The results of this study indicate that more research is needed to understand the PA and educational paradigm within school-based PE. The implementation of a 50% MVPA threshold as part of a quality PE program may need more research support. It seems that (a) some sports do not inherently allow students to engage in high levels of MVPA, and (b) the need for students to engage in learning activities (e.g., cognitive) that may take away from activity time, yet lead to increased PA outside the class setting may need to be considered. Secondary sport-based PE encompasses a wide scope of activities and units of study. As such, teachers may need to be provided PA benchmarks to consider these variables. For example, target-type sports may be viewed as effective if they can be used to meet the 10% MVPA criteria. Based on these findings, a reexamination of (a) PA guidelines and (b) instructional practices is needed. Engagement in school sport within PE is common and popular due to the increased level of sporting cultures and popularity of elite and youth sporting opportunities. This study is not without limitations, as TPA and MVPA could be different under the diverse sports under each games classification. Future studies could be focused on different instructional models or approaches that could be viewed as pedagogically appropriate that may be used to elicit a higher degree of PA and maintain a relatively high level of educational richness.

References

- Bunker, D., & Thorpe, R. (1983). A model for the teaching of games in secondary schools. *Bulletin of Physical Education*, 18(1), 5–8.
- Fairclough, S., & Stratton, G. (2005). Physical activity levels in middle and high school physical education: A review. *Pediatric Exercise Science*, 17, 217–236.
- Gortmaker, S. L., Peterson, K., Wiecha, J., Sobol, A. M., Dixit, S., Fox, M. K., & Laird, N. (1999). Reducing obesity via a school-based interdisciplinary intervention among youth: Planet health. *Archives of Pediatrics and Adolescent Medicine*, 153(4), 409–418.
- Gréhaigne, J. F., Richard, J. F., & Griffin, L. L. (2005). *Teaching and learning team sports and games*. New York, NY: RoutledgeFalmer.

- Harrell, J. S., McMurray, R. G., Bangdiwala, S. I., Frauman, A. C., Gansky, S. A., & Bradley, C. B. (1996). The effects of a school-based intervention to reduce cardiovascular disease risk factors in elementary school children: The Cardiovascular Health in Children (CHIC) Study. *The Journal of Pediatrics*, 128(6), 797–805.
- Hastie, P., & Trost, S. G. (2002). Student physical activity levels during a sport education season. *Pediatric Exercise Science*, 14, 64–74.
- Hattie, J. A. C. (2009) *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. London, England: Routledge.
- Hopper, T. (2003). Four Rs for tactical awareness: Applying game performance assessment in net/wall games. *Journal of Teaching Elementary Physical Education*, 2003, 17–21.
- Kahn, E. B., Ramsey, L. T., Brownson, R. C., Heath, G. W., Howze, E. H., Powell, K. E., . . . Task Force on Community Preventive Services. (2002). The effectiveness of interventions to increase physical activity. *American Journal of Preventive Medicine*, 22(4S), 73–107.
- Kenny, D. A., & La Voie, L. (1985). Separating individual and group effects. *Journal of Personality and Social Psychology*, 48, 339–348.
- McKenzie, T. L., Sallis, J. F., Prochaska, J. J., Conway, T. L., Marshall, S. J., & Rosengard, P. (2004). Evaluation of a two-year middle-school physical education intervention: M-SPAN. *Medicine & Science in Sports & Exercise*, 36, 1382–1388.
- Memmert, D., & Harvey, S. (2010). Identification of non-specific tactical tasks in invasion games. *Physical Education and Sport Pedagogy*, 15(3), 287–305.
- Mitchell, S. A., Oslin, J. L., & Griffin, L. L. (2006). *Teaching sport concepts and skills: A tactical games approach* (2nd ed.). Champaign, IL: Human Kinetics.
- Neumark-Sztainer, D., Story, M., Hannan, P., & Rex, J. (2003). New moves: A school-based obesity prevention program for adolescent girls. *Preventive Medicine*, 37(1), 41–51.
- Oslin, J., & Mitchell, S. (2006). Game centred approaches to teaching physical education. In D. Kirk, D. Macdonald, & M. O'Sullivan (Eds.), *Handbook of physical education* (pp. 627–651). London, England: Sage.

- Pangrazi, R. P., Beighle, A., Vehige, T., & Vack, C. (2003). Impact of promoting lifestyle activity for youth (PLAY) on children's physical activity. *Journal of School Health, 73*, 317–321.
- Pate, R., Ward, D., Saunders, R., Felton, G., Dishman, R., & Dowda, M. (2005). Promotion of physical activity among high-school girls: A randomized controlled trial. *American Journal of Public Health, 95*(9), 1582–1587.
- Perlman, D. J. (2012). The influence of the sport education model on amotivated students' in-class physical activity. *European Physical Education Review, 18*(3), 335–345.
- Perlman, D. J. (2013). The influence of the social context on in-class physical activity. *Journal of Teaching in Physical Education, 32*, 45–60.
- Rink, J. E., & Hall, T. J. (2008). Research on effective teaching in elementary school physical education. *Elementary School Journal, 108*(3), 207–218.
- Trost, S. G., Loprinzi, P. D., Moore, R., & Pfeiffer, K. A. (2011). Comparison of accelerometer cut-points for predicting activity intensity in youth. *Medicine & Science in Sports & Exercise, 43*(7), 1360–1368.
- United Nations Educational, Scientific, and Cultural Organization. (2010). *Quality physical education*. Retrieved from <http://www.unesco.org/new/en/social-and-humansciences/themes/sport/physical-education-and-sport/quality-physical-education/>
- U.S. Department of Health and Human Services. (2010). *Strategies to improve the quality of physical education*. Washington, DC: Author.

PEDAGOGY

Identifying High School Physical Education Physical Activity Patterns After High School

*David Barney, Francis T. Pleban,
Carol Wilkinson, Keven A. Prusak*

Abstract

National standards for physical education (PE) encompass five principles for the purpose of defining what high school students should recognize and be able to perform as a result of a quality PE program. The expectation is that youth will develop an active, healthy lifestyle into adulthood from activities and skills taught in PE. Researchers from the United Kingdom and the United States have identified team sports as the primary curricular design in high school PE. However, it has been suggested the use of team sports is not an effective way to encourage students to be physically active throughout their lives. Participants for this study were 1,034 college-aged students from a private university located in the western United States. Responses from the questionnaire (Questions 9, 12, and 14) indicated a significant difference at the $p < 0.05$ level when gender was compared. Cohen's d for statistically significant values indicated low to moderate practical significance. Seven open-ended questions were used to investigate in which activities students enjoyed participating during high school PE. A majority of college

David Barney is associate professor, Teacher Education Department, Brigham Young University. Francis T. Pleban is associate professor, Department of Applied Health Science, Murray State University. Carol Wilkinson is associate professor, Teacher Education Department Brigham Young University. Keven A. Prusak is associate professor, Teacher Education Department, Brigham Young University Please send author correspondence to David Barney, Brigham Young University, 249 G Smith Field House, Provo, Utah 84602. E-mail: david_barney@byu.edu

students reflected the desire of being taught or exposed to lifetime activities during their high school PE class. College students who were surveyed tended to want to attain skills in high school that they could use throughout their lives. Study results indicate that some college students' reflections on past PE exposure were not beneficial.

The National Association for Sport and Physical Education (NASPE, 2004) in the document *Appropriate Practices for High School Physical Education* states the primary purpose of physical education (PE) is to help adolescents gain skills and knowledge to be physically active for a lifetime (p. 5). National standards for PE encompass five principles for the purpose of defining what a high school student should recognize and be able to perform as a result of a quality PE program (American Alliance for Health, Physical Education, Recreation, and Dance [AAPHERD], 2013). Of the five standards, the third standard is, "Demonstrates the knowledge and skill to achieve and maintain a health-enhancing level of physical activity and fitness." This standard suggests students should have the knowledge and skills to participate regularly in meaningful physical activity. Regular participation in physical activity is any bodily movement produced by skeletal muscles that results in energy expenditure (Bouchard & Shephard, 1994, p. 77). Furthermore, the U.S. Department of Health and Human Services (2008) has issued *Physical Activity Guidelines for Americans*. Current guidelines are that youth engage in 60 or more minutes of moderate- or vigorous-intensity aerobic activity at least 3 days a week. To elaborate, the expectation is that youth will develop an active, healthy lifestyle into adulthood from activities and skills they were taught in PE as youth.

Recent trends in high school PE indicate a prior attempt to help adolescents gain skills and knowledge to be physically active over a lifetime (Pangrazi, 2003). Researchers from the United Kingdom (Kimball, Jenkins, & Wallhead, 2009) and the United States (Mears, 2008a) have identified team sports as the primary curricular design in high school PE; however, it has been suggested that team sports is not an effective way to encourage students to be physically active throughout their lives (Fairclough, Stratton, & Baldwin, 2002; Mears, 2008a). In general, one identified drawback of a team sports curriculum is many students, particularly females, do not take pleasure in group participation and competition. Kimball et al. (2009)

investigated university students' perceptions of the influence of high school PE curriculum on their current level of physical activity. Differences were noted, based on gender, in reference to a team sports curriculum. Investigators indicated females did not find their high school PE experiences useful later in life. In contrast, male participants felt team sport skills and techniques aided them in their current physical activity lifestyles. If high school students are voicing displeasure with certain team sports curriculum practices, providing a more diverse curriculum may contribute to greater acceptance and increased physical activity patterns later in life (Trudeau, Laurencelle, & Shephard, 2004). Mears (2008a) also stated expanding curriculum diversity of high school PE may lead to students discovering physical activity that will facilitate motivation for continued participation beyond the school setting.

Dale and Corbin (2000) compared a traditional physical education (TPE) curriculum (i.e., team sport activities) to a conceptual physical education (CPE) curriculum (2 days in the classroom and 3 days in activity in the gymnasium) among ninth grade students. In the gymnasium, laboratory sessions were planned to include teaching fitness self-assessment, personal program-building skills, and methods of performing lifetime physical activities designed to meet national health goals. A 3-year follow-up was conducted of male and female students enrolled in the CPE curricula. Data indicated that male CPE students were significantly more active than males in the TPE curriculum; however, females, regardless of curricula, were no more active after 3 years.

Scantling, Strand, Lackey, and McAleese (1995) studied why high school students avoid taking PE classes. First, students identified courses other than PE as being more important in preparing them for college. Second, students responded that their lack of PE participation was due to the PE course structure. The researchers, through further inquiry, found several specific factors for students' dislike of PE, including repetition of similar physical activities from semester to semester, male-dominated physical activities, and the extreme competitive nature of the curriculum.

Social learning theory was used as the basis for this study, which Mears (2008b) stated that the consequences of a behavior influence the likelihood of continued performance. For example, exposing students to certain curricular activities (team sports, fitness, etc.) affects the activities they will participate in later and throughout their lives. Another element to social learning theory is that because hu-

mans learn by observing and participating in activity, they are likely to continue behaviors observed in others of similar age and ability. Thus, the more high school students are exposed to lifetime activities in their high school PE class, the greater the likelihood they will participate in those activities throughout their lives. Exposure and practice in performing skills and activities, as well as participation in classes themselves, could facilitate continuing activity into adulthood (Crosbie-Burnett & Lewis, 1993; Jones, 1989; Perry, Baranowski, & Parcel, 1990; Thomas, 1990; Woodward, 1982). It is implied in this study that the activities in which high school students participate will affect activities in which they will participate after graduating high school. The purpose of this study was to investigate college students' high school PE experience and gender effects on their physical activity after high school, through an initial quantitative instrument design, with open-ended follow-up questions, and dissemination.

Methods

Participants

Participants for this study were 1,034 college-aged students (539 males, 481 females) from a private university located in the western United States majoring in a variety of courses of study and enrolled in 36 university physical activity classes. None of the participants were PE majors. Activity classes identified and used were badminton, basketball, bowling, racquetball, swimming, tennis, volleyball, and weight training. Of those students that were asked to participate in the study, 99% agreed to participate.

Instrumentation

For the initial study, the investigator developed a 19-statement survey (Table 1) from previous research in which activity patterns of college-aged students after their high school PE classes was investigated. In this study, survey development included adding eight open-ended response questions addressing participants' high school PE experience to the seven scaling response questions. These new questions addressed physical activity in which students are involved as college students and were previously constructed by Mears (2007) and Everhart et al. (2005). Students were asked to rate certain aspects of their physical activity on a scale from 1 = *not meaningful* to 10 = *very meaningful*. The remaining four statements addressed par-

ticipant demographics. To establish content validity, the investigator asked a panel of experts to read each survey question for clarity and understanding.

Table 1
*Effect of High School Physical Education
on Physical Activity Survey*

1.	What is your academic year?	Fr.	Soph.	Jr.	Sr.	Grad Student
2.	Sex:	M	F			
3.	How many years since you have graduated from high school?					
		1	2	3	4	5 6 7 8 More than 8 years
4.	What types of activities were taught in your high school physical education classes? Check all that apply.					
	_____ Team Sports (basketball, softball, volleyball, soccer, etc.)					
	_____ Lifetime Sports (golf, tennis, bowling, rollerblading, pickle ball, etc.)					
	_____ Outdoor Activities (disc golf, wall climbing, biking, skiing, orienteering, etc.)					
	_____ Fitness Activities (lifting weights, aerobics, treadmill, elliptical, stationary bikes, yoga, walking, etc.)					
5.	Of the activities you participated in during high school physical education, which ones did you enjoy participating in? Please explain your answer.					
6.	What activities do you feel were a waste of your high school physical education class time? Please explain your answer.					

Table 1 (cont.)

7. Do you engage in physical activity more now than when you were in high school? Yes No
Please explain your answer.
8. As you think back to your high school physical education experience, what activities and experiences do you wish you had been taught or exposed to? Please explain your answer.
9. On a scale of 1 to 10 (1= *not meaningful*, 10 = *very meaningful*) how meaningful was your high school physical education experience?
Please explain your answer.
- 1 2 3 4 5 6 7 8 9 10
10. Is being physically active important to you? Please explain your answer.
11. How many days in the week do you participate in physical activity?
- 1 2 3 4 5 6 7
12. How often do you participate in strength training exercises during the week? (Hours per week)
- 0 1 2 3 4 5 6 7 8 9 +10
13. How often do you participate in exercise designed for cardiovascular endurance? (Hours per week)
- 0 1 2 3 4 5 6 7 8 9 +10
14. How often do you participate in team sports during the week? (Hours per week)
- 0 1 2 3 4 5 6 7 8 9 +10

Table 1 (cont.)

15. How many days per week do you engage in abdominal exercises?
(Hours per week)

0 1 2 3 4 5 6 7 8 9 +10

16. How many days a week did you have physical education class in high school?

0 1 2 3 4 5

17. Do you feel your high school physical education classes gave you the knowledge and skills to be successful and comfortable being physically active throughout your life? Please explain your answer.

18. After completing your high school physical education experiences, could you walk into a gym or participate in a certain activity and know how to participate successfully on your own? Please explain your answer.

19. What state did you live in while attending high school?

Procedures

Convenience sampling was employed to collect response data for this study. Additionally, investigators secured university institutional review board (IRB) approval to conduct the study. After IRB approval, investigators contacted 15 physical activity class instructors and explained the study and instrumentation. After instructors agreed to have their classes queried for student participation, investigators attended each physical activity class and systematically administered and collected the survey. Before survey administration, investigators explained the survey, asking for volunteers to participate before volunteers signed informed consent forms. Students were assured their voluntary decision to participate or not participate in the study would not affect their grade in class or class standing. Completion of survey explanation, administration, and document return took approximately 10 min.

Data Analysis

Analyses were performed on student responses to the survey instrument. Quantitative data analysis consisted of chi-squares (χ^2) as well as measures of central tendency and dispersion. Chi-square was conducted to compare question responses between genders. Significance was established at the $p < 0.05$ level. Means, standard deviations, chi-square, levels of significance, and Cohen's d were reported for significant effects. Responses to questions, defined by gender, were presented as percentages. Open-ended questions were analyzed based on the thematic content of respondent's short answers. To determine parallel thematic content (Mueller & Skamp, 2003), two of the researchers reviewed the responses and identified common themes.

Results

One thousand thirty-four college-aged students participated in this study ($M = 1.47$, $SD = .499$), 546 males and 488 females, respectively. Participants were enrolled as college freshmen ($n = 216$, 20.9%), sophomores ($n = 208$, 20.1%), juniors ($n = 260$, 25.1%), seniors ($n = 302$, 29.2%), or graduate students ($n = 48$, 4.6%) at the time of the study. Males and females were similar in regard to academic school standing and ethnicity. Tables 2, 3, and 4 depict participant characteristics by academic standing, activity type, and years since high school, respectively.

Table 2
Participant Characteristics by Academic Standing

Group	M (SD)	Freshman		Sophomore		Junior		Senior		Graduate	
		n	%	n	%	n	%	n	%	n	%
Males	2.78 (1.22)	118	21.9%	99	18.4%	132	24.5%	170	31.5%	20	3.7%
Females	2.75 (1.20)	98	20.4%	107	22.2%	125	26%	131	27.2%	20	4.2%

Table 3
Frequencies: Question 4 Gender and Activity Type

Group	Team sports		Lifetime sports		Outdoor activities		Fitness activities	
	n	%	n	%	n	%	n	%
Males	517	94.0%	303	55.5%	112	22.3%	449	82.2%
Females	29	5.3%	243	44.5%	423	77.5%	97	17.8%

Table 4
Participant Characteristics by Years Since High School

Group	M (SD)	Y1		Y2		Y3		Y4		Y5		Y6		Y7		Y8		Y+8	
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Males	4.42 (2.28)	108	19.8%	22	4%	39	7.1%	94	17.2%	89	16.3%	100	18.3%	49	9%	23	4.2%	22	4%
Females	3.04 (1.89)	107	21.9%	124	25.4%	104	21.3%	60	12.3%	42	8.6%	21	4.3%	12	2.5%	5	1.0%	13	2.7%

Quantitative Analysis

Significant differences were found for three of the eight scaling questions when gender was compared. Chi-square did not show an association between gender and activity type (i.e., team sports, lifetime sports, outdoor activities, and fitness activities).

Responses to Question 9, “On a scale of 1 to 10 (1 = *not meaningful* 10 = *very meaningful*), how meaningful was your high school physical education experience?” indicated an association by gender (males: $M = 6.67$, $SD = 2.29$; females: $M = 5.93$, $SD = 2.56$), $\chi^2 (10, N = 1,034) = 33.03$, $p > .001$. Cohen’s d for Question 9 was 0.30, representing a small to moderate effect.

Responses to Question 12, “How often do you participate in strength training exercises during the week?” indicated a moderate effect by gender. Chi-square was different by gender (males: $M = 2.57$, $SD = 2.33$; females: $M = 2.11$, $SD = 1.99$) and hours per week strength training. For Question 14, “How often do you participate in team sports during the week?” a moderate effect was found by gender (males: $M = 2.73$, $SD = 2.25$; females: $M = 1.78$, $SD = 2.07$), $\chi^2 (10, N = 1,034) = 20.41$, $p > .05$, and hours per week participating in team sports, $\chi^2 (10, N = 1,034) = 77.73$, $p > .001$. Cohen’s d for Questions 12 and 14 was 0.21 and 0.43, respectively. The range of effect size for these analyses was found to be associated with Cohen’s (1988) convention for a small effect ($d = .20$) to moderate effect ($d = .50$), suggesting low to high practical significance.

