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METHODOLOGY

Heart Rate Profiles of Children With and Without Autism Spectrum Disorder in Response to Physical Play: A Preliminary Investigation

Casey M. Breslin, Mary E. Rudisill, Danielle D. Wadsworth

Abstract

In this study, the heart rate response of children with and without autism spectrum disorder (ASD) exposed to outdoor free play sessions during preschool was examined. Participants (n = 7; four children with ASD and three children who show typical development) wore Actiheart heart rate monitors during 6 school days. Using a single-subject design, the researchers found that children with and without ASD demonstrated a similar heart rate response to an outdoor free play period and similar participation as measured using PAHR-25 and PAHR-50 indexes. These children did not engage in adequate amounts of moderate to vigorous physical activity during free play. Thus, interventions should be developed to determine best practices for children with and without ASD to participate in adequate amounts of moderate to vigorous physical activity during free play.

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Due the behavioral characteristics of autism spectrum disorder (ASD), children with ASD may be particularly at risk for being inappropriately engaged during unplanned free play, a common form of motor and physical activity (PA) programming for preschool-aged children. Free play is a high autonomy, child-driven opportunity for physical play in which no formal instructions, goals, or objectives are in place for the children to meet (Goodway & Branta, 2003; Robinson & Goodway, 2009). Researchers have suggested that preschoolers do not meet recommended PA guidelines during these types of play (Brown, Googe, McIver, & Rathel, 2009; McWilliams et al., 2009), yet this type of programming is pervasive in preschools.

Children with ASD, when left alone, without direct instruction regarding how to engage in appropriate physical play, are likely to behave inappropriately by withdrawing from their environment or exhibiting developmentally immature behaviors (Sherrill, 1998). Therefore, for children with ASD, unplanned free play may be spent engaging in sedentary, or otherwise inappropriate, behaviors (Pan, 2008a; Rosser Sandt & Frey, 2005). There are concerns that young children with ASD do not appropriately engage in PA during free play due to deficits in their communication and social interaction ability (Kangas, Maatta, & Uusiautti, 2012). Since children with ASD are at risk in free play settings, it is important to gain a better understanding of PA participation of children with ASD so appropriate educational experiences can be developed and implemented.

The results in recent research about the levels of PA participation by children with ASD have been inconsistent. Some researchers have found that children with ASD, when provided opportunities for PA, participate in less and lower intensity PA than their peers who show typical development (Pan, 2008a, 2008b). Other researchers have found that children with ASD participate in similar levels of PA as their peers who show typical development during recess, physical education (PE), and after-school activities (Bandini et al., 2013; Rosser Sandt & Frey, 2005). Specifically, Pan (2008a) examined the PA levels of Taiwanese children between ages 7 and 12 years in an inclusive recess setting, during which the children wore accelerometers. The researcher found that the children without ASD participated in an average of 7 more minutes of moderate to vigorous PA (MVPA) than their peers with ASD. The difference in recess time spent in MVPA between children with ASD (27.70% of recess time) and children without ASD (36.15% of recess time) was nearly 9%.

The PA levels Taiwanese children with and without ASD attained in PE settings were compared to those attained in recess settings (Pan, 2008b). These results indicate that MVPA participation levels are similar in PE settings. However, in recess settings, children with ASD engage in less MVPA than their peers who show typical development (Pan, 2008b). Rosser Sandt and Frey (2005), who also used accelerometers in their study, found the PA levels of American children with ASD between ages 5 and 12 years during PE, recess, and after-school hours were similar to those of their peers who show typical development. Children with ASD were found to participate in slightly less, albeit not significantly different, levels of MVPA at all time (i.e., all day totals, PE, recess, and after school) during data collection than their peers without ASD. Finally, Bandini et al. (2013), using accelerometry and parent report data to examine the PA habits of children with and without ASD, found that children without ASD participated in higher quantities of moderate PA during the week. In addition, they found no significant difference in PA levels between children with and without ASD for the week. The participants with ASD in all of these studies were of school age, and researchers have not compared PA levels of children with ASD enrolled in preschool to levels of their peers who show typical development. Additionally, heart rate monitoring has not been used in any studies to report PA levels of children with ASD; however, this technology has been used to measure the impact of self-injurious behaviors, stereotypes, and restraint devices on heart rate with children with ASD (Jennett, Hagopiana, & Beaulieu, 2011; Lydon, Healy, & Dwyer, 2013) and to measure cardiovascular arousal during brain imaging studies (Ming, Julu, Brimacombe, Connor, & Daniels, 2005).

In these previous studies, the PA engagement of children with ASD was explored using group statistical designs. This design, although popular in PE and kinesiology research, is useful for examining group effects, but not individual differences (Forbes et al., 2011). However, single-subject designs are used in the special education literature because the individual is a unit of analysis and researchers may include a smaller numbers of participants (Cakiroglu, 2012). In spite of the widespread use of single-subject designs in special education research, no researchers have used a single-subject design to report the heart rate response (and PA levels) of children with and without ASD.

Therefore, the purpose of this preliminary investigation was to determine the heart rate response and PA levels of children with

and without ASD enrolled in preschool in response to a free play PE experience using a single-subject design. Heart rate monitors are objective and reliable tools for measuring PA in young children (Benham-Deal, 2005; Brage, Brage, Franks, Ekelund, & Wareham, 2005; Durant et al., 1993; Parish, Rudisill, & St. Onge, 2007; Wall, Rudisill, & Gladden, 2009), but they have not been used to measure PA levels of children with ASD. Reports in the literature indicate that children with ASD engage in less PA than their peers who show typical development as measured using accelerometers (Pan, 2008a, 2008b) and that children with ASD experience an increase in heart rate response during periods of rest compared to their peers who show typical development (Goodwin et al., 2006; Ming et al., 2005). Due to the preliminary nature of this study, the dearth of information regarding heart rate response to exercise by children with ASD, and due to the conflicting reports in the literature regarding the differences in PA levels between children with and without ASD, no hypotheses were proposed. Instead, the purpose of this study was to provide descriptive information regarding heart rate response and PA levels in preschoolers as measured using heart rate monitors.

Method

Setting

Data collection occurred on the playground of a preschool that serves children who show typical development and children with ASD. The school specializes in instructing children with ASD, and the teachers use empirically based teaching strategies endorsed by the National Research Council through which they encourage all children to engage in learning activities. During the time of data collection, 17 children (seven children with ASD and 10 children who show typical development) were enrolled in the two classrooms at the school. Each classroom had one head teacher, two full-time instructional assistants, and two graduate student special education interns in the classroom at all times, to maintain a 1:2 teacher–student ratio. The children experienced an outdoor play session twice a day on a playground where they had access to climbing bars, four swings, three sliding boards, and two climbing ladders. They were allowed to access PE equipment (i.e., balls, striking implements, scarves, ribbons, hoppy balls, stilt cups, and balance disks) during outdoor playtime, and the teachers modeled physically active behavior and demonstrated appropriate equipment use. The teachers were also responsible for monitoring the children's behaviors

to ensure that the children were engaging in safe activities. When the children engaged in appropriate physical play, the teachers used praise as reinforcement. No formal lesson plans were created for the physical play period.

Participants

The participants in this study were enrolled at a small school located in a small city in the southeastern United States. No girls with ASD were enrolled in the school at the time of data collection; however, autism is 4 times more common among males than females (Solomon, Miller, Taylor, Hinshaw, & Carter, 2012). Institutional review board approval was obtained from the university sponsoring the research project. Parents provided informed consent prior to the start of the study, and participant assent was obtained prior to affixing the heart rate monitors. Participants ranged in age from 4.33 to 6.83 years (M = 5.31, SD = .87) and were recruited from one class to limit the influence of the teacher on PA participation. Preschoolers were included in the study if they assented to wear the heart rate monitor for the duration of data collection. Of the nine children (five with ASD and four without ASD) enrolled in this classroom, one child with ASD (a boy) refused to wear the Actiheart heart rate monitor on all 6 days of data collection and consent was not provided for one child to participate in the research. Seven children (four typically developing children [two girls and two boys] and three boys with ASD) were participants for the study. Children who showed typical development were included as a quasi-control group to show the heart rate response of children without ASD before, during, and after exposure to the same physical play session. A single-subject design was employed rather than a group design because subtler changes may be detected (Callahan & Barisa, 2005; Forbes et al., 2011).

Measures

Actiheart heart rate monitors. The Actiheart heart rate monitor (9.5 grams, 32.4 mm in diameter x 18.7 cm in length; MiniMitter, Bend, OR, USA) was affixed to the child's left side of the chest with electrocardiograph electrodes positioned on the skin between the fourth and the fifth intercostal spaces in accordance with instructions from the *Actiheart Physical Activity, Heart Rate, and Energy Expenditure Analysis Instruction Manual* (MiniMitter Company, 2004). The Actiheart was configured to sample heart rate at an ep-

och length of 15 s by calculating the heart rate through measurement of the elapsed time between two consecutive R-waves. Data were recorded and stored in the heart rate monitor until they were downloaded onto a computer using a standard USB connection. Actiheart monitors have been demonstrated to be reliable (αICC = 0.993) and valid in use with human populations (Brage et al., 2005) and specifically in child and toddler populations (Durant et al., 1993; Parish et al., 2007; Rowlands & Eston, 2007; Wall et al., 2009).

Physical activity heart rate indices. The intensity of engagement in physical play was calculated using the PA heart rate (PAHR-25 and PAHR-50) index (Durant et al., 1993), a measure of the percentage of time spent above 25% or 50% of the resting heart rate in a given time interval. The PAHR-25 index is an indication of light to moderate physical play and PAHR-50 is an indication of MVPA (Durant et al., 1993). These PAHR measures have been found to be reliable for use with young children during physical play sessions, with reported Cronbach's alphas for within day $r = .92$ and .88 and between day $r = .81$ and .56 (Durant et al., 1993). Because the children wore the monitors for the majority of their school day (including naptime), the mean of the lowest 10 consecutive data points (i.e., 2.5 min) of heart rate for each day of data collection was used to determine resting heart rate for that day. Children without ASD experienced their lowest 10 consecutive data points during the 90 min dedicated to naptime, indicating a true resting heart rate. However, because children with ASD experience poorer quality sleep than their peers who show typical development (Wiggs & Stores, 2004), the lowest 10 data points indicating resting heart rate for children with ASD did not necessarily occur during naptime. The mean resting heart rate (derived from all 6 days of data collection) was calculated for each child and used to determine each individual's PAHR-25 and PAHR-50 scores for each day.