Follow-Up Questions

Additional data results were from short-answer responses from respondents. Seven questions (Questions 5, 6, 7, 8, 9, 17, and 18) were used in the thematic analysis and findings reported below.

When students were asked in an open-ended question in which activities they enjoyed participating (Question 5), a number of students responded favorably to team sports, enjoying the social aspect. Referencing the social aspect, students stated they “like being around people,” “helps build friendships and are more fun,” “fun to interact with my friends,” and “I bonded with people.”

Responses to Question 6 (a lifetime activity) indicated the primary activity students found to be least beneficial of their PE experience was running, in particular, running the mile. Both male and female students commented, “I dreaded having to run the mile,” “I hated it,” and “Running the mile didn’t do a thing for me.” Also referencing Question 6, many female students indicated dodgeball

was an unwarranted use of their PE time. Conversely, male students stated that they enjoyed playing dodgeball, a sport generally noted for its male-dominated group participation and competition, paralleling Kimball et al.'s (2009) findings specific to gender differences.

In a third question (Question 7), students were asked if they engaged in physical activity more now than when they were in high school. A spectrum of responses were obtained. Some students stated that because they are "not on [an athletic] team, they are not as active." However, other students made statements such as "I ride my bike everywhere," "I'm married and want to stay healthy," and "I am more motivated to live a healthy lifestyle."

In Question 8, respondents were asked to reflect back to their high school PE experience—to activities they wished they had been taught or exposed to. The overwhelming statements addressed lifetime activities. Students specifically mentioned yoga, golf, tennis, swimming, and bowling. One student stated that he wished he had been exposed to "more lifetime sports to make the transition easier."

In Question 9, students were asked about the meaningfulness of their high school PE experience. Once again, similar to Question 7 responses, polarizing statements were obtained. For example, "Good break from school," "Loved it, best thing about high school," and "It released stress and created a lot of fun in high school." Though, other statements included "Degrading to self and self-worth, did not give me the desire to be active," "Teacher didn't care what we did," and "A lot of it was goof off time."

Current physical activity patterns, from past physical activity instruction, were addressed in Questions 17 and 18. Students revealed in response to Question 17 that generally they did not feel they received the knowledge and skills to be successful in physical activity throughout their lives in their high school PE classes. Finally, students were asked (Question 18), based on what they were taught in high school PE, if they walked into a commercial gym or participated in a certain activity, would they be successful on their own, with no instruction. Many of the students felt they could be successful because they were involved in team sports while in high school. This, in part, contradicts the open-ended responses teased out in Question 17, "Do you feel your high school PE classes gave you the knowledge and skills to be successful and comfortable being physically active throughout your life? Please explain your answer." Yet, one of the major themes students communicated as a reason they could not be successful in a gym or activity was their frequency of participating in team sports.

Discussion

A number of participants from this study expressed the same thoughts Pangrazi (2003) concluded, stating many high school students found their PE experience irrelevant. College students who were surveyed tended to want to attain skills in high school that they could use throughout their lives, such as golf, tennis, walking, and outdoor activities. This identified a needed focus on the curriculum taught to students, which is within the PE teacher's control.

In regard to students' attitudes about their high school PE experience, the activities in which college students participated and to which they wish they had been exposed while in high school PE were addressed in additional data. College students responded overwhelmingly to team sports when asked in which activities they enjoyed participating during high school PE, more specifically, basketball, flag football, volleyball, and soccer. College students were also asked which activities and experiences they wish they had been taught or exposed to in their high school PE class. A large majority of the college students wish they had been taught or exposed to lifetime activities. College students specifically mentioned golf, tennis, weight training, bowling, and ultimate Frisbee. The interesting point regarding these two survey questions is that when students were in high school, many enjoyed and wanted team sport participation, which many of their PE teachers instituted in their courses. Yet, in hindsight, these college students indicated a desire of having been taught and exposed to activities that would have been beneficial to them later in life. Results paralleled Kimball et al. (2009), in that team sports were a common curricular offering to students in high school PE, but not sufficient for students to develop the skills and knowledge to participate in lifetime activities.

When respondents were asked if they were given the knowledge and skills to be successful and satisfied being physically active throughout their lives, many of them said they did not feel satisfied. For example, students stated, "They didn't teach us much that is useful now," "We just played sports we already knew," and "My class never taught me how to stay active, it was more of come and play a sport." Many of student responses were similar to findings from Scantling et al. (1995), who investigated why high school students did not take PE in high school. They found that many high school students performed the same activities (i.e., sports) repeatedly and the PE curriculum was focused primarily on team sport competition.

Barney and Strand (2008) suggested a deeper level of instruction needs to be provided to high school students in PE class in lifestyle skill development. They continued by stating there is a danger in high school PE of communicating the message that such education is only relevant for students who are competent or skilled movers interested in pursuing physical activity through sport competition. Findings from this study and the present study indicate that students in high school PE need to be put in a position to master skills, be given opportunities to perform, and have a curriculum with opportunities to be exposed to lifetime activities, thus better preparing them to adapt physical activity into their future lifestyles.

Conclusions

The purpose of this study was to investigate college students' high school PE experience and gender effects on their physical activity after high school. The investigators anticipate the findings from this study will help expand and strengthen the literature for the betterment of high school PE instruction.

Significant difference were revealed in this study among males and females referencing the meaningfulness of their high school PE experience, participating in strength training exercises, and participating in team sport activities; additionally, females found less meaning in and participated less in high school PE than males did.

NASPE (2004) Standard 3 states the goal for students is to "[participate] regularly in physical activity." High school physical educators are in a position to influence students to participate in regular and practical physical activity throughout their lives by exposing them to activities in which they can participate throughout their lives. College students' reflection on their past PE exposure present patterns are shown in the study results.

A final conclusion from this investigation is the importance of physical education teacher education (PETE) faculty preparing PETE majors to teach relevant high school PE properly and effectively. Many PETE majors enter PETE programs with preconceived beliefs of how high school PE should be taught (Placek et al., 1995), and in many cases, their beliefs of teaching high school PE are grossly misaligned. For this purpose, PETE faculty are charged to educate, train, and demonstrate which lifetime activities are appropriate to be taught in high school PE for the purpose of supporting high school students for a lifetime of regular physical activity.

Implications of this Study

The results from this study are beneficial for high school physical educators and PETE faculty in their teaching and preparations. Results showed college students preferred, and were satisfied with, activities (i.e., team sports) in which they participated during their high school years. Yet, as these students aged, they expressed a desire to have been exposed to a variety of lifetime activities. Consequently, high school physical educators should expose their high school students to a variety of lifetime activities. In addition, as these high school students are participating in lifetime activities, physical educators need to communicate to students the importance of these activities throughout their lives. Notably, some high school students may not find initial enjoyment in these activities (lifetime activities), yet later in life, it is expected they will be more appreciative of their previous exposure to lifetime activities.

The second group that can benefit from the results of this study is PETE faculty. PETE faculty will expose their pre-service students to lifetime activities that can be taught to high school students. By exposing pre-service teachers to a multitude of lifetime activities, PETE faculty are communicating to these students that there is more to high school PE than flag football, basketball, softball, volleyball, and other team sports. With the results from this study, PETE faculty who expose and provide appropriate time in lifetime activities will thus more effectively prepare pre-service teachers.

Study Limitations

The investigators of this study noted a number of limitations of this study. Foremost was the use of a sample of convenience. Only college students in physical activity classes were surveyed, possibly influencing physical activity pattern responses. Because a cross-sectional design was used, participants were relied on to recall past and present perceptions related to physical activity practices in school accurately and truthfully. In addition, students' responses may have been different from classmates' responses who did not volunteer for the study. Respondents also were from one university, and students who participated in this study may not have been representative of other students at their university, as well as other universities or in other geographic regions, thus limiting the generalizability of the findings.

References

- American Alliance for Health, Physical Education, Recreation, and Dance. (2013). *National standards for physical education*. Reston, VA: Author.
- Barney, D., & Strand, B. (2008). Do high school students know what practices are appropriate in physical education. *The High School Journal*, 92(1), 33–39.
- Bourchard, C., & Shephard, R. J. (1994). Physical activity, fitness, and health: The model and key concepts. In C. Boushvard & R. J. Shephard (Eds.), *Physical activity, fitness, and health: International proceedings and consensus statement* (Vol. 1, pp. 77–88). Champaign, IL: Human Kinetics.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Crosbie-Burnett, M., & Lewis, E. A. (1993). Theoretical contributions from social and cognitive behavioral psychology. In P. G. Boss, W. J. Doherty, R. LaRossa, W. R. Schumm, & S. K. Streinmetz (Eds.), *Sourcebook for family theories and methods: A contextual approach* (pp. 531–557). New York, NY: Plenum.
- Dale, D., & Corbin, C. B. (2000). Physical activity participation of high school graduates following exposure to conceptual or traditional physical education. *Research Quarterly for Exercise Science*, 71(1), 61–68.
- Everhart, B., Kernodle, M., Ballard, K., McKey, C., Eason, B., & Weeks, M. (2005). Physical activity patterns of college students with and without high school physical education. *Perceptual and Motor Skills*, 100, 1114–1120.
- Fairclough, S., Stratton, G., & Baldwin, G. (2002). The contribution of secondary school physical education to lifetime physical activity. *European Physical Education Review*, 8, 69–84.
- Jones, J. W. (1989). Personality and epistemology: Cognitive social learning theory as a philosophy of science. *Zygon*, 24, 23–28.
- Kimball, J., Jenkins, J., & Wallhead, T. (2009). Influence of high school physical education on university students' physical activity. *European Physical Education Review*, 15, 249–267.
- Mears, D. (2007). High school physical education and physical activity in young women. *Perceptual and Motor Skills*, 104, 844–854.

- Mears, D. (2008a). Curriculum diversity and young adult physical activity: Reflections from high school physical education. *The Physical Educator*, 65, 197–205.
- Mears, D. (2008b). The effects of physical education requirements on physical activity of young adults. *American Secondary Education*, 36, 70–83.
- Mueller, A., & Skamp, K. (2003). Teacher candidates talk: Listen to the steady beat of learning to teach. *Journal of Teacher Education*, 54(5), 428–440.
- National Association for Sport and Physical Education. (2004). *Appropriate practices for high school physical education*. Reston, VA: Author.
- Pangrazi, R. P. (2003). Physical education K–12: “All for one and one for all.” *Quest*, 55, 105–117.
- Perry, C. L., Baranowski, T., & Parcel, G. S. (1990). How individuals, environments and health behavior interact: Social learning theory. In K. Glanz, F. M. Lewis, & B. K. Rimer (Eds.), *Health behavior and health education* (pp. 153–178). San Francisco, CA: Jossey-Bass.
- Placek, J. H., Dodds, P., Doolittle, S. A., Portman, P. A., Ratliffe, T. A., & Pinkham, K. M. (1995). Teaching recruits’ physical education backgrounds and beliefs about purpose of their subject matter. *Journal of Teaching in Physical Education*, 14, 246–261.
- Scantling, E., Strand, B., Lackey, D., & McAleese, W. (1995). An analysis of physical education avoidance. *The Physical Educator*, 52, 197–202.
- Thomas, R. M. (1990). Social learning theory. In R. M. Thomas (Ed.), *Encyclopedia of human development and education: Theory, research, and studies* (pp. 75–78). New York, NY: Pergamon.
- Trudeau, F., Laurencelle, L., & Shephard, R. J. (2004). Tracking of physical activity from childhood to adulthood. *Medicine & Science in Sports & Exercise*, 36, 1937–1943.
- U.S. Department of Health and Human Service. (2008). *Physical activity guidelines for Americans*. Washington, DC: Author.
- Woodward, W. R. (1982). The discovery of social behaviorism and social learning theory, 1870–1980. *American Psychologist*, 37, 396–410.

PEDAGOGY

Impact of Physical Educators on Local School Wellness Policies

Matthew T. Buns and Katherine T. Thomas

Abstract

The Child Nutrition and WIC Reauthorization Act of 2004 required school district officials to approve a local school wellness policy by July 2006, making this the first federal legislation requiring school district officials to establish a goal for physical activity and that could focus on physical education. The purpose of this study was to evaluate a sample of local school wellness policies with particular attention to (1) the presence of seven federally mandated components as goals within the policy, (2) characterization of differences among policies created with and without formal input from physical educators, and (3) reference to assessment through having a monitor and a plan to measure implementation. Administrators in every district in Iowa were contacted by mail to complete a brief survey and submit a copy of their local school wellness policy; 241(43%) responded fully. Physical education (75%) and health teachers (64%) were not required committee members, but served on the majority of committees. Policies were examined in two ways. First, policies were examined to determine whether the seven federally mandated components were present. Second, a numeric value was assigned to the characteristics of each goal, nutrition guideline, and assessment plan that was summed ($M = 54.5$, $SD = 28.4$) from a possible score of 113. Policies were predictably influenced by committee membership. Having a physical education teacher on the committee had a modest influence on the content of the physi-

Matthew T. Buns is an assistant professor, Department of Human Performance, Minnesota State University, Mankato. Katherine T. Thomas is an associate professor, Department of Kinesiology, Health Promotion, and Recreation, University of North Texas. Please send author correspondence to Matthew T. Buns, Minnesota State University, Mankato, 175 Highland North, Mankato, MN 56001. Email: matthew.buns@mnsu.edu

cal education goal (3.1 vs. 2.4 goal points, $ES = 0.4$) and specific aspects of the physical education goal (more minutes of physical education per week [$ES = 0.4$], all grades K–12 [$ES = 0.32$]). Physical educators had a positive influence on school wellness policies.

Schools are a primary target of health promotion because most children attend school and spend a significant amount of time in school, thus positioning schools as a primary location to reach most children and their families (Koplan, 2005). Physical education (PE) is a key strategy to promote student health and reduce childhood obesity by increasing physical activity (PA). Thus, schools are critical in promoting student health and preventing childhood obesity (U.S. Department of Agriculture [USDA], 2006; Wechsler, McKenna, Lee, & Dietz, 2004). Children are influenced by teachers and school-based activities. Therefore, a school in which healthy eating and PA are encouraged is a logical place to address childhood obesity. However, until July 1, 2006, schools were not required by federal legislation to address key components of the health of the school environment, specifically PA and nutrition. The Child Nutrition and WIC Reauthorization Act of 2004 (USDA, 2004) required schools to adopt local school wellness policies by July 1, 2006, or the first day of the 2006 school year, whichever occurred first. The legislation was the first to systematically address nutrition and PA in most schools. The law applied to all districts participating in the Richard B. Russell National School Lunch Act (USDA, 2004), widely known as child nutrition programs (e.g., school breakfast, lunch, and/or snacks). The law included eight specific requirements.

The first requirement was to gather input from sources including parents, students, the public, representatives of the school food authority, school administrators, and school board members. District officials were encouraged to form a committee to gather input, but had the option of meeting this requirement in other ways. The law required goals in three areas to be established within districts: nutrition education, PA, and other school-based wellness activities. Two aspects of the law were directed at foods in schools. School officials were to provide assurances that school meal programs meet current regulations by stating that the school meal program is not more restrictive than federal regulations. Thus, eligible students were to be provided access to free and reduced-price lunch in a confidential way. School district officials were also required to develop nutrition guidelines for all foods available on campus. The focus of the nutrition guidelines were foods outside the school meals program in-

cluding vending, à la carte, celebrations (e.g., school parties), fundraisers, and school stores. Finally, the law required school district officials to have a plan to measure implementation and to designate a monitor of implementation.

During 2005, sample wellness policies were created by organizations and agencies to guide school districts at the national (e.g., National Alliance for Nutrition and Activity [NANA], 2005; School Nutrition Association, 2005) and state level (school board associations, state Action for Healthy Kids (2006) teams. National sample policies included PE goals designed to meet the PA goal requirement (Action for Healthy Kids, 2006; NANA, 2005). Other PA goal choices were recess, after-school programs, safe routes to school, the use of PA as a punishment, and integrating PA into the classroom. The requirement was for the district officials to select one or more areas of need for each goal so sample policies included multiple options. Each option, for example PE, was further defined by criteria that once again could be selected based on local needs. Some of those options for PE included certified teacher, daily, 150 and 225 min per week, Grades K–12, required for graduation, and student-to-teacher ratios similar to other academic classes.

Although PA is one of the goals, input from a PA expert was not required during development of the policy. For example, the law did not require consultation with PE teachers. The law is associated with the federally funded child nutrition programs and has a requirement directed at the food service program (assurances that school meals are not more restrictive than federal guidelines), and the district officials were required to gather input from the district food service authority (typically the food service director). Two other requirements, nutrition education goal and guidelines for all foods available on campus, support the child nutrition program goals, but are not necessarily directed at the food service programs. Gathering appropriate input from physical educators would have been logical because PA is half of the energy balance equation and a significant factor in childhood obesity (Dietz, 2004). Furthermore, PA goals may influence the physical education program directly or indirectly. An indirect influence may be restricting PA as punishment or using facilities for after-school programs.

The purpose of the legislation requiring local school wellness policies was to improve children's health and reduce childhood obesity. Obesity is a significant public health problem, and schools need to be part of the solution (American Academy of Pediatrics,

2006; Pate et al., 2006; Wechsler et al., 2004). Excess weight brings significant health consequences. The general population, including children, is gaining weight at an alarming rate and to a dangerous degree (Institute of Medicine of the National Academies, 2004). The percentage of overweight children aged 2 to 5 years and 12 to 19 years has more than doubled over the past 3 decades, and among children aged 6 to 11 years, this number has more than tripled (Koplan, Liverman, & Kraak, 2005). Overweight children are at greater risk to develop a number of health problems including type 2 diabetes, high blood pressure, high blood lipids, asthma, sleep apnea, chronic hypoxemia, early maturation, and orthopedic problems (U.S. Department of Health and Human Services, 2001). Of particular concern is that many of these diseases were previously thought to be adult diseases. Overweight children also experience psychological burdens associated with the stigma of being overweight, including low self-esteem, poor body image, and symptoms of depression (University of California, Berkley/Cooperative Extension, 2000). Unfortunately, a poor self-image, which often accompanies overweight youth, tends to follow them into adulthood, which is related to negative outcomes including higher rates of poverty and fewer years of education (Dietz, 1998). Obesity is a complex problem that must be addressed at many levels as suggested by the socio-ecological model (Centers for Disease Control and Prevention [CDC], 2007). Policy directed at improving nutrition and PA, such as the Section 204 requiring school wellness policies, has been identified as a key strategy in the socio-ecological model (CDC, 2007).

Implementing effective local wellness policy is a difficult task in many districts. It was reported in a statewide survey of School Health Advisory Board coordinators in Virginia that over half (59%, $n = 54$) of district officials expressed an interest in receiving help from university experts regarding the development of local wellness policy (Serrano et al., 2007). Lack of funding was cited as one of the main challenges in implementing a local wellness policy by 37% of those participants.

The content of district wellness policies in Utah was analyzed prior to the July 1, 2006, federal deadline (Metos & Nanney, 2007). Of participating districts, 77% met all five of what researchers considered to be the federal requirements (nutrition education and PA, guidelines for all food available at school, and monitoring and community/parent participation). Federal guidelines do not require any specific wording for policy goals, so any reference to the main goal

was considered as compliant. Metos and Nanney (2007) described the strength of the language used by these district officials as “disappointing.” It is unknown how the district policies in Utah met the other criteria (e.g., assurances, other school-based wellness) not assessed in the Metos and Nanney study.

The purpose of this study was to evaluate a sample of local school wellness policies with particular attention to (1) the presence of seven federally mandated components as goals within the policy, (2) the characterization of differences among policies created with and without formal input from physical educators, and (3) reference to assessment through having a monitor and a plan to measure implementation.

Iowa is a “local control” state with over 350 independent public school districts. Thus, state officials provide few mandates or regulations for schools. Federal regulations are required to be met in child nutrition programs, but no state nutrition standards have been adopted. Similarly, there are no state PE standards and few regulations (National Association for Sport and Physical Education & American Heart Association, 2006). Therefore, the potential for variability in wellness policies in Iowa is greater than in most states where more guidance is provided to districts. The variety of policies in this state is more likely to represent the variety of policies nationwide because regulations vary widely among states. Elected school boards have greater influence on school policy in Iowa because local control means less influence of agencies (e.g., Department of Education, Department of Public Health, and the legislature). School board members serve at the will of the public and are viewed as a reflection of public opinion. Thus, examining policies in Iowa has the potential to reveal what parents and other stakeholders value related to school wellness.

Method

Participants

Superintendents from all public ($n = 370$) and private schools ($n = 190$) in Iowa were contacted by direct mail and asked to participate in the study. Two hundred ninety-nine (53%) school district superintendents agreed to participate and returned materials in postage paid envelopes. After two mailings and a follow-up phone call, 241 superintendents (public schools, $n = 152$; private schools, $n = 29$; unidentified, $n = 60$) returned the required information for an

overall usable response rate of 43%. This response rate is aligned with other similar studies noted in social science research literature (Abes, Jackson, & Jones, 2002; Sax, Austin, Korn, & Gilmartin, 1999). The project was approved by the institutional review board, human subjects review committee. Participants provided passive consent by returning the survey and/or policy.

Instruments

Survey. A seven-question survey was focused on the process used to develop the local school wellness policy. Open- and close-ended questions included committee membership, whether a needs assessment was conducted, and information about the committee meetings (e.g., when they first met, number of meetings, progress reports, whether the committee will continue to meet). This information could not be determined by examining the local wellness policy.

Global analysis. These seven criteria should be present in the policy: (1) nutrition education, (2) PA, (3) other school-based wellness, (4) nutrition guidelines for all foods available on campus, (5) assurances that the school meal program was not more restrictive than federal guidelines, (6) a monitor, and (7) a plan to measure implementation. Therefore, a global score representing whether each of the seven areas was addressed was calculated. This score was not based on a value judgment; instead, the global score represented a valid indicator as to whether each of the seven required areas was identified in the policy. The global score represented the district superintendent's intent to meet the requirements of the law similar to the process used by Metos and Nanney (2007). One point was assigned for each of the seven components of the policy regardless of how much or little detail was included. For example, each of the statements below would be scored as 1 for the global analysis:

- Our district will measure implementation of the local wellness policy.
- Each year the building principal will measure implementation of the policy and report to the superintendent; the report is due 2 weeks after the last day of student attendance. The food service director will report to the superintendent on compliance with nutrition policies within food service areas. The superintendent will examine the reports of building principals and the food service director, then report to the school board on the implementation of the local school well-

ness policy. This report is due to the board one month after the last day of student attendance.

Content analysis of the policy. Members of the Iowa Association of School Boards (IASB) in conjunction with members of Iowa Partners: Action for Health Kids developed a model school wellness policy and made this sample available to school districts through the association website (IASB, 2007). The IASB sample policy, based on the NANA (2005) sample school wellness policy, was used as a template for the content analysis of the policies. The template had 113 unique characteristics for the three goals, nutrition guidelines, and a plan to measure and monitor. Most goals in the sample policy had more than one subgoal. For example, the other school-based wellness activities subgoals included staff wellness and communication with parents, and for PA, subgoals included PE, recess, and after-school programs. Subgoals typically had multiple descriptors. Each subgoal component was given a numeric value based on the level of qualifiers. A sample for a portion of the coding scheme is presented in Table 1. The point scheme used for the content analysis aligns with Metos and Nanney's (2007) recommended point scheme system as a valid way to compare and contrast policies. The values could be summed for subgoal and goal scores and a total policy score. This allowed policies to include one or more subgoals. Higher scores would represent more subgoals and/or more detail. The legislation encouraged district officials to create policies to meet local needs; therefore, the template was designed so additional subgoals and descriptors could be added during the content analysis. An additional 101 subgoals and descriptors were added to the original template, and policies examined prior to each addition were rescored but also compared to the original IASB template.

Reliability. One rater evaluated all of the policies. This rater then randomly reevaluated 5% of the policies with agreement between the two ratings at 94% (intrarater reliability). Two additional trained raters evaluated a randomly selected sample of the policies ($n = 6$). These scores were compared and produced agreement of 91% (interrater reliability). A comparison of the ratings among these three raters produced a kappa value of $> .90$ for inter- and intrarater scoring.

Table 1
Sample Coding Scheme for Content Analysis of the Local Wellness Policy

Policy goal	Subgoal	Points		
		1.0	0.5	0.25
Physical Activity	Physical Education	Will require daily	May be daily	Research a process to move toward daily PE
	Recess	20 minutes per day recess minimum	Strive for 20 minutes of daily recess	
	Punishment	Exercise will not be used as punishment Physical activity will not be withheld as punishment	Encourage teachers to not withhold recess and PE as a punishment Encourage teachers to not withhold recess and PE as a punishment	

Effect sizes. Effect sizes were calculated (Hedges & Olkin, 1985, p. 76) to guide the interpretation of meaningful findings and to compare data from districts with a physical educator serving on the school wellness policy committee with those districts where a physical educator was not formally on the committee. For this type of data, an effect size of 0.3 is considered a small effect, around 0.5 is a medium effect, and 0.8 or greater is a large effect (Cohen, 1992).

Results

Overall Data

Results were organized around three data collection strategies: (1) a survey, (2) a global analysis, and (3) the content analysis of the local school wellness policy. Policy statements consisted of brief and varied action statements of what school district officials were doing or planning to do (e.g., “Our district will not allow teachers

to use physical activity as punishment or withhold physical activity as punishment”).

Committee Membership

The law required input from specific stakeholders, and it was recommended in the sample policy that a committee be formed in each district to meet this requirement. Survey information was used to determine compliance with this aspect of the law because this information was not required to be included in the policies. A committee was formed in 97% of the districts ($n = 233$), but all stakeholders, as defined by the requirements of the law, were involved in less than half of the school districts (39%; Table 2). The typical committee had 15 ($SD = 7.5$) members. Those were the food service director, two administrators, a school board member, one to two students, a representative of the public, and one to two classroom teachers. On average, the committees met 4.3 times ($SD = 3.1$).

Table 2
*Local School Wellness Policy Committee Composition:
Stakeholders Providing Input During Development
of the Local School Wellness Policy*

Variable	Required?	Percent of committees having at least one person for the category	M	SD
Food service director	Yes	96.7%	1.05	0.34
School administrators	Yes	96.3%	1.99	1.08
Parent	Yes	90.5%	2.38	2.64
School board members	Yes	72.6%	.99	0.85
Student	Yes	66.4%	1.55	1.54
Member of public	Yes	60.2%	1.24	1.39
Physical education teacher	No	75.9%	.76	0.43
Classroom teacher	No	74.3%	1.49	1.39
School nurse	No	72.2%	.89	0.70
Health teacher	No	64.7%	.86	0.79
Other food service	No	30.7%	0.42	0.73
Other(s)	No	29.9%	1.40	1.24

Global Score and Content Analysis

Approximately 58% of the 241 superintendents addressed the seven requirements in the law: (1) nutrition education goal, (2) PA goal, (3) other school-based wellness goal, (4) nutrition guidelines for all foods available on campus, (5) assurances that the school meal program was not more restrictive than federal guidelines, (6) a monitor, and (7) a plan to measure implementation. Of the remaining 42%, most (38%) identified between three and six of the requirements based on the global analysis. Assurances that access to school meals were not more restrictive than federal regulations accounted for nearly 1 in 3 of the missing requirements (Table 3). When two global goals were missing from the districts (e.g., the global score was 5 or less), typically assurances and monitoring were missing.

Table 3
Percent of Policies Meeting the Seven Requirements of the Local School Wellness Policy Based on Global Analysis

Requirement	% policies met
Nutrition guidelines goal	94%
Nutrition education goal	93%
Physical activity goal	92%
Plan for implementation	88%
Other school wellness goal	81%
Monitor goal	81%
Assurances statement	71%
Met six of seven	15%
Provided assurances but missed something else	12%
Met six of seven but not assurances	8%

Content analysis point values were summed within policy and averaged for nutrition education ($M = 4.41$, $SD = 2.94$, max = 7), PA ($M = 6.59$, $SD = 4.46$, max = 36), other school-based wellness ($M = 18.87$, $SD = 11.89$, max = 18), nutrition guidelines ($M = 5.75$, $SD = 6.87$, max = 31), and assurances ($M = 0.71$, $SD = 0.46$, max = 6). Two hundred fourteen descriptors were in the final version of the template. Most of the new descriptors were used only once and by officials in one district. Officials in one district used each of the 113 descriptors from the state sample policy without adding additional

goals, and several others left some sample goals out without adding others.

The average score from the content analysis was 44.4 ($SD = 25.8$) of 113 for total points and 5.9 of 7 ($SD = 1.5$) for global points. Pearson correlation (two-tailed test) indicates having a higher global score was correlated with more policy points ($r = .70, p = .01$).

Influence of Gathering Information From Stakeholders

The Child WIC and Reauthorization Act of 2004 requires that stakeholders provide input for six areas during the development of the local wellness policy. These required areas are (1) the food service director, (2) a school administrator, (3) a parent, (4) a school board member, (5) a student, and (6) a member from the public.

About 21% ($n = 50$) of district officials met both the seven global requirements and the criteria for gathering input (e.g., complete committee). Small differences in average total policy points were observed when comparing districts whose officials gathered input from the required stakeholders ($M = 41.47, SD = 28.44$) and districts whose officials did not include all stakeholders in developing the policy ($M = 46.19, SD = 23.95$; $ES = 0.18$). The overall frequency of goals used and the number of times policy goals from the state sample policy template were modified are shown in Table 4. For example, “daily” could have been modified to “recommend daily.”

Table 4
Frequency of Inclusion of Sample Policy Subgoals and Descriptors

Policy goal and subgoal	Sample policy possible points	Frequency of occurrence	Number of districts that modified goal (of 299)
Physical activity goal points	25	89%	92
Physical education subgoal points	7	83%	21
All grades (K–12)	1	68%	1
Certified teacher	1	67%	0
50% of class is moderate to vigorous	1	59%	5
Inclusion of students with disabilities	1	59%	0

Table 4 (cont.)

Policy goal and subgoal	Sample policy possible points	Frequency of occurrence	Number of districts that modified goal (of 299)
Specified 150 and 225 min	1	21%	4
Prohibit exemptions	1	5%	8
Daily	1	4%	3
Recess subgoal points	4	72%	23
Physical activity integrated subgoal points	4	64%	1
Will not use physical activity as punishment	1	37%	17
Will not withhold physical activity as punishment	1	33%	25
After-school subgoal points	4	25%	4
Safe routes to school subgoal points	4	5%	1

Influence of Having a Physical Education Teacher on the Committee

In over three quarters (75.9%) of the districts, at least one PE teacher was on the committee. Three aspects of the policy were identified a priori as most likely influenced by a physical educator: the PE subgoal, the PA goal, and the nutrition education goal. Physical educators often teach health or are certified to teach health, and nutrition is a component of health education. Three *t* tests were used to compare the number of goals for PA, $t(297) = 2.29, p = .02$; PE, $t(297) = 2.80, p = .009$; and goal for nutrition education, $t(297) = 1.95, p = .05$, and one significant effect was found after Bonferonni. A physical educator on the committee had a positive effect for the PE subgoal. Effect size for difference between committees with and without a physical educator stakeholder was modest ($ES = .32$) as defined by Hedges and Olkin (1985). The results of the content analysis of the PA goal as well as overall policy information for committees with and without a PE teacher are shown in Table 5. The mean total scores for districts with and without a physical educator

are below 50% of the total points available from the original IASB school wellness policy template.

Table 5
Content Analysis of the Physical Activity Goal From the Local School Wellness Policies, Total Points With and Without Physical Education Teacher

Variable	Points from sample	Points for PE teacher on the committee		Points without PE teacher on the committee		ES
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Total policy points from content analysis	113	46.4	25.89	38.3	24.83	0.31
Physical activity goal points	36	6.90	4.60	5.40	0.79	0.34
Physical education subgoal points	16	3.10	.91	2.40	1.67	0.38
Specified minutes	1	0.26	0.44	0.08	0.27	0.43
All grades (K–12)	1	0.72	0.45	0.56	0.50	0.34
MVPA 50% of class	1	0.63	0.50	0.51	0.50	0.24
Certified teacher	1	0.69	0.46	0.59	0.50	0.21
Appropriate equipment budgets	1	0.03	0.16	0.00	0.00	0.21
Inclusion of disabilities	1	0.61	0.49	0.51	0.50	0.20
Daily	1	0.05	0.22	0.02	0.09	0.18
Graded as part of overall GPA	0	0.01	0.10	0.00	0.00	0.11
Standards-based curriculum	0	0.01	0.10	0.00	0.00	0.11
Prohibit exemptions	1	0.03	0.33	0.02	0.13	0.03
Standardized fitness screenings	0	0.03	0.16	0.03	.18	0.00
Student–teacher ratio	1	0.00	0.07	0.02	0.13	–0.23
Recess subgoal	7	2.40	1.79	2.00	1.74	0.22
After-school subgoal	4	0.40	0.74	0.15	0.36	0.37

Table 5 (cont.)

Variable	Points from sample	Points for PE teacher on the committee		Points without PE teacher on the committee		ES
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Safe routes to schools subgoal points	4	0.16	0.71	0.02	0.13	0.22
Physical activity integrated goal	6	1.85	1.67	1.75	1.54	0.06
Will not withhold physical activity	1	0.37	0.46	0.36	0.51	0.02
Will not use physical activity as punishment	1	0.37	0.49	0.40	0.52	−0.06

In the IASB template, other school-based wellness activities included four subgoals: integrating PE into the classroom, communication with parents, food marketing in schools, and staff wellness. The results of the content analysis of the nutrition education goal as well as other school-based wellness activities acquired from policy data for committees with and without a PE teacher are presented in Table 6.

Table 6
Content Analysis of the Local School Wellness Policy and the Nutrition Education and Other School-Based Wellness Activities Goal

Variable	Physical education teacher on committee (<i>n</i> = 182)		No physical education teacher on committee (<i>n</i> = 59)		ES
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Nutrition Education Goals	4.63	2.98	3.72	2.73	.31
All grades	0.58	0.49	0.53	0.49	.10
Vertical and horizontal curriculum	0.51	0.48	0.42	0.45	.18
In health class	0.50	0.50	0.37	0.49	.25
Integrated	0.50	0.50	0.49	0.50	.01

Table 6 (cont.)

Variable	Physical education teacher on committee (<i>n</i> = 182)		No physical education teacher on committee (<i>n</i> = 59)		ES
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Developmentally appropriate	0.36	0.48	0.27	0.45	.19
Promotes fruits, vegetables, grains, etc.	0.64	0.48	0.58	0.50	.13
Energy balance	0.51	0.50	0.41	0.50	.21
Links with food	0.37	0.49	0.25	0.44	.25
Media literacy	0.06	0.24	0.00	0.00	.29
Staff development	0.41	0.49	0.28	0.46	.27
Other School-Based Wellness Activities Goals	19.41	12.06	17.23	11.33	.18
Communicate with parents goal	0.62	0.49	0.58	0.50	.09
<i>Subgoals</i>	2.14	2.16	1.68	2.05	.21
Food marketing in schools goal	0.42	0.49	0.42	0.50	−.02
<i>Subgoals</i>	0.95	1.37	1.02	1.43	−.05
Staff wellness goal	0.51	0.5	0.48	0.50	.07
<i>Subgoals</i>	1.16	1.56	0.81	1.29	.24
Assurances	0.71	0.45	0.68	0.47	.07
Nutrition guidelines	6.44	7.04	3.63	5.94	.41

Monitoring

By law, a monitor must be designated in district policy to oversee the implementation of school wellness policies. In this study, a monitor was named in 81% of districts, and that monitor was always the superintendent. The position of the person designated to monitor the policy was asked for in an open-ended survey question. According to survey data, in 35% (*n* = 82) of all districts with a monitor (*n* = 237), the superintendent was identified as monitor. Conversely, policy data indicate the superintendent is monitor for 100% of districts in which monitoring is occurring (*n* = 195). The percent agreement between survey and policy monitoring data was 39%. That

is, when the superintendent was identified as monitor in the district policy, the superintendent was also identified as monitor on the survey 39% of the time ($n = 75$). Descriptive frequency data indicated that in districts where a monitor was designated in the survey but not the policy ($n = 45$) the principal was identified most frequently as monitor (22%, $n = 10$), followed by superintendent (16%, $n = 7$), and food service director (11%, $n = 5$). The term *administration* was also used to identify the monitor five times (11%). According to survey data, when the superintendent was not monitoring, it was most likely the principal (11%, $n = 26$), administration (8%, $n = 19$), or the food service director (6%, $n = 13$).

Survey data indicated that in 58% of districts ($n = 139$), at least one needs assessment was conducted. Of the districts where assessment occurred, the Iowa State University Online Assessment (40%, $n = 56$) was most frequently used. District officials also reported using the School Health Index (20%, $n = 48$), Changing the Scene (8%, $n = 20$), or another type of assessment (17%, $n = 36$) that was typically their own creation. In 21 districts, more than one needs assessment was used. It was stated in most district policies (74%, $n = 178$) that the committee will continue to meet. However, continuing to meet was not associated with an increase in policy points.

Having a plan to measure implementation helps ensure compliance to the federal mandate. Presence of a monitor explained a significant proportion of variance in total policy points, $R^2 = .53$, $F(13, 227) = 19.66$, $p < .01$. Stepwise linear regression showed that three monitoring characteristics significantly predict the overall policy points: having a school designee monitor implementation, $\beta = .66$, $t(227) = 2.30$, $p = .02$; having a district school meals initiative report $\beta = .16$, $t(227) = 2.48$, $p = .01$; and planning to assess at the building level, $\beta = .17$, $t(227) = 2.21$, $p < .03$.