Design and Implementation

Data were collected on Tuesday and Thursday every other week for 6 weeks for a total of 6 data collection days. Although the children experienced two 30-min outdoor free play periods per day (a morning and afternoon session), data were collected and analyzed from the morning free play period only. The morning play period was used for PE time and was supervised by the classroom teachers and student assistants. As the afternoon play period was used as recess only, it was sometimes used as a reward for positive behavior.

Because of the potential impact this "reward" would have on the PA participation levels of that play period, the afternoon outdoor play session was excluded from data analysis.

Procedures

On data collection days, an Actiheart heart rate monitor was affixed to participants upon their arrival at school, approximately 2 hr prior to the children's outdoor play period. Heart rate monitors were removed if a child expressed discomfort or dissatisfaction with the monitor or just before dismissal from school (after approximately 5 hr of wear), whichever came first. Since the children wore the heart rate monitors for a longer duration than that of the morning outdoor play period, the researchers were able to obtain a resting heart rate and a profile of each child's heart rate response to physical play. Data were collected on 6 days to determine a more reliable heart rate response of the child.

Data Analysis

Although participants wore the heart rate monitors for approximately 5 hr, the focus of this study was to monitor the heart rate data collected by the Actihearts for 30 min prior to the physical play period, during the 30-min play period, and for 30 min after the physical play period. The heart rate monitors had a 15-s epoch length, yielding 120 data points per participant during each 30-min period. The children wore the monitors prior to, during, and following the physical play periods, yielding 360 data points per participant each day of data collection. These 360 data points were then collapsed into a mean heart rate for each minute during the 90 min of interest before, during, and after the physical play period. Because of the descriptive nature of this study, mean heart rate per minute was calculated from the 15-s epochs. To do so, the four data points comprising each minute of data collection were collapsed to form a mean heart rate per minute.

The mean heart rate per minute from all 6 days of data collection was averaged to calculate the mean heart rate for the 30 min prior to, during, and following the physical play period. This data reduction process allowed the researchers to present a daily snapshot of the heart rate response and PA levels of children with and without ASD. Descriptive statistics (mean and standard deviation) were used to describe each child's heart rate response. Because the reduction process involved calculating the mean heart rate per minute across 6

days of data collection and the small sample size ($n = 7$), parametric statistical tests were not conducted. Rather, a single-subject design was used to highlight individual heart rate response attained during an unplanned free play period, and nonparametric statistical tests (Mann-Whitney test) were used to analyze PA levels as measured using PAHR-25 and PAHR-50 scores of children with and without ASD.

Results

Heart Rate Responses

The mean resting heart rate, mean heart rate before physical play, mean heart rate during physical play, and mean heart rate after physical play for each child are shown in Table 1. The data in Table 1 indicate that children with and without ASD have similar heart rate responses before, during, and after a physical play session.

Table 1
Participant Demographic Information and Mean Heart Rate Results for Resting, Before, During, and After Physical Play

		Heart Rate			
Participant	**Age**	**Resting**	**Before play**	**During play**	**After play**
1[a]	6 years, 10 months	89.8 ± 6.96	134.77 ± 6.81	145.44 ± 5.16	120.03 ± 4.60
2[a]	5 years, 6 months	91.7 ± 2.69	113.48 ± 3.28	129.79 ± 4.36	114.42 ± 2.17
3[a]	6 years, 0 months	88.9 ± 9.37	137.24 ± 3.68	145.35 ± 4.96	124.86 ± 6.18
4	5 years, 0 months	79.4 ± 5.59	115.85 ± 5.00	136.75 ± 4.31	117.52 ± 3.71
5	4 years, 9 months	86.1 ± 2.80	125.70 ± 10.93	144.49 ± 9.09	113.86 ± 5.92
6	4 years, 4 months	98.4 ± 2.07	149.81 ± 6.00	155.96 ± 6.23	113.86 ± 3.40
7	4 years, 4 months	87.9 ± 7.98	129.90 ± 4.89	150.58 ± 7.75	128.67 ± 3.79

[a]Children with ASD.

Physical Activity Levels

Mean PAHR-25 and PAHR-50 scores for children with and without ASD across the six outdoor free physical play sessions are shown in Table 2. As is evident by the percentages of time that the heart rates were above the PAHR-25 threshold points, both children with and without ASD spent a majority of their time in light to moderate PA. Six of the seven children spent very little time in MVPA as is evident by the percentage of time spent above the threshold for PAHR-50 scores. Using the Mann-Whitney test, the researchers found no difference between children with and without ASD for

resting heart rate, $U = 3.00$, $p = .29$, $r = .40$, and the percentage of time spent above PAHR-25, $U = 6.00$, $p = 1.00$, $r = .00$. However, the Mann-Whitney test indicated the percentage of time spent above PAHR-50 was greater for children without ASD than for children with ASD, $U = 0.00$, $p = .034$, $r = .801$.

Table 2
Average Resting Heart Rate (RHR), PAHR-25, and PAHR-50 Scores for Children With and Without ASD During Physical Play

Participant	RHR	PAHR-25	PAHR-50
1[a]	89.8	92.49%	10.19%
2[a]	91.7	75.84%	2.72%
3[a]	88.9	75.75%	23.12%
4	79.4	92.11%	54.61%
5	86.1	75.17%	31.03%
6	98.4	90.00%	60.00%
7	87.9	83.01%	26.80%

[a]Children with ASD.

The average heart rate in beats per minute across all 6 days of data collection is shown in Table 1. The average heart rates of the children in the study were similar across all 6 days of data collection (Figure 1). Minutes children with and without ASD spent in MVPA by day as measured using PAHR-50 scores are shown in Table 2. Two of the children with ASD obtained the most MVPA during the second day of data collection than all of the other children on all other days. The percentage of time spent in MVPA as depicted by PAHR-50 scores is shown in Figure 3. Most of the children (with and without ASD) spent less than 30% of the outdoor play period in MVPA. Two of the children without ASD obtained similar amounts of MVPA across all days of data collection, whereas in Figure 3, it is clear that one child with ASD was very physically active on the first and second day of data collection. However, the children without ASD did not participate in MVPA for more than 20% of the time.

Discussion

Despite the small sample size ($n = 7$), the preliminary data indicate that children with ASD and their peers who show typical development may exhibit similar profiles of heart rate response before, during, and after an outdoor physical play session in which teach-

ers modeled appropriate play activities. PAHR-25 scores indicated similar light to moderate PA engagement for children with and without ASD. However, when examining the mean PAHR-50 scores, the researchers found that children with ASD appear to participate in less MVPA than their peers.

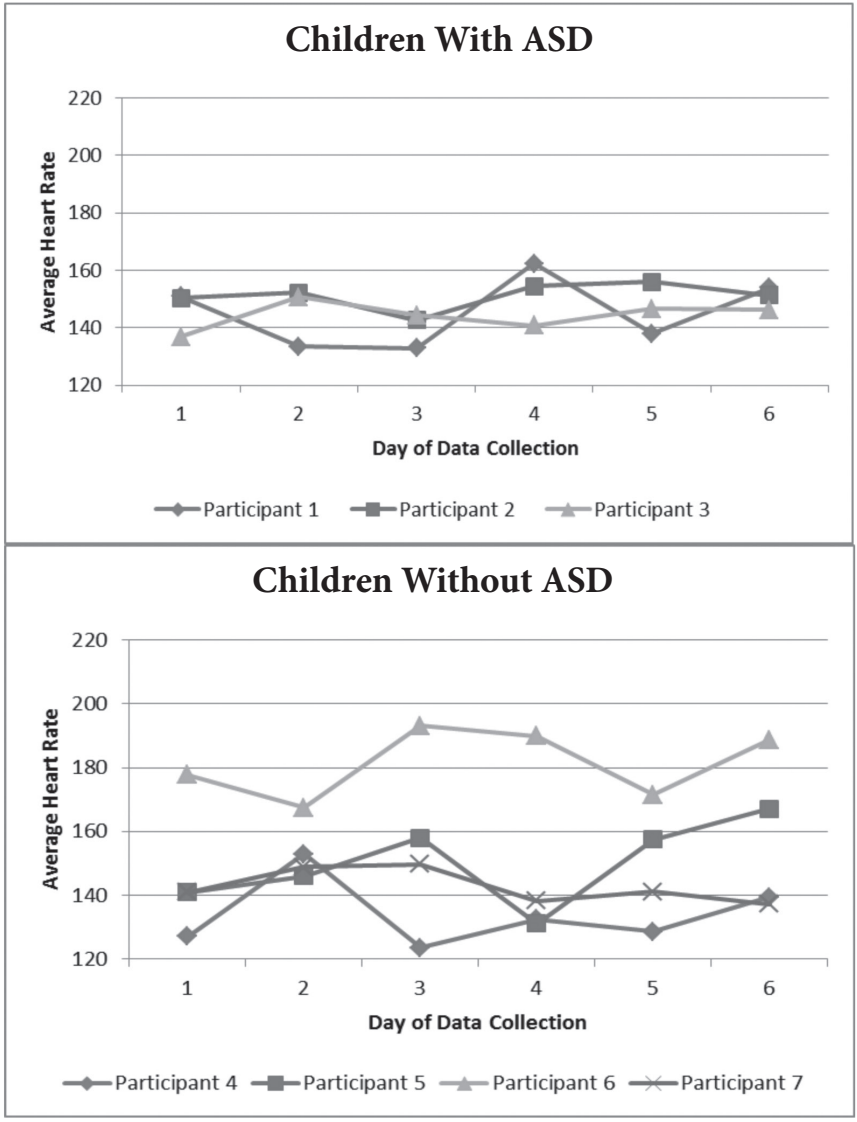

Figure 1. Average heart rate in beats per minute across all six days of data collection for children with and without ASD.

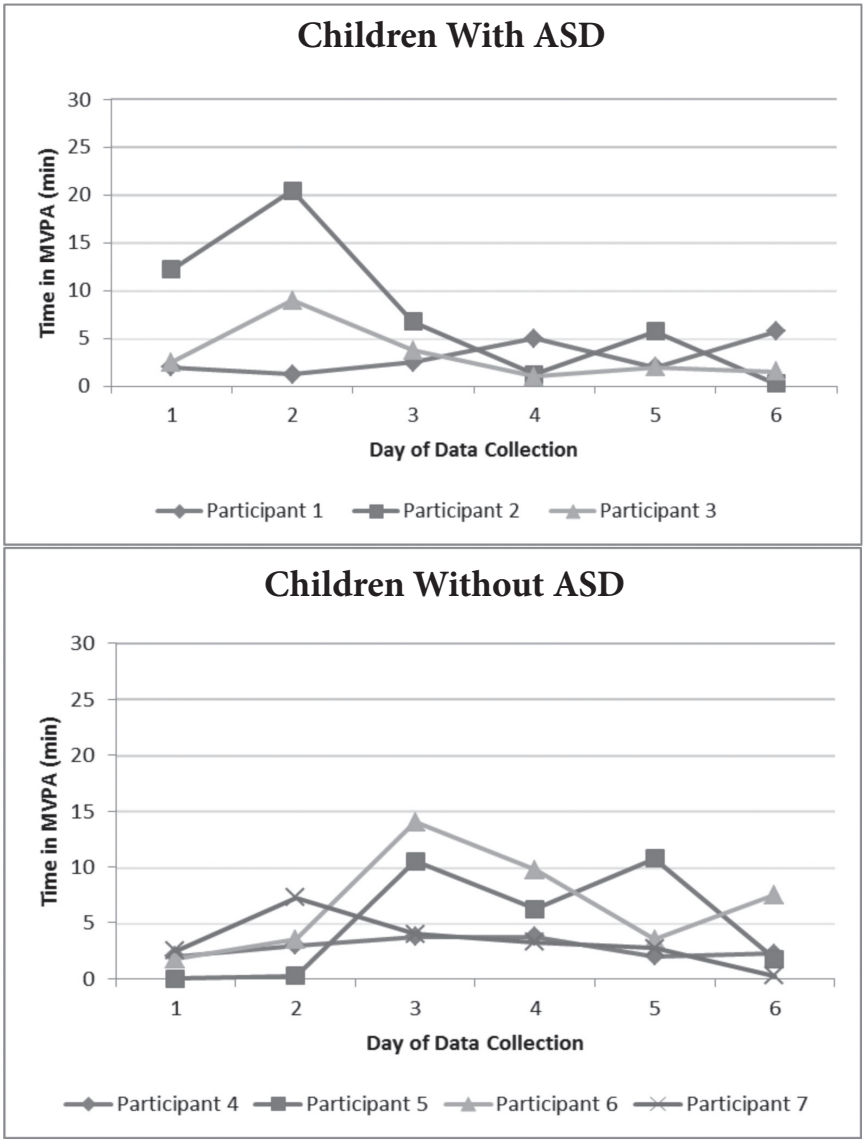

Figure 2. Time in minutes children with and without ASD spent in moderate to vigorous physical activity during free play across all 6 days of data collection.

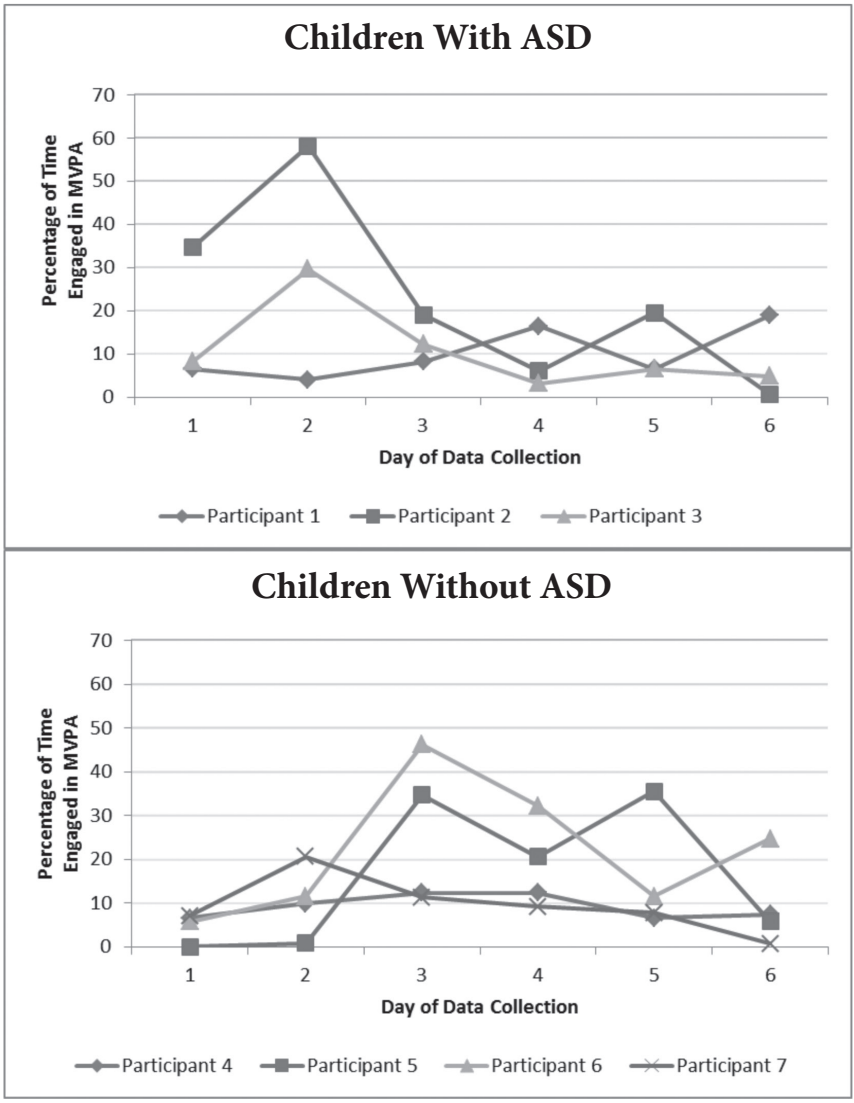

Figure 3. Percentage of time children with and without ASD spent in moderate to vigorous physical activity during the free play session across all 6 days of data collection.

The mean and standard deviations for heart rate before, during, and after physical play are shown in Table 1. All children exhibited a heart rate response within the range of normal for their age group (Malina, Bouchard, & Bar-Or, 2004; Wallis, Healy, Undy, & Maconochie, 2005). During the 30 min preceding the outdoor physical play period, mean heart rate response was between 113 and 150

bpm. During the outdoor play period, the mean heart rate range was between 130 and 156 bpm, and finally, during recovery from the outdoor play period, the children's mean heart rate was between 114 and 129 bpm. These findings indicate a similarity in the heart rate response to an outdoor play period, regardless of the presence or absence of an ASD diagnosis.

While examining the PAHR-25 and PAHR-50 scores to determine the children's PA levels, the researchers found that the four children without ASD spent a larger percentage of time participating in MVPA during the outdoor play period than the children with ASD. Similarly, all of the children with ASD and two children without ASD did not spend at least 40% of the free play session in MVPA. This 40% recommendation is the minimum percentage of time spent in MVPA during free play that, combined with other opportunities for PA throughout the day, would ultimately result in meeting the recommended daily PA guidelines (Ridgers, Stratton, & Fairclough, 2005). This recommendation was developed following an analysis of children's PA levels during outdoor free play (Ridgers et al., 2005). In that study, the children who participated in MVPA for a minimum of 40% of the outdoor free play session exceeded 30 min of daily PA. However, the outdoor free play sessions in that study were longer in duration, at an average of 85 min, than in the present study consisting of 30-min sessions. Nonetheless, all participants in the present study participated in light to moderate PA for the majority of the outdoor free play sessions (an average of 69.31% to 92.49%) as measured using PAHR-25 scores, and no statistical difference was found between children with and without ASD in light to moderate PA as measured using PAHR-25 scores. Thus, the data presented here is in support of the literature documenting that preschool children do not participate in adequate PA during outdoor free play periods during the school day (Brown et al., 2009).

Limitations

There are several limitations worth noting in this study. The first pertains to the sample of participants. The sample used in this study was small ($n = 7$) and contained no girls with ASD, which may limit the generalizability of the results of the study. However, given the increased prevalence of ASD in boys rather than girls, the information about heart rate response and PA levels of children enrolled in preschool from this study is valuable. The preschool used in this study may be an additional limitation to the study. This study examined children enrolled in a model educational program for children

with ASD. These children's teachers modeled appropriate PA during the outdoor play period, which may not be the case in other settings. Additionally, the results of this study cannot be used to imply that children with ASD or their classmates who show typical development do not attain adequate amounts of daily PA because PA during nonschool hours was not measured. Another limitation to this study is that information regarding the cognitive or communicative functioning of the children was not collected. Particularly for children with ASD, this factor may have had an effect on their play skills and behaviors during the outdoor free play period. It is not possible to say whether such factors had an effect on heart rates (and in turn, PA levels) because these data were not collected. Additionally, there was difficulty in obtaining a resting heart rate for the children with ASD, which could have had an impact on the PAHR-25 and PAHR-50 indexes. As the lowest 10 consecutive data points on each day of data collection were averaged to obtain the resting heart rate, and these were not necessarily obtained during naptime, it is possible that PAHR-25 and PAHR-50 indexes were skewed higher than appropriate. Thus, future researchers should consider employing a research design that allows for heart rate monitoring for 24 hr, to obtain a true resting heart rate response.

Difficulties researchers face when examining the heart rate response and PA levels of children with ASD in outdoor play settings were also examined in this study. Specifically, children with ASD may not be willing to wear devices designed to measure PA. On the last day of data collection, the teachers at the school where data collection occurred reported that some children (with and without ASD) disliked wearing the heart rate monitors. One child physically removed his heart rate monitor following the outdoor play period on 4 of the 6 days of the study. Additionally, information regarding the medications children consumed was not collected. Many medications (particularly the antipsychotic medications commonly prescribed to children with ASD) have an effect on heart rate, but it is not possible to say whether the medications children took had an effect on their heart rates because these data were not collected. Finally, heart rate and PA data collected in outdoor play settings could have been altered by the weather (Hajat, O'Connor, & Kosatsky, 2010). The fourth day of data collection, as per the researcher's field notes, was unseasonably warm, whereas other days included typical weather patterns for the climate in which the data were collected.

Suggestions for Future Research

Given the small sample size and the lack of parametric statistical testing employed in this study, further exploration of the heart rate response (and in turn, PA levels) of children with and without ASD during free play is needed. Additionally, researchers wishing to study PA levels of children with ASD using heart rate should obtain information pertaining to participants' medication use and participant enjoyment or tolerance of the heart rate monitor. Furthermore, information pertaining to the ambient temperature during data collection may also be valuable to interpretation of the heart rate data, as temperature may have an effect on heart rate (Ren et al., 2011).