Discussion

The goal of the federal legislation requiring local school wellness policies is to improve student health and reduce childhood obesity. Sample wellness policies at the national and state level were developed to guide local district administrators to develop policies that would meet the requirements in the law and the goals of the legislation. In most sample policies, several options were provided for each of the goals (e.g., nutrition education, PA, and other school-based wellness). Many also included goals that were not required in the legislation (e.g., school meals). Two reasons the samples includ-

ed multiple options were to address local situations and to describe the best practices of healthy schools. In most of the samples, it was suggested that school administrators select one or more of the options based on the local needs and conditions.

Many sample policies had general statements, for example, “All students in grades K–12 will have opportunities, support, and encouragement to be physically active on a regular basis” (NANA, 2005), followed by the options describing how districts will accomplish the goal. The sample options following the NANA goal included PE, recess, after-school programs, safe routes to school, use of facilities, and PA and punishment. The goal is directed at grades K–12, yet the recess goal is focused on elementary students and, if selected alone, would not achieve the goal. The choices selected by district officials provides an interesting picture of what stakeholders value and where further advocacy and education are necessary to ensure healthy school PA and nutrition environments. The sample policy provided to Iowa schools was based on the NANA sample policy with few modifications.

Of the school districts participating in this study, 21% had wellness policies in which all requirements of the Child Nutrition and WIC Reauthorization Act of 2004 were addressed. In two studies of wellness policies in other states, the requirement to provide assurances was not considered (Metos & Nanney, 2007; Serrano et al., 2007). There were policies in which assurances were provided, but in which other aspects of the requirements were not covered. The primary omission in this sample was assurances that school meal programs are not more restrictive than federal guidelines. All federal requirements that were not related to assurances were met in only 8% ($n = 20$) of the districts.

Unfortunately, the mean total scores for districts with and without a physical educator are below 50% of the total points available (Table 5) from the original IASB school wellness policy template. In most educational settings, this would be a failing score. Clearly, not all school district officials were using the IASB sample wellness policy template to develop their own school wellness policy. In Table 5, there is large standard deviations between the Physical Education and No Physical Education groups. In most cases, the standard deviations were greater than 50% of the mean. This amount of variability warrants further examination of additional factors beyond committee membership that may also influence the overall wellness policy content analysis.

As aforementioned, the Child Nutrition and WIC Reauthorization Act of 2004 requires local school wellness policy committee membership from (1) the food service director, (2) a school administrator, (3) a parent, (4) a school board member, (5) a student, and (6) a member from the public. Many district officials did not gather input from all stakeholders (38% met all seven other requirements). In those districts where all eight were identified, the policies were more robust, although a small effect ($ES = .18$). In most of the state sample or model wellness policies, including the IASB sample wellness policy, examples of assurance separate from the nutrition guidelines were not provided. In part, this may have been because at the time the sample policies were developed, no guidance was available about how, when, and who would monitor the federal legislation. School meal programs were monitored, and the district officials may have assumed the assurances were provided through the existing monitoring by the USDA. Currently, members from several states in the National Association of State Boards of Education (NASBE) have developed systems to monitor the local wellness policies, and USDA officials have developed monitoring guidance for agency officials supervising the child nutrition programs. As school district officials revisit wellness policies, addressing those assurances is clearly one aspect of the policy they should consider.

School district officials may have selected options that were already in place in the district. Clearly, this was not consistent with the intention of the legislation or with the intent of the sample policies. The intention of the legislation and of the sample policies was to support and promote improved school health behavior and elicit change. The key indicator that schools may have selected goals that were already in place was that many policies did not include any plan to measure or monitor implementation. There would be no reason to monitor or measure if the goals had been accomplished and no change was expected.

The global score was a sufficient indicator of whether all seven federal requirements were addressed in the policy and whether the quality of the policy was based on the total policy points. However, based on the results of this study, as school officials consider continuous improvement and measuring implementation, an in-depth examination of the policy would be helpful. The overall goal of the local school wellness policy is to improve children's health by making positive changes in the school nutrition and PA environment. To ac-

comply with this, a careful examination of school nutrition and PA policies is critical. As aforementioned, the global criteria for PA could be met by stating an existing practice in the district, and there is no way to determine this by looking at the policy. Another approach evident in the policies was to make recommendations rather than requirements. The policies evaluated for this study indicated that PE was a primary PA strategy for improving children's health. Certainly, this was a positive finding; however, practical challenges are faced in districts as indicated by the selection of less costly components of the PE goal such as moderate to vigorous PA for 50% of the class. District officials selected information from the sample policies and modified information from the samples. In Table 3, overwhelmingly the most frequently modified PA goals were withholding PA as punishment (32%) and use of PA for punishment (19%). Modification typically involved substituting the word *may* for the word *will* or the phrase *will encourage*. Although this modification may only appear as a slight change of semantics, it represents contrast in how students may be punished in schools, assuming there is a level of "buy-in" by the teachers in these districts. District officials also created their own language and subgoals for policies. The sample policy included 113 subgoals and descriptors for subgoals, whereas the final data set had nearly double that number (214). Recess, after-school programs, integrating PA into the school day, safe routes to school, and use of school facilities were not primary strategies based on the frequency of inclusion in the policies.

In districts with committees comprising at least one parent, student, representative of the school food authority, school board, school administrators, and the public, policies were produced that were only slightly different in terms of points, global goals, PA goals, and PE goals, than in schools that were missing one or more types of committee members. Similarly, increasing the number of committee members had no effect on these same variables. Smaller committees or committees comprising interested individuals may have been more efficient and effective, and larger committees may have had more difficulty reaching consensus. Intuitively, having a PA expert on the committee would have been advantageous. It is possible that a physical educator was provided on most committees to provide that expertise. Only the PE subgoal was better for policies with a physical educator on the committee.

Specific aspects of the PE subgoal that were influenced when a physical educator was on the committee were the PE minutes ad-

addressed in the policy ($ES = .43$) and PE for grades K–12 ($ES = .34$). The PA goal points were also positively influenced by having a PE teacher on committee (6.9 vs. 5.4, $ES = .34$), particularly the goals for after-school activity ($ES = .37$). Although the statistical significance of these reported effect sizes are small to medium (Cohen, 1992), there is a practical significance to these differences. Physical educators serving on the local wellness policies appeared to play a meaningful role. All but two PA goals were better with physical educators on the committee. A pivotal yet frequently overlooked function of effective PE programs (and teachers) is increasing PA for students beyond the PE class. The increased quality of PA goals, after-school PA in particular, may have been indicative of the desire of physical educators to impact PA patterns in their students and address perceived barriers to after-school PA.

In this study, there were instances when it would have been better practice for committee members to ignore some goals because, as written, they were contradictory to what a PE teacher should be trying to accomplish. Perhaps the most noticeable instance was allowing exemptions (e.g., members of an athletic team) to PE. Ironically, a PE teacher was on every committee whose members allowed such exemptions ($n = 7$).

Moderate to vigorous PA during class as a descriptor may have been included for several reasons. Increasing the amount of moderate to vigorous PA during PE is a low-cost goal. However, an alternative explanation is that PE teachers were looking for outside support to assist with motivating and enforcing moderate to vigorous PA in their classes.

Several explanations for the positive impact of physical educators on the committee are possible; one is that on committees with no physical educators, the members were less likely to know about the recommendations related to PE and PA (Pate et al., 2006). Physical educators may have been effective advocates, or district officials asking physical educators to serve on committees may have been predisposed to be supportive of PE and PA. The small (but meaningful) effect sizes reported earlier warrant an understanding for why there was not a more significant difference between the committees. It is possible that the efforts of many (physical and health educators, professional groups, the First Lady, public media, etc.) have had an impact and that members of these committees were aware of the benefits of attending to PE and PA.

The plan for measuring implementation and monitoring was a significant predictor of policy points. For this study, selecting a

school designee, filing a district School Meals Initiative (SMI) report, and planning to assess at the building level were steps associated with a more robust local wellness policy. Measuring progress would be critical to achieving the goals or establishing compliance. Logically, in districts with true goals, officials would be more likely to have plans for evaluating those goals, and in districts without plans for measuring implementation, officials may not need a plan because no change is expected. As district officials consider how to revise goals, either to meet the federal requirements or to improve continually, physical educators are likely to be involved. It is critical to develop methods to verify reports of implementation and consequences (positive and negative) tied to levels of implementation.

According to Payne (2008), there is a disconnect between policy and practice in most schools. Regarding implementation, Payne suggested starting from the bottom, meaning local school wellness policy decisions stem from the schools and classrooms instead of higher level interventions from the school district or even nationwide. Researchers should examine (1) the monitor's (administrator's) stance on the importance of PA, (2) the actual implementation of policies (e.g., are there identifiable factors that are different between high and low degrees of wellness policy implementation?), and (3) the overall impact of school wellness policies on school districts.

References

- Abes, E., Jackson, G., & Jones, S. (2002). Factors that motivate and deter faculty use of service-learning. *Michigan Journal of Community Service Learning*, 9(1), 5–17.
- Action for Healthy Kids. (2006). Wellness policy fundamentals: Key considerations as you develop your local wellness policy. Retrieved January 17, 2007, from <http://www.actionforhealthykids.org>
- American Academy of Pediatrics. (2006). Active healthy living: Prevention of childhood obesity through increased physical activity. *Pediatrics*, 117, 1834–1842.
- Centers for Disease Control and Prevention. (2007). The social-ecological model: A framework for prevention. Retrieved April 30, 2007, from http://www.cdc.gov/ncipc/dvp/Social-Ecological-Model_DVP.htm
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112, 155–159.

- Dietz, W. H. (1998). Childhood weight affects adult morbidity and mortality. *Journal of Nutrition*, 128, 411–414.
- Dietz, W. H. (2004). The effects of physical activity on obesity. *Quest*, 56, 1–11.
- Hedges, L. V., & Olkin, I. (1985). *Statistical methods for meta-analysis*. Orlando, FL: Academic Press.
- Institute of Medicine of the National Academies. (2004). *Progress in preventing childhood obesity: How do we measure up?* Retrieved October 8, 2006, from Robert Wood Johnson Foundation website: http://www.rwjf.org/files/research/IOM_0906_01Front%20matter.pdf
- Institute of Medicine of the National Academies. (2005). *Preventing childhood obesity: Health in the balance*. Washington, DC: The National Academies Press.
- Iowa Association of School Boards & Action for Healthy Kids. (2007). School wellness policy: Support materials and resources. Retrieved January 12, 2007, from <http://www.ia-sb.org/WorkArea/showcontent.aspx?id=1588>
- Koplan, J. P. (2005). *Preventing childhood obesity: Health in the balance*. Washington, DC: National Academies Press.
- Koplan, J. P., Liverman, C., & Kraak, V. (2005). *Preventing childhood obesity: Health in the balance* (Free Executive Summary). Retrieved October 8, 2006, from Association of Public and Land-Grant Universities website: <http://www.nasulgc.org/foodsociety/meeting05/childobesity.pdf>
- Metos, J., & Nanney, M. (2007). The strength of school wellness policies: One state's experience. *Journal of School Health*, 77, 367–372.
- National Alliance for Nutrition and Activity. (2005). Model school wellness policies. Retrieved November 1, 2006, from <http://www.schoolwellnesspolicies.org/>
- National Association for Sport and Physical Education & American Heart Association. (2006). *2006 shape of the nation report: Status of physical education in the USA*. Reston, VA: National Association for Sport and Physical Education.
- National Association of State Boards of Education. (2000). *Fit, healthy, and ready to learn: A school healthy policy guide*. Retrieved November 1, 2006, from <http://www.nasbe.org/HealthySchools/fithealthy.mgi>

- Pate, R. R., Davis, M. G., Robinson, T. N., Stone, E. J., McKenzie, T. L., & Young, J. C. (2006). Promoting physical activity in children and youth: A leadership role for schools. *Circulation*, 114, 1214–1224.
- Payne, C. M. (2008). *So much reform, so little change: The persistence of failure in urban schools*. Cambridge, MA: Harvard Education Press.
- Sax, L., Austin, A., Korn, W., & Gilmartin, S. (1999). *The American college teacher*. Los Angeles, CA: Higher Education Research Institute.
- Serrano, E., Kowaleska, A., Hosig, K., Fuller, C., Fellin, L., & Wigand, V. (2007). Status and goals of local school wellness policies in Virginia: A response to the Child Nutrition and WIC Reauthorization Act of 2004. *Journal of Nutrition Education Behavior*, 39, 95–100.
- School Nutrition Association. (2005). School Nutrition Association local wellness policy recommendations. Retrieved September 10, 2006, from <http://www.schoolnutrition.org/Index.aspx?id=1075>
- University of California, Berkley/Cooperative Extension. (2000). Childhood overweight: A fact sheet for professionals. Retrieved November 4, 2006, from http://www.cnr.berkeley.edu/cwh/PDFs/color_health_prof.pdf
- U.S. Department of Agriculture (2004). Public law 108-265. Retrieved January 27, 2014, from http://www.fns.usda.gov/CND/Governance/Legislation/Historical/PL_108-265.pdf
- U.S. Department of Agriculture. (2006). Local school wellness policy. Retrieved November 11, 2006, from <http://www.fns.usda.gov/tn/healthy/wellnesspolicy.html>
- U.S. Department of Health and Human Services (2001). *The Surgeon General's call to action to prevent and decrease overweight and obesity*. Retrieved October 9, 2006, from <http://www.surgeongeneral.gov/topics/obesity/calltoaction/CalltoAction.pdf>
- Wechsler, H., McKenna, M. L., Lee, S. M., & Dietz, W. H. (2004). The role of schools in preventing childhood obesity. *The State Education Standard*, 2004, 4–12.

PEDAGOGY

Kinesiology Career Club: Undergraduate Student Mentors' Perspectives on a Physical Activity– Based Teaching Personal and Social Responsibility Program

David S. Walsh, Maria J. Veri, Jason J. Willard

Abstract

The purpose of this article is to present university student mentors' perspectives on the impact of a teaching personal and social responsibility (TPSR) model youth program called the Kinesiology Career Club. Data sources in this qualitative case study included program observations, mentoring reflections, and semistructured interviews. Data analysis produced 320 raw meaning units coded into two high-level themes, six mid-level themes, and 14 low-level themes. Findings indicate that high school participants are able to transfer TPSR goals to their possible futures, explore kinesiology and other careers of choice, and effectively address potential life hopes and fears. Service learning–based outcomes of personal, intellectual/career, and social/community influence for the university student mentors were also revealed in the findings.

David S. Walsh is a professor, Department of Kinesiology, San Francisco State University. Maria J. Veri is an associate professor, Department of Kinesiology, San Francisco State University. Jason J. Willard a former graduate student in the Department of Kinesiology, San Francisco State University. Please send author correspondence to David S. Walsh, San Francisco State University, 1600 Holloway Ave., Gym 101, San Francisco, CA. 94132. E-mail: dwalsh@sfsu.edu

Transitioning from today's school to tomorrow's career is an important and challenging task assigned to adolescents (Benson & Scales, 2004). The window of time for this task begins in high school and extends through college for 66% of Americans (Bureau of Labor and Statistics, 2012). However, college is less of a possibility with a staggering 42% of urban minority youth not graduating from high school (Balfanz, Bridgeland, Bruce, & Hornig-Fox, 2012), a statistic which is linked to fewer role models and a higher exposure to unemployment, poverty, crime, and other social risk factors (Tsoi-A-Fatt, 2008). Youth programs in which effective strategies are provided to help in the developmental process of linking present school with potential adult possibilities are limited (Oyserman, Terry, & Bybee, 2002). High school should be a preparatory experience in a young person's life, especially with graduation from high school, going to college, and ultimately becoming productive citizens being favored in society. However, high school is the end of the educational line for many youth and the last opportunity to instill effective specialized youth development programs designed to help them envision their positive possible futures.

Programs in the field of youth development are holistic, strength based, and focused on the emotional, social, cognitive, and physical self. They include helping youth obtain vocational and avocational skill development (Petitpas, Cornelius, Van Raalte, & Jones, 2005), supporting their explorations, and identifying opportunities to make significant contributions to society (McLaughlin, Irby, & Langman, 1994). While youth development research is growing and researchers have consistently reported positive program effects with holistic development (Wright, Li, Ding & Pickering, 2010), limited research has been conducted on how to help youth from underserved communities envision their positive possible futures.

Teaching Personal and Social Responsibility Model

Hellison's teaching personal and social responsibility (TPSR) model has been well-documented for over 40 years, with several researchers showcasing successful impact in their studies (e.g., Hellison, 2011; Hellison & Walsh, 2002). TPSR has become a benchmark in physical activity-based youth development, with a latest creation specifically designed to help youth envision positive possible futures. Called Career Club, the program was first introduced to promote the development of possible selves that could help youth become involved and connected with school and their futures. This

initial attempt was effective in providing a meaningful career exploration (Walsh, 2008). Lessons learned from the first attempt led to a new approach called the Kinesiology Career Club (KCC), which is the focus of this study (Walsh, 2012). Research has indicated that KCC was successful in helping students connect the TPSR goals of respect, effort, goal-setting, and leadership skills to possible futures; envision and explore a career in kinesiology; and link kinesiology to positive possible futures. Results were mixed in demonstrating a balance of hopes and fears as suggested by the theory of possible selves. The development, implementation, and research of TPSR was extended through the study; however, it is only the second attempt with “possible futures” as the main emphasis. Findings indicate that KCC is an effective TPSR program, but it is still in its infancy and in need of further research (Walsh, Veri, & Scobie, 2012).

KCC is also a university–community outreach effort with a service-learning component. University students enrolled in a service-learning course taught by the KCC program director, who is a professor in the Kinesiology Department. In the course syllabus, reading and reflection assignments based on a youth development textbook and journal articles to guide the service-learning experience were outlined. Site-specific assignments included mentor reflections and program observations. Postprogram interviews were also conducted with the participating university students. The purpose of this article is to present university student mentors’ perspectives on the impact of KCC. Examining the mentors’ perspectives on the program, including the service-learning impact, is a crucial component to the efficacy of KCC beyond research previously conducted solely on the youth participants.

Program Description

KCC occurred at a low-performing inner-city high school on the west coast of the United States. The program operated during second period physical education class for 10 to 12 weeks in fall and spring semesters on Tuesday and Thursday mornings for 75 min. The class consisted of mostly freshmen and sophomores. The physical education teacher and KCC program director recruited the KCC participants out of 45 youth in the physical education class. They selected most of the freshmen and a few sophomores. The physical education teacher assigned four of the youth participants to the KCC because they needed extra help due to not performing well academically, getting in trouble in school, or having difficulty at

home. The university students, who are the focus of this study, took on roles as mentors and assistant instructors of KCC, which fulfills the service component of the internship. The TPSR lesson plan format as follows was used in the KCC: relational time, awareness talk, physical activity lesson, group meeting time, and a combined reflection–mentoring session.