Conclusions

Depite these limitations, the heart rate profiles and PA data from this study are a cause for concern regarding preschool policy. From a PA perspective, this study indicates that an outdoor free play setting does not provide adequate PA for children. The teacher-involved outdoor free play experience examined in this study would count toward the 60 min of structured PA recommended by the National Association for Sport and Physical Education (2002); however, the recommendations of Ridgers et al. (2005) may not be met. To obtain health benefits, Ridgers et al. recommended that children spend 40% of the recess physical playtime in MVPA. Only one girl without ASD met this recommendation on 1 day of data collection. Although this PE experience featured teacher modeling to show children how to use PE equipment to engage in PA, the data indicate that children who show typical development and children with ASD did not engage in adequate amounts of MVPA. These data are especially concerning as best practice for preschool PA programming is that teachers should model physical play for children during PA opportunities such as free play (McWilliams et al., 2009), yet the participants in this study still did not exhibit MVPA for a minimum of 40% of the free play period. Further research in this area is warranted, as this is a preliminary study only intended to report descriptive information. Thus, researchers should further explore the heart rate response and PA levels of children with and without ASD during unplanned free play and work to develop empirically supported strategies for increasing MVPA levels during free play and disseminate these findings to preschool policy makers.

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METHODOLOGY

Insidious Influence of Gender Socialization on Females' Physical Activity: Rethink Pink

Nicole M. Mullins

Abstract

Continually accumulating information on the health risks associated with sedentary lifestyles indicates a severe public health need for increased physical activity, as well as for careful attention to factors that can curtail it. Study and documentation of such factors, however, are not enough to promote widespread change in firmly established sedentary behaviors; if they were, the many existing informants of inactivity's ills would have already done so. Accurate information needs not only to reach those who need it, but also to be communicated in ways that demonstrate relevance and importance. The purpose of this paper is to enhance awareness, specifically among physical education and exercise science majors, of some of the many socializing influences that render girls less physically active than boys from early ages. The underlying intent is to promote changes that could enhance the future health and fitness of the female population.

Honestly ask, "Have I ever…

- helped a young girl perform a task that I allowed a boy of the same age to perform independently?"
- allowed a young girl to perform a skill with improper form, but ensured that a boy learned it properly?"
- complimented a female by comparing her to a male?"

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- employed an expression such as 'You throw like a girl' as a criticism?"
- clothed, or seen a female child clothed, in a way that restricts her ability to play?"
- struggled to find a toy for a young girl in a color other than pink?"
- purchased toys or sports equipment that promote physical activity for young boys, but products that promote sedentary play for girls (e.g., fancy dresses, makeup kits, dolls, tea sets)?"

If you answered yes to any of these questions, or at least recognize that many people would, you are acknowledging a few of many gender socialization practices, which have real ramifications for the health and fitness of the female population. *Gender* has been defined as "sets of traits or behavioral dispositions that people come to possess based on their assignment to a particular sex category" (Wharton, 2005, p. 7) and *socialization* as the "process whereby individuals acquire information about acceptable and unacceptable responses, including developing social, cognitive, and physical skills" (Solmon & Lee, 2008, p. 229). Together, *gender socialization* may be considered the "processes of social expectations, control, and struggle" that sustain male–female traditions (Ferree & Hall, 1996, p. 935). These processes are continuous, are complex, and are shaped by many influences, including family members, peers, teachers, coaches, coworkers, and media agencies (Stromquist, 2007).

Some hold that "aging successfully starts at birth" and that there are "critical points in time where well-timed education, referrals, or interventions by health and fitness professionals could help clients shape a preventive health care game plan for successful aging" (Sanders & Nguyen, 2011, p. 37). However, the potential for successful aging may be at least partially determined before birth, through the establishment of environments that will either promote or impede physically active lifestyles. Definitions of *successful aging* are complex and vary across disciplines (Kanning & Schlicht, 2008), but *physical function* has been the most frequent inclusion across cultures and countries, among academicians and laypeople (Hung, Kempen, & DeVries, 2010). Good physical function empowers diverse daily, occupational, leisure, and social activities and enhances subjective well-being (Kanning & Schlicht, 2008; Rikli, 2005). Therefore, regular physical activity crucially contributes to

successful aging by helping people develop and maintain healthy physical function. The purpose of this article is to enhance mindfulness of the influences of gender socialization on physical activity, health, and successful aging, to promote changes in habits that limit physical activity exposure, competency, and self-efficacy among girls and women.

Sociologists routinely discuss the tendencies of gender traditions to restrain women and men from engagement in certain activities (Lindsey, 2011), and some have specifically identified such restraints on physical activity and sports (Schmalz & Kerstetter, 2006). However, such discussion is less common in other disciplines, including physical education and exercise science. With the curricula of many degree programs now viewable online, it is easy to see that many physical education and exercise science majors require a general sociology course, but not a discipline-specific one. Thus, although most students will study some gender-related issues, they may not specifically examine them with respect to physical activity. Since gender socialization may profoundly affect youth physical activity—a known correlate of adult physical activity (Telama et al., 2005)—this is shortsighted. Physical education and exercise science majors will eventually assume leading roles in administering physical activity programs, and it is imperative that they understand the impact of gender stereotypes on physical activity and health. Thus, in addition to promoting greater awareness of gender socialization effects on physical activity, an important secondary objective is to motivate readers to delve into the related literature. The branches of this topic are extensive, and there is much to learn about how to avoid perpetuating the common gender-stereotyped behaviors that render girls less active than boys in schools, sports, recreational settings, and home environments.

Many researchers have documented that males are more physically active than females, at many stages of development, in many settings, beginning at early ages (Beighle, Morgan, Le Masurier, & Pangrazi, 2006; Eaton et al., 2010; Faucette, 1995; Jago, Anderson, Baranowski, & Watson, 2005; Ridgers, Stratton, Fairclough, & Twisk, 2007; Sallis, Prochaska, & Taylor, 2000; Trost et al., 2002; P. Tucker, 2008). Although research on physical activity among children of preschool age is limited, some findings are noteworthy. P. Tucker (2008) reviewed 39 studies, involving more than 10,000 preschoolers and reported that among the 18 that examined sex differences in physical activity, 16 showed that male preschoolers were

more active than females. These findings from studies of young children indicate how early socialization behaviors may substantially affect children's physical activity levels. Since the gender gap in physical activity levels only widens as children age (Jago et al., 2005; Sherar, Esliger, Baxter-Jones, & Tremblay, 2007), and since adult physical activity is a direct correlate of youth physi¬cal activity (Sallis et al., 1992; J. Tucker et al., 1995), patterns of reduced activity among preschool girls may have profound implications for the activity levels, fitness, and health of adult women.

Recent statistics on adolescent physical activity from the Youth Risk Behavior Surveillance System (YRBSS) reveal significant gender disparities (Eaton et al., 2010). Although only about 37% of ninth to 12th graders nationwide accumulate the recommended levels of weekly physical activity, the percentage of girls that meets recommendations is even lower (girls, 27.7%; boys, 43.6%). Additionally, compared with boys, girls attend fewer physical education classes (Eaton et al., 2010), participate less during physical education (Eaton et al., 2006), belong to fewer sports teams (Eaton et al., 2010; McKenzie, Marshall, Sallis, & Conway, 2000; Pratt, Macera, & Blanton, 1999), and engage in less physical activity during recess and outside of school (Beighle et al., 2006; Pate et al., 2002; Ridgers et al., 2007; Trost et al., 2002).

Important research and modern initiatives indicate that "Exercise is Medicine" (www.exerciseismedicine.org) and that, as a nation, we need higher doses to curb the premature morbidity and mortality associated with physical inactivity (Jonas & Phillips, 2009). To achieve higher effective doses, society needs to counter many factors that contribute to sedentary living, including the overfeminization of girls. Even before babies are born, the environments that await them are often furnished with items that teach girls and boys traditional homemaker and breadwinner roles. Socialization studies, spanning decades, have shown that boys' clothing, surroundings, and toys generally support sports activity and aspirations of future work outside the home (Blakemore & Centers, 2005; Fisher-Thompson, 1990; Rheingold & Cook, 1975). In contrast, girls' surroundings often facilitate early training for less physically demanding domestic chores, parenting, and self-grooming (Basow, 1992; Blakemore & Centers, 2005; Eccles, Jacobs, & Harold, 1990; Tauber, 1979). Essentially, as girls rehearse engaging in home-, child-, and self-care, they also learn to spend less time in physically active, healthful play.

Rethink Pink

Before going further, please list the first five adjectives you associate with *pink*.

Despite that this paper's title and introduction may have led you to scrutinize your replies, past experience and prior evidence (Koller, 2008) suggest that

(A) you did not list *aggressive, capable, strong, powerful, ambitious*, and *driven* and

(B) you did list *pretty, soft, sweet, feminine, delicate, fragile*, and *girly*.

The point of this exercise is to reveal common tendencies to associate (B) or dissociate (A) certain attributes with pink and, arguably, anyone wearing pink. Such tendencies have been documented (Koller, 2008), and one need not be an astute observer to see how few parents dress their boys in pink, presumably to avoid affiliation with a hallmark of femininity (Karniol, 2011). If pink were merely a color, devoid of nuance, boys would be similarly surrounded by it, clad in it, and given toys embellished with it. Instead, boys are blanketed in blue and steered away from anything pink and its soft significance.

Some researchers have proposed biological bases for color preferences (Alexander, 2003; Hulbert & Ling, 2007), but most support social learning as the major determinant (Cohen, 2013; Cunningham & Macrae, 2011; LoBue & DeLoache, 2011). Children begin to learn what they should prefer from the moment they are wrapped in pink and blue blankets and brought home to pink and blue bedrooms. LoBue and DeLoache (2011) investigated whether young children demonstrate color preferences by dividing 192 children into six age groups (7–11 months, 1 year, 2 years, 3 years, 4 years, 5 years) and asking them, over eight trials, to choose their preference of a pair of identical objects of different color. One object within a pair was always pink, and the objects were presented in counterbalanced fashion, with respect to gender, age group, and right or left orientation. Results showed no evidence of gender differences in color preferences within the youngest age groups. However, by age 2, girls' liking for pink increased, whereas it decreased among boys, creating a sizeable difference by age 4. Girls' preferential selection of pink reached significance by ages 3 and 4, and boys' nonselection of it was significant at ages 2, 4, and 5. Thus, it appears that children's tendencies to choose or to avoid pink emerge only with

increasing age, as they observe, learn, and receive reinforcement for adhering to color conventions. In a study specifically designed to investigate color associations in adults, no men (17–96 years) identified pink as their favorite color and 20% listed it as their least favorite (Koller, 2008).

Color and "appropriate" activity stereotypes (Azzarito & Solmon, 2009; Schmalz & Kerstetter, 2006) are so pervasive that many people fail to see them as such, increasing the difficulty of change. *Why change?* First, the fundamental concept of freedom centers on the "power to determine without restraint" ("Freedom," n.d.). Gender conventions subvert this right for children by limiting their acceptable options. *Where there are 10 girls' tops on a rack and seven of them are pink, are there really 10 choices? Where female children are given toy vacuum cleaners, Easy Bake Ovens, dolls, and Rapunzel dresses, what are the chances that they, at some point, will "play house," "take care of their babies," and "wait for rescue by a handsome prince"? Where girls are not given a diversity of sports equipment and action-oriented toys, what are the chances that they will develop diverse motor skills and activity experiences?* Gender stereotypes limit the characteristics and the skills that children can develop.

Second, change is needed because many gender stereotypes perpetuate lower physical activity levels among females, which affect health. The pervasiveness of the stereotypes cannot be adequately characterized here, but a few examples indicate their range. Pomerleau, Bolduc, Malcuit, and Cosette (1990) evidenced parental gender stereotyping, in analyzing the bedrooms, toys, and clothing of children 5–25 months old. Girls had more pink pacifiers, pink clothes, dolls, dollhouses, and toy household appliances (e.g., ovens, vacuum cleaners), and boys had more blue pacifiers, blue clothes, sports equipment, and occupation-oriented toys (e.g., medical kits, tools). Nelson (2000) analyzed 469 Halloween costumes and classified a mere 8.7% as gender neutral (i.e., ads or packaging displayed boys and girls or ambiguous figures as models). The majority targeted a specific gender, with the greatest percentages of female costumes depicting princesses and beauty queens and the most prevalent male costumes portraying villains, superheroes, and warriors. Villains, superheroes, and warriors are perpetrators, saviors, and fighters; princesses and beauty queens are passive figures to be ornamented and admired. Bridges (1993) reported that birth congratulations cards for girls were dominated by pink and images of sedentary activity (e.g., sitting, lying down), and cards for boys

were predominantly blue and depictive of active behaviors (e.g., walking, climbing, reaching).

Readers who question the recency of the previous findings need only attend a baby shower where the sex of the expected child is known and observe the character and colors of the gifts. Explore the website of a children's store, such as Babies "R" Us or The Children's Place, and view the clothing options. A recent search (7-5-13) of the subcategories Baby Clothes, Baby Girl Clothes, and Tops at BabiesRUs.com yielded 42 tops for girls, with 30, or 71%, being or bearing pink. In contrast, only one top among 29 (3%) within the subcategory Baby Boy Clothes contained *any* pink, among many other colors. Investigate children's bedrooms and toy chests, and browse the aisles of a toy store or the products on a toy store website.

Girls' and boys' disparate surroundings directly influence their play activities. Girls spend significantly more time playing with dolls, in "house," and "dress-up" activities, whereas boys spend more time with construction and vehicular toys (Freeman, 2007; Giddings & Halverson, 1981; O'Brien & Huston, 1985). However, kids play with the toys made available to them. Relatively few boys learn young that they will one day have to wash clothes, change diapers, push baby strollers, vacuum, and dust because relatively few people give boys toys that simulate "women's work." Similarly, relatively few girls are given toy excavators, harvesters, race cars, and footballs, and it is therefore not surprising that tremendous gender discrepancies in certain careers and in sports participation remain. Parents have been shown to report much greater support for cross-gender play (e.g., girls playing with trucks, boys playing with dolls) than their children perceive (Freeman, 2007), indicating a discrepancy between what parents profess and what they communicate to children. What is important to recognize is that wider ranges of play experiences allow children to explore wider ranges of roles and skills. Domestic chores are important for everyone to learn—girls and boys—just as regular physical activity is vital to the health and competency of all people to participate fully in life.

State of Affairs: Gender Equity in Sports and Physical Activity

Gender stereotypes and bias *still* limit the physical activities in which girls participate, persist, and succeed. Title IX's prohibition of sex discrimination in federally funded educational programs (U.S. Department of Justice, 2001) has greatly increased athletic partici-

pation among girls and women, yet noncompliance with the act is widespread and inequities persist (Braddock, Sokol-Katz, Greene, & Basinger-Fleischman, 2005; Simon, 1993/1994; Stafford, 2004). Mandatory compliance reports on American public schools showed that in 2000, girls were still 29% less likely than boys to participate in interscholastic athletics, which may partially reflect the 10% fewer sports teams available for girls (Braddock et al., 2005). A recent gender equity report from the National Collegiate Athletic Association (NCAA) substantiates the persistent inequities in total expenditures, personnel, and other forms of support for male compared with female sports; for example, despite that female undergraduates constitute the greater proportion of student bodies at Division I institutions (53.3%), the average number of female student-athletes per institution is 218, compared with 269 for males (DeHass, 2008). At Division I institutions, overall expenditures for women's teams are essentially half those for men's teams (51.4%), and trends are similar for Divisions II and III. The persistence of the inequities is substantiated in the NCAA (2008) gender equity manual:

Problems arise where institutions create spacious and well-furnished locker rooms for football and men's basketball and no similarly appointed locker rooms for women's teams. Access to luxury items in locker rooms also creates compliance problems when those are not distributed equitably between men's and women's teams. (p. 208)

Media coverage is another well-documented area of inequity and means of perpetuating gender stereotypes. Eastman and Billings (2000) reported that throughout 11 weeks of ESPN's *SportsCenter* and CNN's *Sports Today*, 95% and 93% of coverage, respectively, was devoted to male athletes. During the same time frame, *USA Today* dedicated 5 times as much space to male versus female athletes and *The New York Times* 10 times as much. Only 10% of articles and photos from 36 issues of *Sports Illustrated* (Fink & Kensicki, 2002) and only 24% of photos from the same volume of *Sports Illustrated Kids* featured female athletes (Hardin, Lynn, Walsdorf, & Hardin, 2002). An analysis of 602 issues, from 43 daily newspapers, collected over 1 year, showed that more numerous articles, more physical space, more favorable positioning (e.g., front page, higher on page), and more photos were dedicated to male versus female athletes (Pedersen, 2002). In their investigation of media from 39 colleges and universities, ranging in size, location, and socioeconomic status, Huffman, Tuggle, and Rosengard (2004) revealed that

73% of sports stories in campus newspapers and 82% of campus sportscasts covered male athletes. Cooper and Cooper (2009) analyzed 630 intercollegiate athletics Web pages and found that women were underrepresented compared with men in all assessed areas: advertisements (29.7% vs. 70.3%), articles (40.0% vs. 60.0%), multimedia (78.1% vs. 21.9), and photographs (39.7% vs. 60.3%). These findings are particularly noteworthy in that intercollegiate websites should be in compliance with Title IX regulations for gender equality in collegiate athletics, including publicity (U.S. Department of Justice, 2001).

Qualitative differences give even greater dimension to gender bias in the media coverage of male and female athletes. Higgs and Weiller (1994) reported that television networks provided significantly less air time for women's events compared with men's during the Olympic Games and often joined women's events "in progress" (p. 237) while providing preview coverage of many men's events. Analysts distinctly upheld traditional notions of male dominance and female deference, as they spoke at length about males' strengths, abilities, successes, and difficult tasks and about females' weaknesses, appearances, and emotions. They framed male athletes as competitive, strong, powerful, and fast and spoke little about their personal lives or emotions. In contrast, they described female athletes with words and phrases that included "long beautiful legs" (p. 240), "gorgeous," "Cinderella," "fragile" (p. 241), "prettier now with long hair," "babe" (p. 242), "prettiest nails in the competition," and "a little too chunky for this event" (p. 244). Analysts provided extensive coverage of one gymnast's fall off the balance beam and her ensuing tears. Despite that some male athletes are "chunky" and that some cry, there were no parallel commentaries on males' body weights or tears.

Male athletes are more often presented in uniform and in action, with photos that convey competence and strength, whereas female athletes are often presented out of uniform, in passive positions, with images that express femininity, sexuality, and even seduction (Buysse & Embser-Herbert, 2004; Fink & Kensicki, 2002; Hardin et al., 2002; Higgs & Weiller, 1994; Kane & Buysse, 2005).

An example of this is one media guide cover that portrayed the women's basketball team in formal gowns with heavily made up faces and styled hair. The message communicated is not about basketball. There is no evidence anywhere on the cover that suggests that this is a basketball team. Rather, it appears that they might

be candidates for homecoming queen. (Buysse & Embser-Herbert, 2004, p. 79).

A 2010 issue of *Golf Magazine*, a publication that primarily features male golfers, included an article on Michelle Wie (Barrett, 2010). A two-page photo spread, beginning on page 72, showed Wie lying alluringly on the grass, in a lacy top, dress pants, and heels. Nothing in the photo indicates that Wie is a golfer or that she is even lying on golf course grass, as no flagstick, hole, or cut lines are visible. In only one of eight photos within the article, the smallest at about the size of a postage stamp, is Wie demonstrating any physical ability, swinging a club (p. 79). Media framing has been said to trivialize the endeavors of female athletes by focusing on their appearances, emotions, and unrelated life activities (Carty, 2005; Duncan & Messner, 1998; Fink & Kensicki, 2002; Higgs & Weiller, 1994). Examination of local newspapers, major sports magazines, newscasts, and Web pages will verify the persistence of these inequities.

Societal conventions are such that many people often do not recognize as sexist the many things they see, hear, say, and do that are, in fact, sexist. As indicated, sportscasters sustain conventions through the glorification of male and subordination of female athletes. Some show clear tendencies to refer to female athletes as "girls," but not to refer to male athletes of comparable age as "boys" (Higgs & Weiller, 1994; Higgs, Weiller, & Martin, 2003), and to refer to males by their last names, but females by their first (Duncan & Messner, 1998; Halbert & Latimer, 1994). In a study of U.S. Open tennis match commentaries, analysts referred to female players solely by their first names 57% of the time compared with a mere 8% of the time for male players (Duncan & Messner, 1998). Some commentators praise female athletes by comparing them to male counterparts, as one compared Venus Williams to Pete Sampras (Eastman & Billings, 2000). Although the popular press has compared Annika Sorenstam to Tiger Woods, Lisa Leslie to Michael Jordan, Mia Hamm to David Beckham, and Natalie Coughlin to Michael Phelps, few can imagine hearing the reciprocals. The problem with these media tendencies is that many who hear them later mimic them in other venues, including sports practices, physical activity programs, and physical education classes. In her observations of approximately 50 physical education classes, Griffin (1981) noted that teachers made several male-praising comments such as "Mary, you throw as well as the boys" and "Jane is a great athlete for a girl" (p. 15). Though Griffin's report was published decades ago, this author continues to hear such comments frequently. Wright (2001) reported

merely a few of hundreds of examples of language and behaviors provided by physical education teachers, which reinforce restrictive notions of femininity and masculinity, including quotes such as "You can't let a girl beat you" and "Don't pass it to ... she might break a nail", comments made to ridicule boys such as alluding to "playing like a girl", and practices such as bringing in the pitcher's plate because a girl is pitching (p. 15).