Program Format

KCC is delivered in four distinct phases. Each phase lasts approximately 3 weeks. For a more in-depth explanation of the phases and the service-learning component of KCC with a description of how the undergraduate students mentored the high school participants, see Walsh (2012). The following is a summary of the goals of each phase.

Phase 1 Goals

For Phase 1 goals, the TPSR daily format and strategies to introduce the program are used, including the various physical activities. This phase is focused on Level 1, respect, and Level 2, effort. Program leaders aim to begin building relationships with the students, have them voice their opinions about the program content and structure, and introduce the field of kinesiology. Leaders also introduce the combined TPSR reflection time and mentoring time. Mentoring time is a significant component for the positive “possible futures” emphasis throughout the program. Mentors talk about their choice to study kinesiology, connect the physical activities in KCC to the basis and foundation of the field of kinesiology, and encourage the youth participants to talk about their own career interests. Mentors also bridge Levels 1 and 2 to how to be successful in kinesiology, such as putting forth a lot of effort to get good grades and earn a college degree.

Phase 2 Goals

In Phase 2, students begin to feel empowered to take on the advanced TPSR responsibilities of Level 3, goal-setting, and Level 4, leadership. Students are asked to set goals in martial arts, weight training, dance, or fitness activities. They are also encouraged to take on small leadership experiences and teach the activities on which they worked during goal-setting time. Leaders encourage them to consider a career in at least one of the many subdisciplines of kinesiology; connect the physical activities, goal-setting, and leadership in the program to being successful in the field of kinesiology; and

begin to chart the steps to earning a college degree in kinesiology. Leaders also aim to have youth participants reflect on what they are currently doing in school and out of school that helps and hinders their futures.

Phase 3 Goals

In Phase 3, students are encouraged to continue to work on TPSR Levels 1 to 4. Goal-setting time and leadership roles are extended with more responsibility. Program leaders introduce the potential transference of the steps to a career in kinesiology with the necessary steps for the students' future careers of choice. The goal is to link Phase 2 experiences of understanding how to be successful in kinesiology to understanding how to be successful in their own careers of choice. Students actively reflect on what they would like to pursue as a career, effectively discovering ways to link what they learned about kinesiology to their own future career interests. Leaders also introduce the importance of having potential hopes and potential fears—as suggested by the theory of possible selves (Oyserman et al., 2002)—and having the hard work, positive attitude, and preparation needed to be successful.

Phase 4 Goals

Level 5 involves the transfer of Levels 1 to 4 outside of the gym, and youth participants are told how what they do in school, at home, and in the streets impacts their futures. Phase 4 discussions are focused solely on students' careers of choice. Leaders further highlight the connection between TPSR levels and what may be necessary for the practical realization of their possible futures, including potential hopes and fears. Leaders provide additional insight into the degree of hard work, positive attitude, and preparation needed toward the realization of their possible futures. The possibilities are endless and reflect current career interests of the students (e.g., firefighter, doctor, professional athlete, coach, teacher, construction worker). Mentors continue and complete charting the steps for students' careers of choice and provide extra documentation related to their choices.

Methods

Design

A qualitative case study design to examine the mentors' perspectives on the impact of KCC was employed in this study. Case study

methodology is appropriate when answering a descriptive question (e.g., What are the mentors' perspectives of the impact of KCC?) and is commonly used in program evaluation (Yin, 2009). Furthermore, evaluation case studies as a form of qualitative research have the elements of a good story with the purpose of understanding the program outcomes to make future decisions about the program (Patton, 2002). KCC is a service-learning program; therefore, it is important for the research team to evaluate the program and inform the direction of future youth development service-learning programs.

Participants and Setting

Eight students (4 males, 4 females) from a large west coast metropolitan university were selected to participate in KCC's service-learning internship for one semester. All students were kinesiology majors in their senior year of study. Service for this internship occurred at a low-performing inner-city high school. The graduation rate for this school was 72.73% for the semester of this study, which is below the national average, and more than two thirds of the student body qualified for "free" or "reduced"-cost lunch (San Francisco Unified School District, 2013). The school has a diverse population with the following breakdown: 14% African American, 23% Asian, 46% Latino, 9% White, and 8% Other.

Data

The data set was mined from three data sources for triangulation purposes: program observations, mentor reflections, and semistructured interviews. Researchers of good case studies benefit from using several sources of evidence (Yin, 2009). Mentors are referred to by pseudonyms throughout the study.

Program Observations

The first data source was the mentors' program observations, which were made in response to the goals of the program, high school students' responses to the program, and mentors' perceived impact of the program. Mentors recorded answers to questions on a weekly basis (every two sessions). Sample questions included "How did the participants handle their responsibilities?" and "Are the participants getting a better sense of their future?"

Mentor Reflections

At the end of each KCC session, a dedicated mentoring session between the university mentor and his or her designated youth par-

ticipant occurred. The mentors' reflections made up the second set of data for this study and were collected on a weekly basis (every two sessions). Reflections were focused on how mentors were making connections with students and what they were doing to help students work on the KCC goals. Reflective questions were aligned with the specific phases of the program. Sample questions included "What details did you learn about the participants?", "How did you connect TPSR goals to your kinesiology experiences?", and "In what ways did you connect goal-setting and leadership with the physical activities to being successful in kinesiology?"

Semistructured Interviews

The third data source included transcripts from semistructured interviews conducted with the mentors. The second author conducted one-on-one interviews with mentors at the end of their participation in KCC. Open-ended questions were used to gain relevant program information and perceptions from the mentors about each phase of KCC and its overall impact on the youth participants. The mentors were also asked about the influence of KCC on their lives and career aspirations. Questions included "Can you tell me about what the participants shared with you regarding what they hope to become?" and "Can you share an example of how KCC helped a participant think about their future college experience?"

Data Analysis

Data were analyzed in three phases: discovery, coding, and discounting (Taylor & Bogdan, 1984). During discovery, questions from each data tool were read one at a time followed by all responses to that particular question. Word processing was used to organize the data in this fashion. Data were reviewed multiple times to increase familiarity. Annotations were made to help interpret data and any emerging themes were tentatively or "soft" coded. During the coding phase, a master inventory of codes (raw meaning units) and themes was produced. A raw meaning unit is a quote or excerpt that captures a particular thought (Côté, Salmela, Baria, & Russell, 1993). Deductive analysis was used to code responses related to program goals, and inductive analysis was used to code for emerging themes. Amis (2005) believes this combined approach is appropriate for conducting qualitative studies. In deductive analysis, themes are developed from similar responses to the same question. For example, if several responses to the same question indicated

that participants exhibited a program goal of leadership, a deductive theme was coded as “LEAD.” Inductive themes are recurring responses that are not tied to any particular question; they are not known ahead of time (Merriam, 2009). Triangulation was used to corroborate data and validate identified themes. This involved verifying the data across all three data sources and across all perspectives. Electronic versions of all three data sources were obtained from the participants and stored on a hard drive. Print copies of all documents were also obtained and stored according to their respective source name: “interviews,” “observations,” and “reflections.”

Findings

The purpose of this data analysis was to examine the mentors’ perspectives on the impact of KCC. In the data analysis, 320 raw meaning units were produced. These raw meaning units were coded into two high-level themes, six mid-level themes, and 14 low-level themes (see Table 1).

Table 1
Results Summary of Themes and Raw Meaning Units

- 1. Positive Perception of KCC Goals
 - a. Transfer of TPSR Goals (7, 54)
 - i. Respect (4, 7)
 - ii. Effort (4, 5)
 - iii. Goal-setting (6, 30)
 - iv. Leadership (5, 12)
 - b. Career Exploration (8, 84)
 - i. Exploring kinesiology careers (8, 23)
 - ii. Exploring careers of choice (8, 61)
 - c. Hopes and Fears (8, 64)
 - i. Hoped-for-selves (8, 23)
 - ii. Feared-selves (8, 23)
- 2. Service Learning Impact
 - a. Personal Outcomes (8, 35)
 - i. Personal fulfillment (8, 28)
 - ii. Self-discovery (4, 7)

Table 1 (cont.)

b. Intellectual/Career-Based Outcomes (7, 15)
i. Career aspirations (7, 12)
ii. Life perspective (3, 3)
c. Social/Community Outcomes (8, 68)
i. Impact of mentorship (8, 40)
ii. Impact of civic engagement (7, 28)

Note. Qualitative themes are quantified with the use of two numbers (x, y), with x representing the number of mentors that provided data that support a particular theme and y representing the number of raw meaning units assigned to that particular theme. The two high-level themes are preceded by numbers. The six mid-level themes are preceded by lower-case letters. The 14 low-level themes are preceded by lower-case Roman numerals.

(1) Positive Perceptions of KCC Goals

In interviews, reflections, and program observations, mentors provided evidence of the achievement of stated KCC goals. Their positive perceptions were mostly related to the mid-level themes of (a) transfer of TPSR goals to possible futures and (b) career exploration.

(a) Transfer of TPSR goals to possible futures (7, 54). Developing respect, effort, goal-setting, and leadership skills and then transferring those skills outside the gym is paramount to any TPSR program. One of the unique aspects of KCC is being able to link the importance of these goals with possible futures. Seven mentors provided a total of 54 raw meaning units that provided evidence of linking TPSR goals with possible futures (7, 54). This theme is represented across four low-level themes: (i) respect, (ii) effort, (iii) goal-setting, and (iv) leadership.

(i) Respect (4, 7). Four of the eight mentors described participants as able to link respect to their futures. For example, Joseph noted in a mentor reflection, “[A youth participant] explained that respect is important in the work field because you have to show respect to your boss if you want to continue working or striving for a promotion.” Jennifer reflected, “The kids are becoming more aware of the respect you need to give to receive. They are learning from their experiences teaching their peers,” indicating a connection between leadership and respect. In his interview, Keenan was asked if

mentees were connecting respect to their futures; he replied, “I think [a youth participant] understands it and applies it.”

(ii) Effort (4, 5). According to mentors, youth participants also viewed effort as being important for their futures. Cleo wrote in a mentor reflection that his mentee told him, “How far you can get depends on how much effort you put in.” Keenan wrote in a program observation, “They are starting to understand the importance of respect, effort, leadership, and goal setting.” Janessa reflected that her mentee said, “Effort is important because it keeps him trying to achieve his goal and not give up.” Half of the mentors provided data for this low-level theme, mostly in written program observations and mentor reflections.

(iii) Goal-setting (6, 30). According to the mentors, the program participants were able to develop education and career-oriented goals. In a mentor reflection, Cleo recorded that his mentee told him, “Before, I didn’t even have a goal or know anything. Now I at least know that I want to go to college.” Charlene wrote in a mentor reflection that her mentee “understands how goal-setting relates to her career.” In a program observation Brenda wrote, “Some of the kids are really taking the program seriously and talking about bringing up grades and getting jobs to stay out of trouble.” Similarly, Jennifer stated in her interview, “I think almost all the kids had raised their grades, as far as the ones that needed to.” In his interview, Cleo explained, “[A youth participant] was saying like he wanted to get back on the wrestling team or on the football team and he was like raising his grades so he could get back on the team and start playing again.” The students also indicated awareness of goal-setting as a process. When interviewed, Janessa pointed out, “They are also figuring out the importance of setting goals in their lives. They understand that it takes small steps to achieve a single goal.” In a program observation, Jennifer noted, “Not only are they coming up with ideas and goals for their futures, they are planning and discussing with us what it takes to get there.” Overall, the mentors were pleased with their students’ grasp of goal-setting. For example, Keenan observed, “The students that spoke up each had a different goal in kinesiology or about their job which was encouraging, knowing that what we are doing is actually getting through to them and helping.”

(iv) Leadership (5, 12). Five mentors believed the youth participants were able to view leadership as important for their future. Data indicated they gained confidence through leadership tasks and

understood the importance of leadership skills for their future goals. For example, Brenda's mentee told her, "If I want to help people, I need them to listen to me." In a mentor reflection, Cleo stated that his mentee "understood how leadership roles and goal setting, no matter how small, can translate to larger leadership roles and the ability to achieve goals later in life." As noted in a program observation, Jennifer's mentee told her, "I'm getting in shape, and learning about leadership and how to be a good leader."

(b) Career exploration (8, 84). A key goal of KCC was for program participants to learn about careers in kinesiology as a platform for exploring their own careers of choice. They envisioned kinesiology careers and then developed the steps required to achieve those careers. The intent was that this process will, in a later phase of the program, help them command a similar process with a career of choice. In Walsh, Veri, and Scobie (2012), evidence showed how strategically exploring a kinesiology career helped participants begin exploring their own careers of choice. All eight mentors cited evidence of the impact of kinesiology career exploration on students' ability to plan for the future and envision their own careers of choice (8, 84). This theme is represented across two low-level themes: (i) exploring kinesiology careers and (ii) exploring careers of choice.

(i) Exploring kinesiology careers (8, 23). Eight mentors provided 23 raw meaning units, indicating that program participants successfully explored kinesiology careers. In a program observation, Brenda revealed, "This week, the girls I am working with picked some careers in kinesiology that could be interesting to them." In her interview, Janessa stated, "They had no idea what kinesiology was and now [the mentee] is interested in many aspects of kinesiology like coaching, personal trainer, athletic director, and physical education teacher." Several mentors were specific about the kinesiology careers that were selected. Keenan stated in his interview, "We talked about maybe being a ref or a coach and he liked the idea of being a basketball coach." Janessa observed, "I would say they were most interested in the personal training, like being able to help other people." Similarly, Jennifer also observed, "A lot of them liked the coaching and teaching aspect." Exploring a kinesiology career also involved charting steps to success in that particular career. Mentors often described this process as "steps" or "procedural knowledge." Charlene explained in her interview, "We did our procedural knowledge, which was like a little flow chart of how you,

you know, advance and get into college.” In a mentor reflection, Janessa wrote about the impact this process had on her mentee:

The procedural knowledge chart for both of my kids has all their classes, the current and goal grades, their goal GPA, the two tests that they can take to get into college (SATs and ACTs), passing high school and the high school exit exam that their school requires them to take, applying for college and financial aid, declaring kinesiology as their major, and then we are going to go over the classes that they need to take.

Cleo observed his mentee

had a better grasp of how moving through college works and he even expressed a very loose plan of what he wants to do when he finishes high school. He plans on completing high school, going to [community college] and obtaining an associate’s degree, and then going to [a 4-year university] for a bachelor’s degree.

(ii) *Exploring careers of choice (8, 61).* Developing clear and robust kinesiology “charts” with the necessary steps to success was an intentional outcome designed for KCC to increase the likelihood that program participants would have greater success in the ultimate goal of exploring their own careers of choice and charting the necessary steps to success associated with those careers. All eight mentors provided 61 raw meaning units, suggesting that exploring careers of choice had an impact on the program participants. Charlene wrote in a program observation,

Almost all of the students were able to give a career that they may be interested in pursuing. I think that saying it out loud in front of all of their friends and classmates definitely gave them a better sense of their future. It has been truly rewarding to see the transformation among students who had no idea what their future held for them and now they have somewhat of an idea of what they are interested in and possible career choices for those interests.

During this phase of the program, Cleo observed, “I believe that the students are refining what they want to do for careers and are really

starting to think about them.” Janessa wrote in a mentor reflection, “One of my kids wants to be a video game designer and we talked about what kind of school he could go to.” The possibility of attending college came up frequently when mentors described the impact of charting procedural knowledge. In a program observation, Charlene wrote, “My individual mentor student is making great progress in seeing the steps she needs to make in order to make her future dreams a reality.” In a mentor reflection, Brenda explained how she and her mentee “moved up the chart from high school through college graduation to taking the MCAT (Medical College Admission Test) and applying to medical school and the 8 years following that would lead to becoming a specialty physician.” Cleo described a discussion from one of his mentoring sessions in a reflection: “I asked what are your options for college? [His mentee] then explained that he could either choose to go to community college first or try and apply to go directly to a university.” Mentors described some detailed steps that were a part of this exploration process. For example, in a mentor reflection, Charlene wrote, “[We] began to talk about scholarships and she was really interested in the process she must take in order to apply for such scholarships.” One student was interested in becoming a musician, and according to Cleo’s reflection, “His chart included the classes that he can take at high school in order to gain more experience in music.” Furthermore, it was clear that charting steps to success in kinesiology was a helpful link in the process of exploring other careers. In her interview, Brenda stated that her mentee “would always be able to connect kinesiology to her career.” Jennifer also supported this link in a mentor reflection: “This week we compared and contrasted their kinesiology charts to what is starting to be their own individual career charts. The transference of the kinesiology procedural knowledge by linking phase two experiences to their future careers was easy.” Charlene wrote in a mentor reflection, “This chart helped [her mentee] visualize the path she needs to take in order to succeed.” Finally, also of note in this part of the analysis was how exploring kinesiology careers influenced students’ own careers of choice. Keenan reflected about his mentee: “[He] really took to this and is interested in pursuing a career in kinesiology. He wants to be a strength coach for a college sports team.” Jennifer wrote in her mentor reflection, “[She] was able to connect kinesiology to her real dream of becoming a fashion designer by saying she wouldn’t mind designing sportswear or shoes.”

(c) Hopes and fears (8, 64). The KCC is informed by the theory of possible selves, which is predicated on the importance of achieving a balance between hoped-for-selves and feared-selves for enhancing motivation and regulating the direction of behavior (Walsh, 2012). However, little to no stated evidence from mentors that the program participants successfully achieved balance between their hopes and fears was revealed in the data analysis. Seven mentors indicated in their mentor reflections that they discussed the importance of balancing hopes and fears with their mentees, but only one mentor, Janessa, stated that her mentees “have the hopes and fears balance down.” It was revealed, though, that the program participants articulated hopes and fears in discussions with all eight mentors (8, 64). Hopes and fears are presented in the form of two low-level themes: (i) hoped-for-selves and (ii) feared-selves.

(i) Hoped-for-selves. Mentors provided ample evidence (8, 23) of the hopes of their mentees. For example, in her mentor reflection, Jennifer quoted her mentee as saying, “I hope to become a successful, happy person who has realized her life goal.” Cleo stated in his reflections that his mentee hoped to “go to college and get a good job.” In her interview, Janessa recalled that her mentee wanted to “make a lot of money.” Charlene wrote in a program observation that her mentee hoped to “become a doctor that works with children.” In an observation, Keenan wrote that his mentee “mentioned that he wants to get a scholarship to a university for football.” Joseph wrote in a mentor reflection, “[My participant] wants to go to college after he graduates from high school. He plans on studying engineering.” Jennifer’s mentee told her, “She wants to be a fashion designer.” Arthur revealed in his mentor reflections, “Randolph wants to become a lawyer.” Cleo observed, “My participant did tell me that he wants to be a videogame designer when he gets older.”