Examples such as those above, along with the many subtle day-to-day instances of gender bias, can detract from the fun of sports and physical activities for some girls and women. Golf courses are some of the most fertile ground for sexism. Some course executives still maintain male-only membership policies, and many more restrict women from playing on certain days of the week and at certain times of day (Lenkiewicz, 2011). "Women's tees" and "men's tees" persist as common terms, despite that the United States Golf Association (2008) designates various teeing ground locations as "forward," "middle," and "back tees" and urges golfers to play from those suited to their ability levels, not their gender. Despite the prevalence of slow play on many golf courses, among many types of players, women are commonly assumed to be slow players before ever giving evidence of being so (McGinnis, McQuillan, & Chapple, 2005).

Changing the State of Affairs

For girls to develop comparable levels of physical self-competence as boys, they need to be routinely given the same exposure to sports and physical activities, the same quantity and quality of instruction, the same patience with their mistakes, and the same recognition of their efforts. Inequities in physical activity settings *have* shrunk, but they still exist. Conduct an informal investigation of exposure by surveying the preschool sports programs at a local YMCA or recreation center. If there were gender equity, there would be an approximate 50–50, boy–girl split in commonly offered activities, such as tee-ball, swimming, soccer, and basketball. However, male majorities abound and will continue to do so until more people recognize the harm in providing girls with fewer early opportunities to develop motor skills and active behaviors.

Parents, teachers, and coaches influence children's skill acquisition through the amounts and type of instruction, supervision, and feedback they provide. Research has shown that physical education teachers (Dunbar & O'Sullivan, 1986; Griffin, 1981; MacDonald,

1990; Nicaise, Cogérino, Bois, & Amorose, 2006; Nicaise, Cogérino, Fairclough, Bois, & Davis, 2007), classroom teachers (Sadker, Sadker, & Zittleman, 2009; Vekiri & Chronaki, 2008), and parents (Crowley, Callanan, Tenenbaum, & Allen, 2001; Frome & Eccles, 1998; Jacobs, 1991; Tiedemann, 2000) provide more verbal and nonverbal interaction, more constructive criticism, and more appropriate praise to males than females and demonstrate higher expectations for males' abilities. These differential behaviors can profoundly enhance boys' and limit girls' learning; for example, constructive criticism from competent sources is a form of augmented feedback known to enhance the acquisition of motor skills (Magill, 1994). Although individuals can learn some skills using inherent sources of feedback, such as the senses (e.g., see an object fall short of a target and learn to throw it with more force), augmented feedback is helpful in learning complex skills and attaining higher levels of proficiency (e.g., learn to throw the object with optimum efficiency, power, consistency). When individuals attempt complex skills wherein they cannot discern their own errors and do not receive augmented feedback, their learning may be severely impaired (Schmidt, 1991). When girls err, they are less likely to receive such feedback and therefore to enhance their physical competency. Moreover, since corrective feedback following errors and praise following successes are known to bolster perceived competence (Allen & Howe, 1998), common socialization tendencies may affect girls' actual skills and confidence in their skills.

Girls' confidence in their abilities may be undermined by what some authors have referred to as "short-circuiting" of learning processes. In their compendium of more than three decades of research on gender inequities in schools, Sadker et al. (2009) provided numerous examples of ways that teachers "short-circuit" (p. 109) girls' learning by interrupting their efforts to accomplish tasks on their own. This is a form of sexism, though difficult for some to detect compared with blatant forms. The provision of excessive assistance to females by males is referred to as benevolent sexism because, although it appears caring and chivalrous, it nevertheless perpetuates notions of female incompetence and dependence on males (Becker & Wright, 2011; Dardenne, Dumont, & Bollier, 2007). When cloaked in affection, expressions of male dominance often go unrecognized as sexism by males and females, making them less likely to be challengedBarreto & Ellemers, 2005; Becker & Wright, 2011).

Although researchers have yet to specifically address its effects on motor development, benevolent sexism has been shown to raise

women's self-doubts about job competency, reduce their self-esteem, and undermine their actual performance more than hostile sexism (Dardenne et al., 2007). Unlike hostile sexism, which may inspire anger and motivation to perform, benevolent sexism may raise self-doubting and anxious thoughts, which can interfere with information processing and performance (Dardenne et al., 2007; Dumont, Sarlet, & Dardenne, 2010). In addition, since mastery experiences and verbal persuasion are major contributors to self-efficacy beliefs (Bandura, 1997), social influences that interfere with an individual's ability to perform a task or that raise self-doubt may also weaken self-efficacy. Benevolent sexism, during incidents such as the following, can insidiously impair girls' development of physical skills and self-efficacy, which may impact their future physical activity, fitness, and health. The following was recorded subsequent to the field observation of an exercise science intern:

> Today, I observed Dan leading a youth physical activity program at the YMCA. I was looking forward to the observation, as Dan is academically strong and has a great demeanor for working with kids. I watched Dan lead a small group of four to six year-olds through some warm-up and basketball activities. There were six boys and one girl. The girl was easily identifiable… in pink. I was initially entertained by the awkward, but active disarray, as the youngsters attempted to dribble mini basketballs and heave them towards mini hoops. However, I soon became very frustrated. First, while all of the boys were wearing lace-up athletic shoes, the girl wore slip-on shoes that repeatedly slipped off her heels, as she attempted to run and jump. Her movements were clearly impaired. Second, while they were dribbling, ALL of the children were losing ball control and having to chase down their basketballs. The only one for whom my student retrieved a ball was the little girl. Third, I watched one small boy miss a shot and then, during his next attempt, he squatted a little deeper, jumped a little higher, and projected his arms a little more forcefully. He still missed the basket, but he got closer. He improved. The little girl had no reason to try harder. As she was about to shoot her first shot, Dan hoisted her to the basket rim and allowed her to place the ball through the hoop. Let her try, Dan! If she misses, let her try again! Missing is a part of learning! Once again, a young girl was denied the opportunity (by a good student!)

> to try, fail, receive feedback, and improve skills that could enhance her future participation, and no one but me even noticed. (Mullins, 2010)

The ways that children are dressed greatly promote conformity to gender-stereotyped behavior. Boys are typically dressed to enable active play, whereas girls are often dressed in ways that limit physical activity and competency (Copeland, Sherman, Kendeigh, Saelens, & Kalkwarf, 2009; Norrish, Farringdon, Bulsara, & Hands, 2012; Oliver, Hamzah, & McCaughtry, 2009; Tauber, 1979). Girls are regularly outfitted in dresses, skirts, and fancy shoes, with inappropriate jewelry and painstakingly arranged hair. Albers (1998) showed that the way children are dressed can influence perceptions of appropriate behavior. She showed six photographs to 81 male and female children, aged 5 to 10 years old. Each photo depicted a male or a female child wearing masculine, feminine, or neutral clothing. The masculine outfits were characterized by navy blue, red, stripes, and baseball hats; the feminine ones by pink, ruffles, and flowers; and the neutral ones by the colors white, green, and yellow. Albers also showed the participants six cards, each bearing a black-and-white, gender-neutral silhouette of a child engaged in a specific play activity, and asked them to rank the activities according to what they thought would be the most to the least favorite of the individuals in the photographs. The participants responded in clear accordance with gender stereotypes, assuming that the favorites of the girl wearing the dress would be playing with the doll and cooking set and that the least favorite would involve the trucks and tools. They provided the opposite rankings for the male dressed in masculine attire and rankings reflecting more diverse interests (e.g., reading, working on a puzzle) for the male and female dressed in gender-neutral clothing. The implication is that the way children are dressed can communicate to them how they are supposed to behave. Dressing them elaborately and grooming them extensively communicates that they are to spend significant amounts of time sitting, primping, and staying clean. Spending little time dressing and grooming them communicates expectations to sit little and play much.

Although the primary purpose of this paper is to promote increased sensitivity to factors that limit girls' development, it is also important to recognize that the "over-blueing" of boys can limit their development. A young boy should not have to fear possible repercussions from wearing pink or taking ballet. Girls and boys

should be dressed in all colors and granted equal exposure to leisure, sports, artistic, academic, career, and domestic activities. They should be allowed to further explore activities that interest them as unique individuals and to fully express emotions that accompany their explorations. Stereotypes limit choice, individualism, and holistic development, and they perpetuate discrimination and the status quo. According to system justification theory, "…people are motivated not only to hold favorable attitudes toward themselves and toward members of their own groups (as other theories assume), but also to hold favorable attitudes toward the existing social system and the status quo" (Jost, Banaji, & Nosek, 2004, p. 912). In simple terms, since social systems establish social desirability, the way it is indicates the way it should be (Kay et al., 2009).

Summary: What Can Be Done?

Foremost, health professionals and laypeople alike can enhance awareness of gender-related conventions that may, in any way, undermine physical competency and health. Words, actions, and attitudes can be scrutinized for subtle potential to limit females' activity levels, as can gender traditions during role modeling, supporting, and reinforcing children's physical activity. Adults can address and help stop the perpetuation of phrases such as "You run like a girl." They can increase awareness of benevolent sexism and its abilities to limit females' skills, roles, competence, and self-esteem (Becker & Wright, 2011; Dardenne et al., 2007). Instead of giving excessive assistance to girls in their tasks, coaches, teachers, and parents can allow them to fail, persist, and accumulate mastery experiences that enhance self-efficacy (Bandura, 1997). When girls truly need help, adults can provide the same instructional detail that they would to boys. Adults can more carefully consider the toys they buy, chores they assign, clothes they provide, and activities they encourage for children. They can explain that boys and girls need to know how to cook, clean, and care for children and how to use tools, operate machines, and engage in a variety of physical activities. Instead of smothering girls with pink and boys with blue, they can provide all children with variety and grant them choice. These are relatively simple actions, but they may require mindful modification of existing habits. For every person who can more equitably promote physical activity among girls and boys, many more people will learn from them and contribute to widespread healthy change.

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MOVEMENT EDUCATION

Yoga for College Students: An Empowering Form of Movement and Connection

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Abstract

Yoga is a historic method for exercising, as well as cultivating a mind–body connection. For busy college students, it may be an effective way to slow down. The purpose of this study was to determine the impact of participating in a semiweekly yoga class at a university on college students' lives. Evidence of impact was measured through students' written responses to reflective questions about the semester-long yoga class, which was designed based on the traditional characteristics of yoga. Students enrolled in the class reported increased levels of relaxation, greater perspective of their lives, more focus, and feelings of empowerment. Given these important outcomes, the author advocates that more yoga classes at colleges and universities should be taught in the traditional way (i.e., with a foundation in yoga philosophy) to enable more students to discover these life-enriching benefits.

College students lead complex, busy lives. They no longer just enjoy their college days. Instead, many juggle full-time work and families along with their classes. As a professor of pedagogy and a certified yoga teacher, I designed and taught a yoga class based on

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the traditional aspects of yoga that resulted in students finding more peace of mind and presence in their lives. In this article, I explain how I designed and executed this class, as well as the impact it had on students' lives, as evidenced by their weekly journal reflections. I begin, however, with a brief description of the extant research on teaching yoga in schools and, in particular, higher education.

Literature Review

At the elementary school level, several studies have been conducted and programs have been described (e.g., Serwacki & Cook-Cottone, 2012; Williamson, 2012). These studies and descriptions have shown benefits of yoga for children, including fewer behavior problems, less test anxiety, and increased learning. Similarly, high school students reported positive psychological benefits from yoga sessions that were incorporated into their school PE program (Noggle, Steiner, Minami, & Khalsa, 2012). In another study, high school students showed better academic performance with yoga practice that included asana (poses), pranayama (breathing exercises), and meditation (Kauts & Sharma, 2009).

At the college level, Nowak and Hale (2012) reported that students had a strong interest in yoga; in fact, in one survey study, more than half of undergraduate students surveyed had tried yoga (Riley, Park, Marks, & Braun, 2012). These authors also reported that yoga participants tend to be female, Christian, and English speaking. Researchers who looked specifically at the effects of pranayama instruction found that perceived stress was reduced for undergraduate students (Sharma et al., 2013) and test anxiety was diminished for graduate students (Nemati, 2013). Helberg, Heyes, and Rohel (2009) described a cross-curricular course they created for upper level undergraduate philosophy students titled Thinking Through the Body: Philosophy and Yoga. This course met once weekly to discuss readings and once weekly to practice hatha yoga. They found that the components of the course were complementary; however, at the same time, they struggled with a disconnection between the two classes in that they occurred on separate days and in different spaces.

In related studies, researchers have investigated the effects of Mindfulness-Based Stress Reduction (MBSR) programs, of which yoga is a component. MBSR programs, as originally developed by Kabat-Zinn (1990), include the teaching of mindfulness through the practices of meditation, yoga, and body scanning. MBSR has been shown to reduce stress and anxiety for college students (New-

some, Waldo, & Gruszka, 2012; Oman, Shapiro, Thoresen, Plante, & Flinders, 2008; Shapiro, Oman, Thoresen, Plante, & Flinders, 2008), for generalized populations (Chiesa & Serretti, 2009; Grossman, Niemann, Schmidt, & Walach, 2004; Shapiro, Brown, Thoresen, & Plante, 2011), for particular groups such as health professionals (Martin-Asuero & Garcia-Banda, 2010), and for people with social anxiety (Koszycki, Benger, Shlik, & Bradwejn, 2007). The effects of MBSR programs incorporated into academic courses on college students have been studied. Bergen-Cico, Possemato, and Cheon (2013) reported general psychological benefits from a 5-week session of MBSR that was integrated into an undergraduate elective health course. Cohen and Miller (2009) investigated the effects of a 6-week interpersonal mindfulness training program on psychology and counseling graduate students. They found that students felt an increased sense of well-being because of the program and that the program could be a beneficial topic of study for future clinicians. Newsome, Christopher, Dahlen, and Christopher (2006) described a semester-long class titled Mind/Body Medicine and the Art of Self-Care that was created to help counseling students avoid burnout in their work. Their findings indicated that students learned how to better manage stress and improve their counseling practice.

To my knowledge, however, none of the studies on yoga in higher education consisted of yoga alone, targeted to a general undergraduate population and taught within a semester-long course. The purpose of this study was to fill this gap in the literature through investigating how undergraduates respond to a yoga class that draws upon traditional yoga philosophy. Although the number of colleges and universities with requirements for students to take physical education (PE) classes has decreased to almost 40% (Cardinal, Sorensen, & Cardinal, 2012), students who attend institutions that offer yoga as a choice in fulfilling that requirement or offer it as an elective could benefit greatly, particularly if the yoga class is taught in a traditional way (i.e., incorporates yoga philosophy and meditative aspects). Yoga has been shown to increase the quality of life for people who practice it regularly; specific benefits include muscular strength and flexibility, reduced stress and anxiety, improved sleep patterns, and enhanced overall well-being (Woodyard, 2011).

Method

In this section, a description of the course, demographics of the students who participated in the study, and procedures for data collection and analysis are provided.

Description of the Course

When I was asked to teach a section of yoga at my university, I thought of it not simply as teaching physical exercise, but as designing a curriculum commensurate with the traditional aspects of yoga tailored to meet the needs of college students. As a professor of pedagogy, I strive to plan meaningful learning experiences for students, and as a certified yoga teacher, I understand the importance of integrating yoga philosophy with physical practice. My approach to course design was based on constructivist principles; therefore, I sought to create a learning environment based on Jonassen's (1994) eight characteristics of constructivism. The characteristics most important to me were (a) multiple representations to avoid oversimplification and to represent the complexity of the real world, (b) emphasis on knowledge construction instead of knowledge reproduction, and (c) encouragement for thoughtful reflection on experience. I will further describe the ways in which I implemented these ideas next. Each component of the course structure was essential for my goal of student reflection and deeper learning about yoga.

My training in yoga encompassed more than 10 years of study and teaching, including a 200-hr teacher training with instructors who had an Ashtanga yoga background (as originally developed and taught by Pattabhi Jois in Mysore, India). The 200-hour program included emphasis on yoga philosophy (including required reading and discussion of *The Yoga Sutras of Patanjali* [Satchidananda, 1978/2009], *The Bhagavad Gita* [Easwaran, 1985/2007]*; Light on Life* [Iyengar, 2005]), Sanskrit, pranayama, meditation, anatomy, and teaching with hands-on adjustments. Subsequent to that program, I attended multiday teacher trainings in restorative yoga with Judith Hanson Lasater, alignment and philosophy with Donna Farhi, yoga nidra with Richard Miller, and breathing with Leslie Kaminoff. I am certified through Yoga Alliance at the 200-hr level as a vinyasa yoga teacher and have taught primarily slow, meditative vinyasa classes that are focused on pairing breath with movement and calming the mind.

Upon considering what was important to teach in a yoga class, I thought first of the eight limbs of yoga, as delineated by Patanjali in *The Yoga Sutra* (Satchidananda, 1978/2009). The eight limbs make up classical or traditional yoga. I wanted students to know more than just asanas (the poses) because in my own experience with yoga, the poses did not bring me deeper psychological benefits (e.g., calmness of mind) until I learned more about the classical yoga philosophy.

Even now, my physical practice continues to deepen as I learn more and reflect more on the eight limbs. Thus, these eight limbs were the foundation of the topics for the weekly agenda: yama (external restraints), niyama (internal restraints), asana (poses), pranayama (breathing), pratyahara (withdrawal of the senses), darana (concentration), dhyana (meditation), and samadhi (enlightenment). I also included other topics, including the types of yoga (Ashtanga, kundalini, yin, etc.), the history of yoga, and partner yoga. I used other references in course design, particularly in explaining yoga philosophy, including *The Yoga Tradition* (Feuerstein, 2008), *The Heart of Yoga* (Desikachar, 1995), and *Bringing Yoga to Life* (Farhi, 2003).

The class met twice a week for 1 hr 15 min each session. I began the first class of each week with a brief introduction and discussion of the topic for that week (types of yoga, history of yoga, yamas, niyamas, etc.); this portion of the class usually lasted 10 to 15 min. For the discussion part, I usually read short articles from *Yoga Journal* and miscellaneous online resources, which contained detailed explanations of the topic of the week. Consistent with Jonassen's (1994) characteristic of a constructivist learning environment, I sought to provide multiple representations of concepts, including conflicting ideas, to represent complexity of the real world of yoga. For example, when I discussed the types of yoga, I included aspects such as diet, poses, and meditation used in each. I led group yoga practices during each class meeting for about 1 hr; these practices included vinyasa, hatha, kundalini, and yin yoga, and I often incorporated student requests for areas of focus (e.g., shoulders, hips, core, balance, inversions). Attendance and participation in the classes comprised 60% of students' grades.

At the end of every week, students were required to answer reflective journal questions on Blackboard (an online learning management system). The purpose of these questions was to help students consider at a deeper level the topics discussed in class, as well as the ways in which yoga has had an influence on their lives. My intention was to encourage thoughtful reflection on experience (Jonassen, 1994). I graded these journal entries as a completion grade; therefore, if students participated, they received the points. This component of the course was 20% of the overall grade. The 13 reflective journal questions are listed in Table 1; four of them were used as the data on which the results of the current study are based.

Table 1
List of Weekly Reflection Questions

1.	Describe your thoughts about the first group practice. How was it different than you expected? How was it different than what you've done before?
2.	In class this week, we talked about some of the types of yoga, but there are many other types. Do a little brief research on other types of yoga and describe them. Which ones sound most interesting to you and why?
3.	In your own words, explain the history of yoga. (If needed, read a little more about it on the Internet, but write in your own words.) How does is it different from what you previously thought?
4.	What is your favorite aspect of yoga? How has it influenced your life so far?
5.	In your own words, describe yoga philosophy, as well as an area or idea about which you would like to learn more.
6.	How do the yamas and niyamas relate to the values that you already hold? Do you see yourself incorporating the yamas and niyamas into your approach to life? If so, in what ways? Give examples.
7.	Describe the outside yoga class that you took, including the name of the instructor and class. How was it different from our class?
8.	How has your breathing (in general) changed as a result of this yoga class? What is your favorite pranayama?
9.	Describe your feelings about partner yoga.
10.	How can you engage more pratyahara in your life?
11.	Up to this point, how have your shared the yoga you've learned? How else could you share it with others?
12.	How has yoga impacted your concentration?
13.	How has your yoga practice changed since the first day of class? How do you plan to continue your yoga practice after this semester?

Note. Questions 1, 4, 8, and 12 analyzed for current study.

In the course structure, I also included two projects, each worth 10% of the class grade: (a) a 5-min presentation on any aspect of yoga and (b) a 30-min personal practice to be demonstrated during the last class meeting. Consistent with the tenets of a constructivist learning environment, I designed these projects with the goal of providing students a way to construct knowledge rather than reproduce it (Jonassen, 1994). My purpose for the first project was that I wanted students to do brief research on an aspect of yoga so they would see how much information is available about it, as well as for them to learn more than what I presented in class. Considering that the course was a PE class and not an academic class, I did not expect a lot of depth. However, I wanted students to find interesting information to add to their and other students' understanding about yoga. I allowed the students to choose their topic; some students chose

to research and present about information I had mentioned in class (e.g., a type of yoga), and others chose new topics (e.g., chakras). Although these projects did not have an effect on the data collected for this study, they added to the students' understanding of yoga and were an important part of the course structure.