(ii) Feared-selves. The mentors also described evidence (8, 23) of the fears of their mentees. During his interview, Arthur stated that his mentee “was afraid of being homeless.” Brenda reflected that her mentee was afraid “of becoming addicted to drugs.” Charlene recalled in an interview that her mentee was afraid of “not getting into medical school.” In his interview, Cleo related that his mentee told him, “I just don’t want to get injured again.” In a mentor reflection, Cleo wrote that his mentee feared “going to jail” or “not finishing high school.” Janessa discussed her mentees’ fears in her interview: “Yeah, for them it was just [being] unsuccessful, [fear of having] no friends and no family.” Janessa reflected, “I also learned

that he has ADHD and that is something he fears will be an obstacle in achieving some of his goals.” Keenan wrote in a program observation that his mentee was fearful of “getting a girl pregnant.” Jennifer wrote in a mentor reflection that her mentee was “afraid to become a failure in the future.” Although all eight mentors were able to cite examples of hopes and fears expressed by their mentees, they did not provide evidence that the students achieved a balance between those hopes and fears per the tenets of the theory of possible selves (Oyserman et al., 2002).

(2) Service-Learning Impact on Mentors

Through service-learning courses, students have opportunities to gain valuable experience outside of the classroom and apply research-based theories and concepts to real-world situations (Veri & Walsh, 2012). Research in this area can serve as a guide for analyzing the impact of participation in service-learning programs. For example, Whitley and Walsh (2014) prescribed a framework for implementing and evaluating service-learning courses. The *student proximal outcomes* category of the framework is particularly relevant to this study. Student outcomes are grouped into personal outcomes, academic and intellectual outcomes, and social and community engagement outcomes (Eyler, 2011). To maintain consistency with this framework, service-learning impact data were deductively analyzed and presented across three mid-level themes: (a) personal outcomes, (b) intellectual/career-based outcomes, and (c) social/community outcomes.

(a) Personal outcomes (8, 35). The personal outcomes presented below indicate KCC had a positive impact on mentors across two low-level themes (8, 35): personal fulfillment and self-discovery.

(i) Personal fulfillment (8, 28). All eight mentors described their experiences in KCC as rewarding. Arthur wrote in a program observation, “Just knowing that I’m helping someone towards a better life is really fulfilling.” Charlene observed, “It has been a very rewarding process working with the students.” In his program observation, Keenan stated, “It brings me so much joy knowing that I can have this sort of impact on someone.” During her interview, Jennifer explained,

This is the kind of stuff I love, like I really love kids, and coaching and just being in that position where you’re relating to them, you’re talking to them, getting to know them,

having a positive influence on them. I think the power of that is, like, crazy.

Brenda wrote in a program observation, “I enjoy sharing time with them and talking about what they can do.” Arthur wrote in a program observation, “They are improving my life as much as I know I’m improving theirs.” Charlene wrote in a program observation, “The mentors are feeling great about themselves for being involved in such a project.” Janessa wrote in a program observation, “Even days where I don’t want to wake up and do anything or days that I am really depressed, they always brighten my day.” This low-level theme was not equally represented across all three data sources.

(ii) Self-discovery (4, 7). Data indicate that volunteering in KCC promotes self-discovery. Arthur shared in a program observation, “Deep down, I’m realizing things about myself that I didn’t know before. It’s allowing me to discover more of who I am.” Charlene wrote in a program observation, “I find myself more times than not talking about the program and explaining to people what our goals are and how it has made an impact in my life as well.” Janessa observed, “I am learning so much about myself and about these kids.” Jennifer simply noted in her program observations, “I am learning about myself.” This low-level theme was not equally represented across all three sources.

(b) Intellectual/career outcomes (7, 15). The intellectual and career outcomes that mentors associated with participation in KCC are expressed across two low-level themes (7,15): career aspirations and gained life perspective.

(i) Career aspirations. Evidence indicates that participation in KCC influences perceptions of career aspirations. Four mentors described how participation in KCC prompted them to reconsider their career paths. Arthur claimed in his interview, “It helped me transition like my mentality from I’m gonna go to PT (Physical Therapy) to almost like, I’m not gonna go to PT. I’m at that point where like I’m not gonna go to PT anymore.” Jennifer wrote in a program observation that she now knows, “I would like my career to revolve around youth in some way or another.” As a result of this experience, Brenda said in her interview that she will “probably coach in the future whether it’s high school or college.” Janessa wrote in a program observation, “This program has really gotten me interested in working with high school kids. Now I am considering coaching at high school for their volleyball team.”

For three KCC mentors, their experience in the program confirmed their career aspirations. Charlene pointed out in a program observation, “The program has reminded me how much I enjoy working with children.” Cleo explained in his interview that mentoring high school students through a physical activity program is “directly relatable to what I’d like to be doing.” This low-level theme was not equally represented across all three sources.

(ii) *Gained life perspective (3, 3).* In the program, three mentors gained life perspective. For example, in a program observation, Jennifer shared, “As I teach these life lessons to them I reflect on how I am using them in my own life.” In his interview, Keenan simply said, “They changed my life.” Brenda wrote in her program observation,

Working with kids helps put things in perspective in my life as well. When I talk to the kids about opportunity and possible futures, I realize that I’m not that old either, and I don’t have to rush into a career that will not leave me fulfilled.

This low-level theme was not equally represented across all three data sources.

(c) *Social/community outcomes (8, 68).* Social and community-based outcomes are presented in the form of two low-level themes (8, 68): (i) impact of mentorship and (ii) impact of civic engagement.

(i) *Impact of mentorship (8, 40).* Relationship characteristics associated with mentoring include learning or developing mentoring skills, developing relationships with mentees, and dealing with challenges associated with mentoring. Eight mentors provided 40 raw meaning units through which they described the impact KCC had on their mentoring relationships. After his first day, Cleo revealed in his mentor reflection that he was “already considering new ways to communicate with and encourage his mentee.” Several mentors noted how KCC participation influenced their leadership development. Joseph wrote in a program observation that he felt an increased confidence in his “leadership skills.” In one of her mentor reflections, Brenda shared, “This class is helping me to learn about how I can better coach high school kids and new personal training techniques.” One of the most critical aspects of a strong mentorship is the relationship between the mentor and the mentee. In her program observations, Charlene wrote, “I have developed a bond with

the kids in our program.” In her interview, Jennifer explained that she felt like “their older sister almost, and just created that bond.” Janessa stated in her interview that the mentorship went so well that “I’m actually gonna go coach there next fall.” Keenan poignantly observed,

If it wasn’t for them I might have taken this semester off because of the many difficulties that have been going on outside of school for me. But I didn’t want to leave them stranded, and they kept me motivated to keep going. If they can do it then so can I.

Mentors also described the challenges of mentoring high school students. In her interview, Charlene stated, “Some of the kids would act out and it made it difficult.” Cleo said in an interview that the “largest obstacle” was getting his mentee to “open up.” This low-level theme was not equally represented across all three sources.

(ii) Impact of civic engagement (7, 28). Civic engagement involves value for and commitment to improving the well-being of one’s community and a sense of shared social responsibility among citizens (Veri, 2006). Participation in KCC instilled value for civic engagement among the mentors and facilitated a greater understanding of communities different from their own. During her interview, Brenda shared that her KCC experience “was extremely helpful for [her] as far as working with these kids and getting an idea of, like, how extremely different their upbringing was from [her own].” Cleo noted in his program observations, “I now have a better understanding of the school system, especially in underprivileged neighborhoods, and can see how it isn’t always conducive to the kids’ needs.” Encouraging mentors to engage permanently in youth development community work was not an explicit goal of KCC, yet program data indicate that engaging in this type of work had a great impact on the mentors. They discussed feeling a sense of importance, a sense of civic duty, and a motivation to continue similar work. For example, Charlene shared in her program observations, “It is important for us to be there for [her mentee] and encouraging her in every way, every step of the way.” Arthur wrote in a program observation, “This is really changing the way I feel about how I serve...other than serving myself and for my own good, serving another and helping them for their own good.” In a program observation, Jennifer expressed a desire “to stay involved and assure that they will continue to be

successful through high school and not become that statistic (drop out).” Charlene wrote in a program observation that she wished to “be involved in something like this for the rest of [her] life.” As a result of this experience, Brenda observed, “I think that working with youth is something that I want to be a part of my future.” This low-level theme was not equally represented across all three sources.

Discussion

The purpose of this paper was to present KCC mentors’ perceptions of the impact of the program. Three data sources were analyzed: program observations, mentor reflections, and semistructured interview transcripts. Previous research (Walsh, 2012; Walsh et al., 2012) has indicated that through KCC underserved high school students were successful in envisioning possible futures. The findings from this study indicate that, according to mentors, the KCC program goals of transference of TPSR skills and identification of hopes and fears can be accomplished, but fall short of helping high school students balance hoped-for-selves and feared-selves.

Mentor perceptions indicate that high school participants are able to link the TPSR goals of respect, effort, goal-setting, and leadership to their possible futures. Mentors shared statements from their mentees that demonstrated awareness of the need for respect for a future boss, effort to get through medical school, and leadership to participate in the community. These findings indicate support for transference of TPSR goals among high school students and are consistent with previous research on TPSR and transference (Martinek, Schilling, & Johnson, 2001; Walsh, Ozaeta, & Wright 2010).

According to mentors, KCC participants also successfully navigated career exploration. The mentors discussed how their mentees explored and charted careers in kinesiology. These findings show how high school students can engage in the planning of their possible futures. The capstone task of KCC was for high school students to develop detailed blueprints or procedural charts for careers of choice. For example, Brenda helped her mentee, who aspired to become a physician, to chart a plan of action that outlined the necessary steps from high school to college to medical school and then hospital residency and specialization. There is a great difference between thinking about doing something and documenting the plans to do it. This methodical process could be considered the key component of KCC through which youth were able to envision their own possible careers of interest beyond high school.

The KCC director infused the program with the theory of possible selves to guide participants into balancing hopes and fears associated with career exploration (Yowell, 2000). Although the data indicated that participants identified hopes and fears, only one mentor perceived an actual balance. The ability to articulate hopes and fears was an important achievement for students in KCC, but achieving balance between them was shown to be a difficult task. The findings indicate that the concept of balance needs to be more emphasized in future iterations of KCC for this goal to be achieved.

The findings also indicate that KCC is a successful service-learning program for the university student mentors. Although it is not an explicit program goal, KCC has a positive, and in some cases, profound, impact on the mentors. Many of them considered their KCC experience to be personally rewarding. If we as program planners could communicate the personal gains from service-learning experiences, we may see an increase in enrollment in such courses and ultimately bring more resources to underserved communities.

KCC also had an impact on program mentors' intellectual development and career aspirations. Mentors shared how this experience was "directly" connected to their future and, in some cases, how this experience "changed" their future plans to include working with youth. We know that resources in underserved communities are limited. Therefore, this finding is significant because it gives program directors specific feedback for future goals to encourage university students to become more active members of their respective communities.

The pro-social and pro-community-based outcomes of KCC also had a positive impact on the mentors. For example, mentors highlighted the strong relationships they developed with their mentees and noted increased coaching and leadership abilities. Mentors were engaged in KCC in ways that helped them better understand society and perceive their work as important and purposeful. If university administrators are expected to create bridges between the privileged and the underserved, they may consider incentive-rich programs such as KCC through which students are motivated to participate and develop a sense of civic engagement. In summary, examining mentors' perspectives of the impact of KCC provided valuable program feedback to support the continuation of KCC as a valid career exploration program for high school students. Through programs such as KCC, students can develop the tools and, in this case, the plans for going to college and transitioning into the workforce.

References

- Amis, J. (2005). Interviewing for case study research. In D. Andrews, D. Mason, & M. Silk (Eds.), *Qualitative methods in sports studies* (pp. 104–138). Oxford, England: Berg.
- Balfanz, R., Bridgeland, J. M., Bruce, M., & Hornig-Fox, J. (2012). *Building a grad nation: Progress and challenge in ending the high school dropout epidemic* (A Report by Civic Enterprises Everyone Graduates Center at Johns Hopkins University). Retrieved from http://www.civicerprises.net/MediaLibrary/Docs/Building-A-Grad-Nation-Report-2012_Full_v1.pdf
- Benson, P., & Scales, P. (2004). *Executive summary: Successful young adult development* (A Report by the Social Development Research Group for the Gates Foundation). Seattle: University of Washington.
- Bureau of Labor and Statistics. (2012). College enrollment and work activity of high school graduates [News release]. Retrieved on June 11, 2013, from <http://www.bls.gov/news.release/hsgec.htm>
- Côté, J., Salmela, J. H., Baria, A., & Russell, S. J. (1993) Organizing and interpreting unstructured qualitative data. *The Sport Psychologist*, 7(2), 127–137.
- Eyler, J. S. (2011). What international service learning research can learn from research on service learning. In R. G. Bringle, J. A. Hatcher, & S. G. Jones (Eds.), *International service learning: Conceptual frameworks and research* (pp. 225–242). Sterling, VA: Stylus.
- Hellison, D. (2011). *Teaching personal and social responsibility through physical activity* (3rd ed.). Champaign, IL: Human Kinetics.
- Hellison, D., & Walsh, D. (2002). Responsibility-based youth programs evaluation: Investigating the investigations. *Quest*, 54, 292–307.
- Martinek, T., Schilling, T., & Johnson, D. (2001). Transferring personal and social responsibility of underserved youth to the classroom. *The Urban Review*, 33(1), 29–45.
- McLaughlin, M. W., Irby, M. A., & Langman, J. (1994). *Urban sanctuaries: Neighborhood organizations in the lives and futures of inner city youth*. San Francisco, CA: Jossey-Bass.

- Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation*. San Francisco, CA: Jossey-Bass.
- Oyserman, D., Terry, K., & Bybee, T. (2002). A possible selves intervention to enhance school involvement. *Journal of Adolescence*, 25, 313–326.
- Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage.
- Petipras, A. J., Cornelius, A. E., Van Raalte, J. L., & Jones, T. (2005). A framework for planning youth sport programs that foster psychosocial development. *The Sport Psychologist*, 19, 63–80.
- San Francisco Unified School District. (2013). *School accountability report card, 2012–2013*. Retrieved on October 20, 2013, from www.sfusd.edu/assets/sfusd-staff/rpa/sarcs2/sarc-725.pdf
- Taylor, S., & Bogdan, R. (1984). *Introduction to qualitative research methods: The search for meanings*. New York, NY: John Wiley & Sons.
- Tsoi-A-Fatt, R. (2008). *A collective responsibility, a collective work: Supporting the path to positive life outcomes for youth in economically distressed communities*. Washington, DC: Center for Law and Social Policy.
- Veri, M. J. (2006). Etched impressions: Student writing as engaged pedagogy in the graduate sport management classroom. *Quest*, 58(4), 443–464.
- Veri, M. J., & Walsh, D. (2012). Intersections between sport management and youth development. *Journal of Physical Education and Sports Management*, 3(4), 50–55.
- Walsh, D. (2008). Helping youth in underserved communities envision possible futures: An extension of the teaching personal and social responsibility model. *Research Quarterly in Exercise and Sport*, 79(2), 209–221.
- Walsh, D. (2012). A TPSR-based kinesiology career club for youth in underserved communities. *Agora for Physical Education and Sport*, 14(1), 55–77.
- Walsh, D., Ozaeta, J., & Wright, P. (2010). Transference of responsibility goals to the school environment: Exploring the impact of a coaching club program. *Physical Education and Sport Pedagogy*, 15(1), 15–28.

- Walsh, D. S., Veri, M. J., & Scobie, D. (2012). Impact of the kinesiology career club: A TPSR-based possible futures program for youth in underserved communities. *Agora for Physical Education and Sport*, 14(2), 213–229.
- Whitley, M. A., & Walsh, D. S. (2014). A framework for the design and implementation of service-learning courses. *Journal of Physical Education, Recreation, & Dance*, 85(4), 34–39.
- Wright, P., Li, W., Ding, S., & Pickering, M. (2010). Integrating a personal and social responsibility program into a wellness course for urban high school students: Assessing implementation and education outcomes. *Sport, Education, and Society*, 15(3), 277–298.
- Yin, R. K. (2009). *Case study research: Design and methods* (4th ed.). Los Angeles, CA: Sage.
- Yowell, C. M. (2002). Dreams of the future: The pursuit of education and career possible selves among ninth grade Latino youth. *Applied Developmental Science*, 6(2), 62–72.

PEDAGOGY

Secondary School Students' Physical Activity Participation Across Physical Education Classes: The Expectancy-Value Theory Approach

*Arto Gråstén, Anthony Watt, Martin Hagger,
Timo Jaakkola, Jarmo Liukkonen*

Abstract

The primary purpose of this study was to analyze the link between students' expectancy beliefs, subjective task values, out-of-school activity, and moderate to vigorous physical activity (MVPA) participation across secondary school physical education (PE) classes. The sample comprised 96 students (58 girls, 38 boys; $M_{age} = 15.03$, $SD = .94$) from schools located in Northeast Finland. The self-report questionnaire was modified to address the domain-specific questions for Finnish PE. Accelerometers were used for the objective assessment of students' MVPA across the PE classes and during out-of-school activities. The findings show that perceived importance indicates MVPA involvement for girls and attainment value and out-of-school MVPA for boys. Boys were more physically

Gråstén Arto is a researcher, Department of Sport Sciences, University of Jyväskylä, Finland. Watt Anthony is a senior lecturer, School of Education, Victoria University, Melbourne, Australia. Hagger Martin is a professor, School of Psychology and Speech Pathology, Curtin University, Perth, Western Australia. Jaakkola Timo is a lecturer, Department of Sport Sciences, University of Jyväskylä, Finland. Liukkonen Jarmo is a professor, Department of Sport Sciences, University of Jyväskylä, Finland. Please send author correspondence to Arto Gråstén, University of Jyväskylä, BOX 35(L), 40014 University of Jyväskylä, Finland. E-mail: agrasten@jyu.fi

active than girls across PE classes. In contrast, girls received more out-of-school activity across the 7 days. The major cause of concern arising from the current findings was that girls engaged in up to 26.2% and boys 33.6% of their weekly MVPA during only two 45-min PE classes. A higher priority needs to be placed in schools on encouraging young people to engage in daily physical activity and providing guidance that makes it easy to find activities in which girls and boys have opportunities to be successful and feel competent. Schools should also use PE as a mean to promote greater physical activity outside of school.

Maintaining the positive promotion of physical activity (PA) among children and youth has become a universal challenge (Coulter & Woods, 2011). In previous research, it has been revealed that adolescents' level of moderate to vigorous physical activity (MVPA) declines during adolescence as they transit from childhood into adulthood (Corbin, Pangrazi, & Le Masurier, 2004; World Health Organization, 2008; Yli-Piipari, 2011). This is concerning as less active youth are at greater risk for developing overweight or obesity, type 2 diabetes, or cardiovascular disease, which may impact overall health and quality of life (Haskell et al., 2007). Fortunately, schools are a unique venue where youth can meet the activity recommendations, as the faculty in these institutions are capable of providing PA knowledge and skills to the target population at minimal additional cost to the community (McKenzie, 2007).

Expectancy-value theory is a useful framework for predicting PA behavior (Cox & Whaley, 2004; Gao, Lee, Solmon, & Zhang, 2009; Xiang, McBride, & Bruene, 2006; Yli-Piipari, 2011). The theory addresses whether children desire to participate in an activity and how much effort they are prepared to put into the activity (Eccles et al., 1983; Wigfield & Eccles, 2000). The level of persistence and performance in the activity are determined by their beliefs about how well they will perform the activity (expectancy beliefs) and values they attach to the activity (subjective task values). The approach is highly valuable to envisage the link between students' expectancy-related beliefs and subjective task values to their actual PA performance within physical education (PE) classes, as the beliefs and values have been found to be critical factors in predicting students' performance in school PE (Cox & Whaley, 2004; Gao et al., 2009; Xiang et al., 2006; Yli-Piipari, 2011). In previous research based on expectancy-value theory, PE classes have generally been

considered as potential functions to increase secondary school students' daily PA; however, students' MVPA was not an objectively assessed variable within these studies (Cox & Whaley, 2004; Gao et al., 2009; Xiang et al., 2006; Yli-Piipari, 2011).

Beliefs about ability are defined as individuals' beliefs about their competence in performing or learning achievement tasks, whereas expectancies for success are how individuals view their probability for success at a specific task. Cox and Whaley (2004) reported that 14- to 19-year-old students' expectancy beliefs were positively associated with effort and persistence in basketball. The association between beliefs and intentions to future participation in an elementary PE running program was addressed among 7- to 10-year-old children in Texas (Xiang, McBride, & Bruene, 2006). Similarly, in a longitudinal Finnish study, students' expectancy-related beliefs toward PE decreased across Grades 6 to Grade 9 (Yli-Piipari, 2011).

Another essential element of expectancy-value theory is subjective task values, which are defined as individuals' incentives for doing tasks. Eccles et al. (1983) demonstrated that subjective task values are a function of four distinct components: attainment value (importance), intrinsic value (interest), utility value (usefulness), and cost. Attainment value is the importance to do well on a given task and includes identity issues, as tasks are important when individuals view them as central to their own sense of self and allow them to express or confirm important aspects of self (Eccles et al., 1983). Intrinsic value is the enjoyment a person gains from doing the task. When individuals intrinsically value an activity, they often become deeply engaged in it and can persist at it for a long time (Deci & Ryan, 2000; Eccles et al., 1983). Utility value or usefulness is how a task fits into an individual's future plans, for instance, taking a PE class to fulfill a need for social interaction. Thus, utility value is similar to extrinsic value because when an activity is done out of utility value, the activity is a means to an end rather than an end in itself. Utility value is also connected to personal goals and sense of self and thus has ties to intrinsic motivation (Deci & Ryan, 2000). Cost is what the individual has to give up to do a task, as well as the anticipated effort the person will need to complete the task (Eccles et al., 1983). Cox and Whaley (2004) found that subjective task values, such as beliefs, were positively associated with high school students' effort and persistence in basketball. Particularly, the 1-mile run was more strongly associated with attainment value than intrinsic or utility value in the elementary school running program

study (Xiang et al., 2006). Yli-Piipari (2011) reported that Finnish children aged 11 to 13 years who valued PE highly became more physically active across Grades 6 to 9 based on self-report MVPA scores.

Gender differences have been observed in PE in expectancy beliefs (Xiang et al., 2006; Xiang, McBride, Guan, & Solmon, 2003; Yli-Piipari, 2011) and subjective task values (Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002; Eccles, Wigfield, Harold, & Blumenfeld, 1993; Yli-Piipari, 2011), with boys scoring higher. In contrast, gender differences have not been observed in other studies (Cox & Whaley, 2004; Xiang et al., 2006). Several researchers have suggested that differences may be a result of participation in gender-appropriate activities, when expectancy beliefs increase as a result (Shen, Chen, Tolley, & Scrabis, 2003; Solmon, Lee, Belcher, Harrison, & Wells, 2003). Differences have, therefore, been found more regularly in gender-preferenced activities, such as dance or ice hockey, as girls and boys often tend to value activities that they perceive as appropriate for their gender (Gao & Xiang, 2008). In addition, boys have been found to be more physically active than girls in PE (Flohr, Todd, & Tudor-Locke, 2006) and out of school (Flohr et al., 2006; Tammelin, Laine, & Turpeinen, 2013). Flohr et al. (2006) suggested that MVPA participation could be increased with enhanced opportunities for out-of-school activities in girls and boys.

Previous school-based studies in which self-reports of PA were used have shown these instruments lack measurement precision, and this makes it difficult to assess PA accurately, particularly in relation to PE (Gråstén, Watt, Jaakkola, & Liukkonen, 2012; Riddoch et al., 2004). In a systematic review of school-based randomized controlled trials to promote PA in adolescents, it was revealed that an objective method was used in only one study (direct observation) to assess PE-related levels of PA (Sluijs, McMinn, & Griffin, 2007). Furthermore, only a small number of studies in which accelerometers have been used in PE lessons have been reported (Dudley, Okely, Perason, & Cotton, 2011; Lonsdale, Sabiston, Raedeke, Ha, & Sum, 2009). This introduces the potential for substantial methodological variation to be introduced in PA levels in PE reported in the literature. The present study is the first attempt to examine associations of objectively measured MVPA scores and expectancy beliefs and subjective task values across PE classes in a sample of secondary school students.

The primary purpose of this study was to analyze the link between Finnish secondary students' expectancy beliefs, subjective task values, and out-of-school MVPA and their actual MVPA participation across two 45-min PE classes. On basis of the framework, it was hypothesized that expectancy beliefs and subjective task values, especially attainment value (Xiang et al., 2006; Yli-Piipari, 2011) and out-of-school activity (Stodden et al., 2008), would play a positive role in students' MVPA level during PE classes when using accelerometer scores. The second purpose of this study was to investigate associated gender differences. Based on previous studies, it was assumed that boys would report higher scores in expectancy beliefs and attainment, intrinsic, and utility values (Eccles et al., 1993; Jacobs et al., 2002; Xiang et al., 2006; Xiang et al., 2003; Yli-Piipari, 2011) and also demonstrate greater MVPA in PE and out-of-school MVPA (Tammelin et al., 2013; Yli-Piipari, 2011). In addition, a structure of the measurement model of expectancy beliefs and subjective task values was tested.

Methods

Participants

Participants were recruited from secondary schools located in Northeast Finland through direct contact with the school principals. Students in each PE class were invited to participate. The sample comprised 96 students (58 girls, 38 boys) aged 12 to 16 years ($M = 15.03$, $SD = .94$). The human participants' approval statement was obtained from the ethics committee of the local university, and consent to participate in the study was obtained from participants and their parents. Participation in this study was voluntary, and no extra credit was awarded for participation.

Instruments

Beliefs about ability, expectancies for success, and subjective task values. The self-report questionnaire, originally developed by Eccles et al. (1983), was modified to address the domain-specific questions for Finnish PE (Yli-Piipari, 2011). Beliefs about ability and expectancies for success were used as a combination, similar to the one used by Xiang et al. (2003). For the purpose of this study, the attainment, intrinsic, and utility value dimensions of subjective task values were measured. The introduction preceding the items was, "When you think about your school physical education classes."

Responses were given on 5-point Likert-scales anchored by *totally disagree* (1) and *totally agree* (5). Xiang et al. (2003) demonstrated acceptable validity and reliability scores using these self-reports with elementary school children in PE.

Objective MVPA. Accelerometers were used for the objective assessment of students' MVPA in PE classes, recess, and out of school. Specifically, Polar activity monitors were chosen to investigate the patterns of MVPA in PE on a minute-by-minute basis (Polar Electro, 2011). The monitors are light, small, and worn on the wrist. The electronic monitors detected the intensity of the movements at 10-s intervals and displayed minutes spent in the moderate to vigorous activity zone. For the purpose of this study the manufacturer's protocols were followed to determine MET minutes as the representation of MVPA including two 45-min PE classes, and out-of-school activity (recess and leisure time) across 7 days. The Polar monitors have been validated in children and adolescents (Virtanen, 2011). A validation study conducted in a sample of Finnish 6- to 15-year-old children and adolescents ($n = 20$), revealed MET values for playing games, walking, and running had a high correlation with MET values from indirect calorimetry ($r = .91$), whereas the correlation was low for sitting activities ($r = .31$; Virtanen, 2011). In another study, the correlation between monitors and indirect calorimetry ($r = .86$) was similar to the correlation between Actigraph accelerometers and indirect calorimetry ($r = .84$) for seven activities (sitting quietly, seated playing a video game, a standing warm-up, walking, jumping rope, video-led kickboxing, and running for 30 min in a sample of 23 Finnish 11- to 17-year-old children and adolescents (Virtanen, 2011).

Procedure

The current data are part of a larger 4-year research project aimed at promoting PA and health among children and youth. The researchers collected the self-reports during the school's allotted 45-min lessons in April 2011. Girls and boys were taught in gender groups by one female and two male teachers. The participants were told that their involvement was voluntary, and the scores were kept confidential. In addition, the participants were encouraged to ask for help if they did not understand the instructions or the clarity of a particular item. To minimize students' tendency to give socially desirable responses, students were encouraged to answer honestly and were assured that their responses were confidential. Objectively

measured MVPA data were collected for 7 days, including two 45-min PE classes for each student. The MET minutes of the two lessons were calculated and used as the students' MVPA in PE scores. The activities (warm-up: gymnastics, ball games: volleyball, badminton, and floor hockey) represent the essential contents of Finnish PE classes from Grades 5 to 9 (Finnish National Board of Education, 2004). Girls and boys had similar classes at each grade. Consequently, MVPA comparisons between grades were not appropriate. Out-of-school MVPA was obtained by subtracting PE class activity out of total MVPA. The researchers gave instructions on how to use the activity monitors at the beginning of the lessons. The researchers entered the students' demographic details to calibrate the monitors (age, gender, height, and weight). The PE teachers collected the monitors, and the researchers downloaded the data to a computer. Only students who received complete data for 7 days were entered into the data analyses.

Data Analysis

The data were analyzed in several steps. Prior to statistical analyses, the distribution, missing values, and outliers of the data were examined. The variables were approximately normally distributed, and no missing values or outliers were found using the standardized values (± 3.29) and Mahalanobis distance ($p < .001$) procedures (Tabachnick & Fidell, 2007). A confirmatory factor analysis (CFA) was conducted on 11 items measuring expectancy beliefs and subjective task values to examine the four-factor structure of the measure scores. The data were entered as a covariance matrix, and the analysis was performed using the MPlus version 6.12 software with a maximum likelihood estimation procedure. To determine the goodness of fit of the proposed model with the data, the model chi-square value (χ^2), chi-square degrees of freedom, the comparative fit index (CFI), the Tucker-Lewis index (TLI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR) indices were used. The associations of expectancy beliefs, subjective task values, and objectively measured MVPA were examined using correlation matrix and logistic regression analysis. MANOVA was used to study gender differences in expectancy beliefs, subjective task values, MVPA in PE classes, and out-of-school MVPA. For logistic regression analysis, the manufacturer's activity levels for the classification of MVPA scores were used (Polar Electro, 2011). Students' performance was considered

physically active if they engaged in more than 600 MET min of activity over two 45-min lessons. Those who engaged in fewer than 600 MET min were categorized as physically inactive. Stepwise logistic regression analysis was completed using SPSS 19.0 software.

Results

Confirmatory Factor Analysis

A four-factor model of expectancy-value theory was tested following procedures outlined by Xiang et al. (2003). The resulting CFA model did not yield an acceptable fit for the data based on the selected fit indices, $\chi^2(38) = 85.367$, $p < .001$, CFI = .93, TLI = .89, RMSEA = .114, SRMR = .045. The next step was to modify the factor model for secondary school adolescents using a theory-based rationale. The measurement errors of items “How good are you in PE classes?”, “Compared to other students, how good are you in PE classes?”, “How well do you expect to learn new skills in PE classes next year?”, and “How well do you expect to do in PE classes next year?” were allowed to correlate because some of the shared variance in the indicators was due to the latent factor or an outside cause. In the final CFA (Figure 1), a good fit was revealed for the modified model, $\chi^2(36) = 53.938$, $p < .05$, CFI = .97, TLI = .96, RMSEA = .072, SRMR = .035. In addition, composite reliability for the factor loadings for the expectancy beliefs (.92), attainment value (.97), intrinsic value (.96), and utility value (.99) factors indicated satisfactory internal consistency. Based on the results of the final CFA, we concluded that the measures of expectancy beliefs and subjective task values demonstrated adequate reliability and validity. A summary of intercorrelations, means, standard deviations, and Cronbach’s alpha coefficients for all factors based on the CFA are presented in Table 1.

Gender differences

The values of skewness ranged from $-.86$ to $.35$, indicating that the variables were approximately normally distributed. In contrast, the Box M test revealed a violation of the assumption of homogeneity of covariance matrices for intrinsic value ($F = 4.70$, $p < .05$) and PA in PE lessons ($F = 20.19$, $p < .05$). When the within-group covariance matrices were not equal, Pillai’s trace criterion, $F(5, 90) = 4.06$, $p < .05$, Pillai’s $tr = .184$, partial $\chi^2 = .18$, was used to detect significant gender differences (Anderson, 2003). Based on the

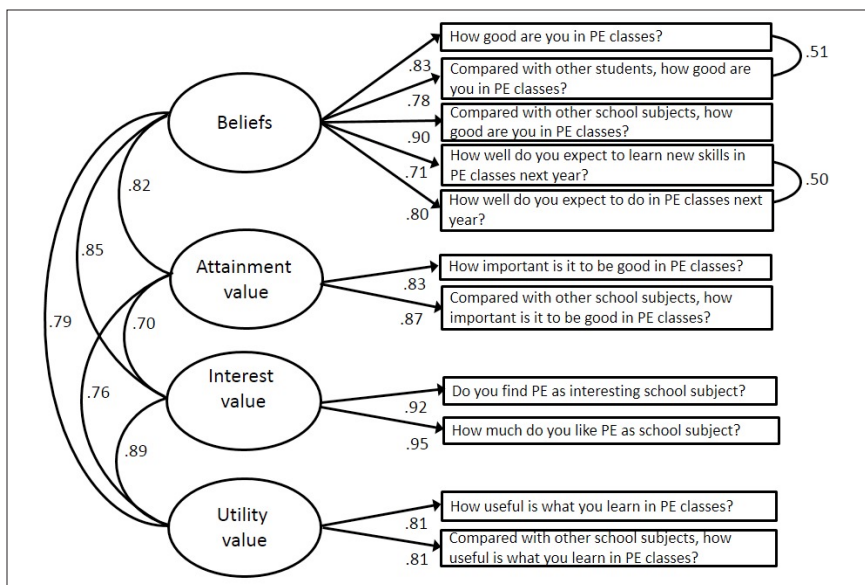


Figure 1. Measurement model (CFA) of the four-factor structure of expectancy beliefs and subjective task values.

MANOVA, statistically significant differences were found between girls and boys on expectancy beliefs, $F(1, 5) = 8.09, p < .01$; attainment value, $F(1, 8) = 7.38, p < .01$; intrinsic value, $F(1, 14) = 12.78, p < .001$; utility value, $F(1, 6) = 7.71, p < .01$; MVPA in PE classes, $F(1, 653135) = 11.94, p < .001$; and out-of-school MVPA, $F(1, 455773) = 4.04, p < .05$).

Logistic Regression Analysis

The results of the stepwise logistic regression analysis are shown in Table 2. Results indicated that MVPA participation in girls' PE lessons was predicted by attainment value ($R^2 = .22, B = .76, OR = 2.13, p < .05$), and in boys' lessons by attainment value ($R^2 = .24, B = 1.15, OR = 3.14, p < .05$) and out-of-school MVPA ($R^2 = .21, B = -.00, OR = 1.00, p < .05$). The model fit resulted in a 74.1% correct overall prediction for active or inactive girls in PE lessons and 70.4% for MVPA participation. In an equal analysis of boys, an 84.2% correct overall prediction and 92.6% for MVPA participation was revealed. Taken together, stepwise logistic regression analysis showed that MVPA in PE lessons was affected by attainment value (importance) in girls' classes and attainment value and out-of-school MVPA in boys' classes. Neither expectancy beliefs, utility value, nor intrinsic value entered into the equation.

Table 1

Summary of Intercorrelations, Means, Standard Deviations, and Cronbach's Alpha Coefficients for All Variables

Variable list	1	2	3	4	5	6	M	SD	α	Grand M
1. Expectancy beliefs	–	.493**	.706***	.612***	-.013	.144	3.61	.82	.91	3.85
2. Attainment value	.896***	–	.554***	.560***	.195	.050	3.22	1.05	.79	3.45
3. Interest value	.758***	.688***	–	.736***	.104	.250	3.66	1.18	.92	3.97
4. Utility value	.632***	.656***	.765***	–	.147	.152	3.65	.93	.79	3.85
5. MVPA ^a	.185	.310	.317	.322*	–	-.126	567.61	161.37	–	651.95
6. MVPA ^b	.041	.055	-.047	-.066	-.551***	–	1,595.60	306.68	–	1,525.16
<i>M</i>	4.14	3.80	4.45	4.16	736.28	1454.71				
<i>SD</i>	.80	1.02	.85	.80	314.37	376.26				
α	.92	.88	.93	.74	–	–				

Note. Intercorrelations for girls ($n = 58$) are presented above the diagonal, and intercorrelations for boys ($n = 38$) are presented below the diagonal. Means, standard deviations, and Cronbach's alphas for girls are presented in vertical columns, and means, deviations, and Cronbach's alphas for boys are presented in horizontal columns. Grand mean of the target sample ($n = 96$) is presented in the last vertical column on right.

^aTotal MVPA in physical education classes (MET minutes). ^bTotal out-of-school MVPA (MET minutes).

* $p < .05$. *** $p < .001$.

Table 2
Logistic Regression Analysis Results (N = 96, df = 1)

	<i>R</i> ²	<i>B</i>	Exp (<i>B</i>)	<i>SE</i>	Wald	<i>p</i>
Girls (<i>n</i> = 58)						
Constant		.65	1.92	1.75	.14	.710
Attainment value	.22	.76	2.13	.30	6.24	.012*
Boys (<i>n</i> = 38)						
Constant		2.92	18.45	2.79	1.09	.296
Attainment value	.24	1.15	3.14	.50	5.35	.021*
MVPA ^a	.21	-.00	1.00	.00	5.84	.016*

^aOut of school.

**p* < .05.

Discussion

The primary purpose of this study was to analyze the link between students’ expectancy beliefs, subjective task values, out-of-school activity, and MVPA participation across Finnish secondary school PE classes. The findings indicate that expectancy beliefs are not a strong factor for MVPA participation in PE classes, whereas importance is a factor for MVPA involvement for girls and attainment value and out-of-school MVPA for boys. Students reported that PE was an important, interesting, and useful school subject, with boys scoring higher than girls. Finally, boys were more physically active than girls across PE classes; MET minutes based on the accelerometer scores showed that intensity of activities ranged from moderate to vigorous. In contrast, girls received more out-of-school MVPA across 7 days.

The results show that the associations between expectancy beliefs and MVPA participation, as well as subjective task values and MVPA participation, are comparatively weak, ranging from negligible to low. This was the first attempt to examine the associations with the accelerometer scores in a sample of Finnish secondary school students. Previous studies from other countries in which objective measure scores were used were not found. The current findings are unexpected as expectancy-related beliefs and values have been found to be crucial factors in predicting individuals’ performance in school PE (Cox & Whaley, 2004; Gao et al., 2009; Xiang et al., 2006). A plausible reason for the inconsistent associations may

be that two objectively measured 45-min periods for each student was contextually limited. In earlier studies, performance was analyzed using more extensive questionnaires (Yli-Piipari, 2011) or via a timed 1-mile run (Xiang et al., 2006). Yli-Piipari (2011) investigated total PA using the protocol of the World Health Organization (2004, 2008), measuring self-reported MVPA across 7 days, including PE and leisure activity. In the running-program study, PE performance was measured using the structured test run, in which the children were encouraged to run as fast as they were able (Xiang et al., 2006). The MVPA scores of the current study were derived only from PE class activity, and students performed without additional stimulation. Additionally, Gråstén et al. (2012) suggested that different MVPA measurement methods can result in a full range of outcomes, which may also have an impact on the differences in these studies based on the expectancy-value theory. The association of beliefs and values with objective outcomes such as MVPA in PE classes may require a longer period of assessment or several measurement techniques to be fully elucidated. Health and well-being-related beliefs or values may also be sensitive with respondents reluctant to provide exact details (Brener, Billy, & Grady, 2003). In addition, the level of performance in the activity is determined by students' beliefs about how well they will perform the activity and the values they attach to the activity (Eccles et al., 1983; Wigfield & Eccles, 2000). Hence, two 45-min classes for each student may be too contextual for self-evaluation such as an activity experience to internalize beliefs about their personal MVPA levels, when beliefs and values were not assessed immediately after PE class but in the same week.

The associations between expectancy beliefs and subjective task values ranged from moderate to high. The present finding is similar to previous studies concerning PE in secondary school and middle school students (Gao et al., 2009; Yli-Piipari, 2011). The results indicate that students who score higher on expectancy-related beliefs in PE classes tend to see it as more useful, important, and interesting than students who score lower on expectancy beliefs. In other words, if students do well and believe they are competent on the tasks, they view PE classes as more useful, important, and interesting (Gao et al., 2009).

Both physically active girls and boys valued PE classes as more important than inactive students did, who valued classes as less important. The current finding is similar to other studies. For example,

Xiang et al. (2006) found that attainment value was more strongly associated with 1-mile run performance than intrinsic or utility value in an elementary school running program. Unexpectedly, in the present study, neither expectancy beliefs, intrinsic value, nor utility value was significant when entered into the logistic regression equation for secondary school students. The latter finding may be a consequence of a decrease in expectancy beliefs or relatively stable subjective task values across the secondary school years (Yli-Piipari, 2011). The outcomes of these studies are not equal; consequently, the corresponding conclusions are restricted on the basis of the findings without additional information. The differences indicate a possibility that expectancy beliefs and subjective task values for MVPA in certain PE classes are different to those that activate students in structured PE programs or overall PA across the secondary school years. In addition, out-of-school activities related with boys' MVPA participation in PE classes. This finding is not unexpected, as Flohr et al. (2006) suggested that MVPA participation could be increased by providing enhanced opportunities for out-of-school activities. Additionally, PE should be used in schools as a means to promote greater PA outside of school (Hagger et al., 2009).

As assumed, expectancy beliefs, subjective task values, especially interest value, are higher for boys. This pattern is in line with previous findings, in which more physically active students scored higher than less active students on expectancy beliefs (Xiang et al., 2006; Xiang et al., 2003; Yli-Piipari, 2011) and subjective task values in PE (Eccles et al., 1993; Jacobs et al., 2002; Yli-Piipari, 2011). Gender differences in expectancy beliefs and subjective task values may have been the result of participation in gender-appropriate activities, whereby expectancy beliefs and values increase as a result (Shen et al., 2003; Solmon et al., 2003). In the present study, the activities undertaken in PE classes such as volleyball, badminton, and floor hockey may have been more appropriate for boys. According to a recent Finnish study (Finnish Sports Federation, 2010), 13- to 18-year-old girls were most likely to participate in gymnastics and dance classes, whereas boys tended to prefer ball games (i.e., soccer, ice or floor hockey), which require relatively high ball handling skills. Stodden et al. (2008) suggested that competency increased the likelihood of participating in physical activities. Therefore, it is not surprising that boys scored higher on the belief and value variables, as girls and boys tend to value activities that they perceive as gender oriented or specific (Gao & Xiang, 2008).

Additionally, boys engaged in more MVPA in PE classes than girls did. This particular result is consistent with earlier findings based on pedometers used to detect overall MVPA in school PE (Flohr et al., 2006). In contrast, girls were involved in more out-of-school MVPA than boys. Tammelin et al. (2013) found that Finnish secondary school-aged boys achieved more out-of-school PA than girls did when using self-reports. Furthermore, Trost et al. (2002) highlighted that for overall MVPA, the magnitudes of the gender differences were small when measured objectively with accelerometers. Despite the gender differences, the major cause of concern arising from the current findings is that girls engaged in up to 26.2% and boys 33.6% of their weekly MVPA during only two 45-min PE classes. When out-of-school activity was transformed for total minutes using manufacturer's procedure (5 MET) as the lower limit for MVPA, each student on average engaged in daily out-of-school MVPA for only 44 min. This finding is a concern, especially among the most inactive students. We found no other studies that have used a similar procedure to that used in the current study to measure MVPA. Therefore, the current results show important preliminary insights into the secondary school students' MVPA participation across PE classes and during out-of-school activities.

A key strength of this study was the use of objective means to measure MVPA. Through the use of accelerometers, unique information was found about the associations of expectancy beliefs and subjective task values to secondary school students' actual MVPA across PE classes. The scores were of activity levels in conventional PE lessons without confounding factors, which may have had a significant effect on scores, for example, to exercise motivation. In contrast, the present study was cross-sectional and correlational, and therefore, the associations identified should not be interpreted as cause-effect relationships (Hagger & Chatzisarantis, 2009). Furthermore, the sample size was relatively small due to economic and practical implementation reasons. It was also not possible to measure seasonal variations in activity patterns. There were also limitations in objective measures that should be acknowledged such as that a single technique may not detect the full range of dimensions of PA such as frequency, type, intensity, or duration (Dale, Welk, & Matthews, 2002).

Recent evidence from the World Health Organization (2011) reinforces the strong link between physical activities and continuing positive benefits to health, well-being, and weight control among

elementary school children and secondary school students. School PE classes are a unique venue for students to receive moderate to vigorous activity levels to achieve the health-related benefits (McKenzie et al., 2004). The more efficient use of PE time for PA could be a modest contribution to meeting activity guidelines and helping control the epidemic of overweight and obesity in youth (McKenzie et al., 2004). In the current findings, a particular challenge to educational professionals in secondary schools is to ensure that all students receive opportunities to do well and believe they are competent on the activities (Wigfield & Eccles, 2000; Wigfield, Eccles, Schiefele, Roeser, & Davis-Kean, 2006; Wigfield, Tonks, & Klauda, 2009). The outcomes of this study support the notion that the more value and importance that students attach to PE classes, the more MVPA they would engage in across 45-min classes and in out-of-school activity. Young people clearly cannot be provided with all the PA they need in secondary PE classes alone (McKenzie et al., 2004). In schools, a higher priority needs to be placed on encouraging young people to engage in daily PA and to providing guidance that makes it easy to find activities in which girls and boys have opportunities to be successful and feel competent.

References

- Anderson, T. (2003). *An introduction to multivariate statistical analysis*. New York, NY: Wiley.
- Brener, N., Billy, J., & Grady, W. (2003). Assessment of factors affecting the validity of self-reported health-risk behavior among adolescents: Evidence from the scientific literature. *Journal of Adolescent Health, 33*(6), 436–457. doi:10.1016/S1054-139X(03)00052-1
- Corbin, C., Pangrazi, R., & Le Masurier, G. (2004). Physical activity for children: Current patterns and guidelines. *The President's Council of Physical Fitness and Sports Research Digest, 5*(2), 1–8.
- Coulter, M., & Woods, C. (2011). An exploration of children's perceptions and enjoyment of school-based physical activity and physical education. *Journal of Physical Activity & Health, 8*(5), 645–654.
- Cox, A., & Whaley, D. (2004). The influence of task value, expectancies for success, and identity on athletes' achievement behaviors. *Journal of Applied Sport Psychology, 16*(2), 103–117. doi:10.1080/10413200490437930

- Dale, D., Welk, G., & Matthews, C. (2002). Methods for assessing physical activity and challenges for research. In G. Welk (Ed.), *Physical activity assessments for health-related research* (pp. 19–34). Champaign, IL: Human Kinetics.
- Deci, E., & Ryan, R. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268. doi:10.1207/S15327965PLI1104_01
- Dudley, D., Okely, A., Perason, P., & Cotton, W. (2011). A systematic review of the effectiveness of physical education and school sport interventions targeting physical activity, movement skills and enjoyment of physical activity. *European Physical Education Review*, 17(3), 353–378. doi:10.1177/1356336X11416734
- Eccles, J., Adler, T., Futterman, R., Goff, S., Kaczala, C., Meece, J., & Midgley, C. (1983). Expectancies, values and academic behaviours. In J. T. Spence (Ed.), *Achievement and achievement motivation* (pp. 75–146). San Francisco, CA: W. H. Freeman.
- Eccles, J., Wigfield, A., Harold, R., & Blumenfeld, P. (1993). Age and gender differences in children’s self- and task perceptions during elementary school. *Child Development*, 64(3), 830–847. doi:10.2307/1131221
- Finnish National Board of Education. (2004). *National core curriculum for basic education 2004*. Vammala, Finland: Vammalan Kirjapaino Oy.
- Finnish Sports Federation. (2010). *National survey of sport and exercise 2009–2010*. Retrieved January 15, 2013, from <http://slu-fi-bin.directo.fi>
- Flohr, J., Todd, K., & Tudor-Locke, C. (2006). Pedometer assessed physical activity in young adolescents. *Research Quarterly for Exercise & Sport*, 77(3), 309–315. doi:10.1080/02701367.2006.10599365
- Gao, Z., Lee, A., Solmon, M., & Zhang, T. (2009). Changes in middle school students’ motivation toward physical education over one school year. *Journal of Teaching in Physical Education*, 28(4), 378–399.
- Gao, Z., & Xiang, P. (2008). College students’ motivation toward weight training: An application of expectancy-value model. *Journal of Teaching in Physical Education*, 27(3), 399–415.

- Gråstén, A., Watt, A., Jaakkola, T., & Liukkonen, J. (2012). Directly measured and self-reported physical activity in a sample of Finnish secondary school students. *Advances in Physical Education*, 2(3), 132–138. doi:10.4236/ape.2012.23023
- Hagger, M., & Chatzisarantis, N. (2009). Assumptions in research in sport and exercise psychology. *Psychology of Sport & Exercise*, 10(5), 511–519. doi:10.1016/j.psychsport.2009.01.004
- Hagger, M., Chatzisarantis, N., Hein, V., Pihu, M., Soós, I., Karsai, I., & Leemans, S. (2009). Teacher, peer, and parent autonomy support in physical education and leisure-time physical activity: A trans-contextual model of motivation in four cultures. *Psychology & Health*, 24(6), 689–711. doi:10.1080/08870440801956192
- Haskell, W., Lee, I. M., Pate, R., Powell, K., Blair, S., Franklin, B., ... Bauman, A. (2007). Updated recommendation for adults from the American College of Sports Medicine and the American Heart Association. *Medicine & Science in Sports & Exercise*, 39(8), 1423–1434. doi:10.1249/mss.0b013e3180616b27
- Jacobs, J., Lanza, S., Osgood, W., Eccles, J., & Wigfield, A. (2002). Changes in children's self-competence and values: Gender and domain differences across grade one through twelve. *Child Development*, 73(2), 509–527. doi:10.1111/1467-8624.00421
- Lonsdale, C., Sabiston, C., Raedeke, T., Ha, A., & Sum, R. (2009). Self-determined motivation and students' physical activity during structured physical education lessons and free choice periods. *Preventive Medicine*, 48(1), 69–73. doi:10.1016/j.ypmed.2008.09.013
- McKenzie, T. (2007). The preparation of physical educators: A public health perspective. *Quest*, 59(4), 345–357. doi:10.1080/00336297.2007.10483557
- McKenzie, T., Sallis, J., Prochaska, J., Conway, T., Marshall, S., & Rosengard, P. (2004). Evaluation of a two-year middle-school physical education intervention: M-SPAN. *Medicine & Science in Sports & Exercise*, 36(8), 1382–1388. doi:10.1249/01.MSS.0000135792.20358.4D
- Polar Electro. (2011). Polar Active activity monitor. Retrieved November 10, 2011, from http://www.polar.fi/fi/b2b_tuotteet/liikuntakasvatus/aktiivisuudenmittaus/polar_active

- Riddoch, C., Andersen, L., Wedderkopp, N., Harro, M., Klasson-Heggebø, L., Sardinha, L., . . . Ekelund, U. (2004). Physical activity levels and patterns of 9- and 15-yr-old European children. *Medicine & Science in Sport & Exercise*, 36(1), 86–92. doi:10.1249/01.MSS.0000106174.43932.92
- Shen, B., Chen, A., Tolley, H., & Scrabis, K. (2003). Gender and interest-based motivation in learning dance. *Journal of Teaching in Physical Education*, 22(4), 396–409.
- Sluijs van, E., McMinn, A., & Griffin, S. (2007). Effectiveness of interventions to promote physical activity in children and adolescents: Systematic review of controlled trials. *British Medical Journal*, 335(7622). doi:10.1136/bmj.39320.843947.BE
- Solmon, M., Lee, A., Belcher, D., Harrison, L., & Wells, L. (2003). Beliefs about gender appropriateness, ability, and competence in physical activity. *Journal of Teaching in Physical Education*, 22(3), 261–279.
- Stodden, D., Goodway, J., Langendorfer, S., Robertson, M., Rudisill, M., Garcia, C., & Garcia, L. (2008). A developmental perspective on the role of motor skill competence in physical activity: An emergent relationship. *Quest*, 60(2), 290–306. doi:10.1080/00336297.2008.10483582
- Tabachnick, B., & Fidell, L. (2007). *Using multivariate statistics*. Boston, MA: Allyn & Bacon.
- Tammelin, T., Laine, K., & Turpeinen, S. (2013). Physical activity of school-aged children. In T. Tammelin, K. Laine, & S. Turpeinen (Eds.), *Research reports on sport and health* 272 (pp. 41–69). Jyväskylä, Finland: LIKES Foundation for Sport and Health Sciences.
- Trost, S., Pate, R., Sallis, J., Freedson, P., Taylor, W., Dowda, M., & Sirard, J. (2002). Age and gender differences in objectively measured physical activity in youth. *Medicine & Science in Sports & Exercise*, 34(2), 350–355. doi:10.1097/00005768-200202000-00025
- Virtanen, P. (2011, April). Measurement of children's physical activity. Development of Polar Active activity monitor. *Proceedings from the International Congress on Enhancement of Physical Activity of Children and Youth* (pp. 33–34). Vuokatti, Finland.

- Wigfield, A., & Eccles, J. (2000). Expectancy-value theory of achievement motivation. *Contemporary Educational Psychology*, 25(1), 68–81. doi:10.1006/ceps.1999.1015
- Wigfield, A., Eccles, J., Schiefele, U., Roeser, R., & Davis-Kean, P. (2006). Development of achievement motivation. In W. Damon & N. Eisenberg (Eds.), *Handbook of child psychology* (pp. 933–1002). New York, NY: Wiley.
- Wigfield, A., Tonks, S., & Klauda, S. (2009). Expectancy-value theory. In K. Wentzel & A. Wigfield (Eds.), *Handbook of motivation at school* (pp. 55–76). Mahwah, NJ: Lawrence Erlbaum Associates.
- World Health Organization. (2004). *Health behaviour in school-aged children: HBSC International report from the 2001/2002 survey*. Retrieved March 5, 2012, from <http://www.hbsc.org/>
- World Health Organization. (2008). *Inequalities in young people's health: HBSC International report from the 2005/2006 survey*. Retrieved October 20, 2012, from <http://www.childhealthresearch.eu>
- World Health Organization. (2011). Recommended levels of physical activity for children aged 5–17 years. Retrieved September 21, 2012, from http://www.who.int/dietphysicalactivity/factsheet_young_people/en
- Xiang, P., McBride, R., & Bruene, A. (2006). Fourth graders' motivational changes in an elementary physical education running program. *Research Quarterly for Exercise & Sport*, 77(2), 195–207.
- Xiang, P., McBride, R., Guan, J., & Solmon, M. (2003). Children's motivation in elementary physical education: An expectancy-value model of achievement choice. *Research Quarterly for Sport & Exercise*, 74(1), 25–35. doi:10.1080/02701367.2003.10609061
- Yli-Piipari, S. (2011). *The development of students' physical education motivation and physical activity: A 3.5-year longitudinal study across Grades 6 to 9* (Doctoral dissertation, University of Jyväskylä, Jyväskylä, Finland).

Instructions for Authors

The Physical Educator

Author manuscripts must be submitted online (<http://js.sagamorepub.com/pe/information/authors>) and meet the following guidelines:

Manuscripts must be double spaced in Times New Roman 12-point font in a Microsoft Office Word document. Number the lines of the manuscript, including the references. Manuscripts should be 25 pages or fewer in length, including charts, graphs, graphics, pictures, and tables. Please follow APA 6th edition style guidelines consistently throughout the manuscript.

The first page of the manuscript must include the title of the article only. Do not include your name, affiliation, or other identifying information. An abstract must accompany each manuscript.

Label all charts, graphs, and tables and place them on separate pages. Submit all images 300 dpi with appropriate captions. Number the pages beginning with the title page followed by text, references, figure captions, tables, and figures. Figures must be clean and legible. Freehand art or lettering is not acceptable.

Carefully check references to ensure they are correct, included only when they are cited in the text using APA 6th edition style guidelines. Only include references that have been published or accepted for publication.

Upon submission, authors will be sent an e-mail of receipt. Manuscripts are read by the editor and three reviewers using a blind review process that takes up to 90 days. Authors will be notified about the disposition of their manuscripts as soon as reviewers have returned their reviews. Depending on the outcome of the review, authors will receive one of the following notices:

1. An e-mail of acceptance certifying the article will be published in the near future.
2. An e-mail of rejection and copies of reviewers' comments.
3. An e-mail recommending revision and copies of reviewers' comments and suggested revisions. A due date will be listed for resubmission of the revised manuscript.

Galley proofs will be e-mailed to the lead author and must be returned within 72 hours of receipt. Only minor corrections may be made at this point. New additions or major revisions are not allowed. Reprints of articles are not available at this time. The lead author will receive an electronic copy of the issue that is to be distributed to coauthors only.