For the second project, the development of a personal practice, I wanted students to have written information they could use to continue their yoga practice after the end of the semester. I did not require a specific format, although I did encourage students to indicate the amount of time they would practice each pose or series; some students wrote the poses in a list, and others cut out pictures of poses or drew them. I encouraged them to develop their personal practice based on what would be safe and helpful for their bodies and lives, as well as a routine they would actually perform; therefore, some included more yin yoga (a slower, meditative style of holding poses for 3 to 5 min), and others included more vinyasa or kundalini (more active styles of yoga).

During the three semesters of the study, I needed to be away from the university for at least one class meeting due to attendance at conferences. To replace this missed class, I asked students to complete an outside practice. I thought this would be good for them so (a) they would experience variety in approaches to teaching yoga and (b) they would find a place to do yoga outside of class on a regular basis if they chose (i.e., local gym or yoga studio, student recreational center, or online class such as on www.yogatoday.com or www.youtube.com). All students followed this requirement and wrote about their experience in their reflective journal entry for that week.

Participants

The participants for this study were students enrolled in the yoga PE class that was offered at a regional, public 4-year university in southeast Texas. Over 14,000 students were enrolled at the university, of which 68% were undergraduate students. One PE class was a requirement of the university to meet the core curriculum guidelines. Over 50% of the students who registered for PE classes at the university were freshmen or sophomores; the percentage was similar for the students who chose to take yoga to fulfill their requirement. In addition, many students took the class as an elective.

This study spanned 3 semesters (Fall 2010, Spring 2011, and Fall 2011). Enrollment in the course each semester was limited by

administration to 20 students. Of the 60 students who took the classes, all except five students were traditionally aged students, between 18 and 22 years; the other five students were between ages 24 and 30. All the students were female except for two males the first semester and one male the second semester.

I did not initially intend to study the students' responses to the course, but as the deep impact became apparent to me midway through the semester, I submitted a proposal to the institutional review board for the current study. Therefore, I did not inform the first group of students about the study until the end of the semester. At that time, I told them about my idea of writing about how the course had had an impact on their lives, and I distributed consent forms. They were given the option to have their information withheld; however, no student chose this option. The consent forms, as well as my oral explanation, made it clear that they could withdraw from the study at any time and with no consequences for the class and that their ideas and responses would be used anonymously. To keep the subsequent semesters similar in terms of methodology protocols, I did not discuss the study until the end of each semester. In addition, my intent was for students to answer the weekly reflective questions freely and not feel as though they were being studied.

Data Sources and Analysis

Data for describing students' reactions to the yoga class came from responses to four of the Blackboard journal questions that had insightful and/or particularly reflective comments. Students responded to 13 questions throughout the 15-week semester, one for each week of class; this number excluded the week of Thanksgiving (for fall semesters), Easter (for the spring semester), and the final week of class. I designed the questions to encourage the students to reflect deeper on their experiences with the yoga practice and on important ideas discussed in class. Students' responses to each question ranged from 100 words to 300 words. All journal questions are shown in Table 1 in the order posed, with the questions used in this study noted.

Responses included those of students who took the class in one of three subsequent semesters (Fall 2010, Spring 2011, and Fall 2011). I taught the class in the same way each time, and the weekly Blackboard questions were the same each semester. I saved students' responses from Blackboard and removed all names to ensure confidentiality in the data. I analyzed the data using NVivo qualitative

data analysis software (QSR NVivo version 9.2). I analyzed the responses qualitatively, as described by Merriam (1998), and used the constant comparative method of theme generation to generate codes (Glaser & Strauss, 1967). Themes are listed in the Results section in order of highest number of data segments that were identified, so the most common response or idea is listed as the first theme (Miles & Huberman, 1994).

I compiled and analyzed the data from the three semesters about 6 months after the third semester. I found no notable differences in student responses over the 3 semesters. Although some bias in analysis may exist, I sought to reduce it by (1) analyzing the data in an anonymous format, (2) using NVivo software, and (3) doing so months after the last course. Potential biases are discussed further in the limitations section of the Discussion section.

Results

The four reflection questions that were chosen for data analysis included the following:

1. Describe your thoughts about the first group practice. How was it different than you expected? How was it different than what you've done before? (Posed at the end of the 1st week)
2. What is your favorite aspect of yoga? How has it influenced your life so far? (Posed at the end of the 4th week)
3. How has your breathing (in general) changed as a result of this yoga class? What is your favorite pranayama? (Posed at the end of the 8th week)
4. How has yoga impacted your concentration? (Posed at the end of the 12th week)

I analyzed responses to each question as a group and then combined the data from the most common themes across the groups (Miles & Huberman, 1994). The themes that emerged from students' responses were (a) calming, (b) perspective, (c) focus, and (d) empowerment.

Calming

Feeling more relaxed and calm was the most frequent response to all of the analyzed reflection questions. Many students noticed this difference after the first class, indicating they felt calmer throughout the whole practice; for example, one student commented, "The entire experience was extremely calming and allowed for self-re-

flection." Others particularly enjoyed the final savasana (relaxation pose): "The last five minutes where we just laid there and focused on breathing and letting everything else go was the most relaxing five minutes I have ever had." One student noted particular movements that were beneficial: "I was surprised at how relaxing just a few simple moves could be, like deflating my tongue or breathing from my belly instead of just my lungs." Other students noted the calming effect after class was over:

> I believe yoga must be good for the mind and body because I felt really great after I left class. It's a feeling I'd have to say I never felt before. I realized that I felt more relaxed, and definitely more flexible. The breathing aspect of yoga was interesting as well. I felt as though it relieved my stress.

The calming effects that students noticed persisted throughout the semester. In response to the question about their favorite aspects of yoga, one student wrote, "My favorite aspect of yoga is the relaxation. I like the feeling of being at peace with oneself. I feel I needed this type of serenity in my life, especially being so busy and stressed all the time." Other students commented:

> After yoga practices, I feel extremely calm and at peace with everything. Even for the rest of the day I find myself breathing deeper and feeling more calm, rather than stressed as usual, and that is the biggest way it has impacted my life.

> My favorite aspect of yoga is the fact that it is calming. No matter how awful my day has been or my week, it is the one class I can come into feeling stressed and come out feeling completely relaxed. It seems to calm my nerves quite a bit and help make life a lot less stressful.

This theme was also the most often cited in response to how yoga had influenced their lives. Students commented, "Yoga helps me calm down when I am upset or disheveled. Even when I think about practicing yoga, it calms my mind" and "I've learned how to relax my mind at all times—it makes such a positive difference in how I live my day to day life." Another poignant response about the influence of yoga on a student's life was the following:

> Prior to practicing yoga, I was very stressed out all the time with school and life in general and I had horrible sleep pat-

terns. Now, I'm still stressed with school and life, but I know how to keep calm by breathing and analyzing what's stressing me out and working toward de-stressing my life. Recently, I've had a very hard and rough two weeks and yoga has helped me by relaxing and taking my mind off things and to just let the things I don't need to worry about pass by like clouds. If I didn't know the things I do with yoga then I would've been a train wreck.

Similarly, another student wrote, "I am less stressed about a lot of things—I tend to let things just blow over instead of becoming upset about them."

The most often cited way in which students' breath changed was in terms of helping them be more relaxed and calm. For example, one student wrote, "I have learned that when I am worried, stressed, or angry that I can concentrate on my breathing and it helps to calm me." Another student wrote,

> Something I didn't realize until I took yoga was how important the actual way you breath is. Sometimes for yourself you have to just stop and focus on nothing but your breathing. It's not only healthy, it's calming and gets you back on a more focused state of mind.

Other students commented, "If I'm having trouble sleeping or I'm really frustrated then I try the same breathing technique used in class to help me relax and gain a peaceful mind state," "I think it really helped me to control my breathing and ultimately helped me relieve my high anxiety life style especially working full time and going to school full time," and "Usually the breaths that I take are short and fast almost like I'm constantly panicking. Recently however they have been more from my diaphragm and I am more calm."

Several students commented about how they relaxed easier due to their improved concentration. One student described, "Yoga has impacted my concentration by helping me to take a step back, relax, and actually focus on whatever I am doing." Another student wrote,

> It has helped me in concentration with my day-to-day activities, school, and at home with my family. An analogy that I can use to describe myself before yoga is a bee. Just always running from one thing to another, never taking the time to slow down and really think about what I was doing, or needing to do. I just zoomed through everything as fast as I could

> so that I could get the next thing on my list accomplished. I no longer do that. If I catch myself falling back into this routine, I take a step back, take a deep breath, and slow down. I never thought that yoga would have such an impact on my life, in every area of my life.

Other students commented, "Yoga has improved my concentration not only in school but in daily life and that's what I find most amazing about yoga" and "Really my yoga practice has impacted my life for the better; I am more calm and collected, and I concentrate more, and I am way less stressed."

Perspective

During the semester, the second most common theme in the reflection question responses was about gaining a wider perspective of what is most important in life. For example, students commented,

> Yoga has also influenced me to keep everything in perspective. I am usually very high strung and always worrying about things that I don't really have control over, but yoga is helping me to let the less important things go.

> Throughout the semester, the main thing I have taken from this yoga class is a more noticeable concentration on being in the present moment. When I get caught up in my daily schedule and things get hectic, yoga has taught me to stop and concentrate on where I'm at and what I'm doing.

> Practicing Yoga has been a great addition in my life. During my practice, I get the chance to clear my mind and look at the things that are not changing. Having that quiet time to focus on what is important, and not just the everyday stressors, is very helpful to me. It is a good way to put things in perspective. I would definitely recommend practicing Yoga to anyone.

Many students also wrote about focusing on the most important aspects of their lives. For example, students commented, "Yoga to me pulls your mind to concentrate on the more important areas of life" and "Yoga eases my mind and helps me to focus on more important things than just the day-to-day hustle and tasks." Another student noted,

> Yoga has also influenced me to keep everything in perspective. I am usually very high strung and always worrying about things that I don't really have control over, but yoga is helping me to let the less important things go.

Another common area of increased perspective was learning how to be present in the moment. Students stated,

> Since I've been in this class, if at any point during my day I feel overwhelmed, rushed, aggravated, etc., I stop and take a couple deep breaths, concentrating on where I am and my breathing, and it always helps me bring the situation into focus. This tactic always brings me back to the present and allows me to focus on what is happening in that moment.

> Like what is said in class, "let your thoughts go by like clouds," I try to use this and simply focus on what is important to me in that moment and not all the other things that I don't need to worry about right then and there.

Some students wrote about how focusing on their breath helped them keep the events in their lives in perspective. For example, one student noted, "Especially when I am feeling stressed out, I breathe more deeply and just try to focus on that instead of whatever I am stressing about, which definitely helps with controlling my stress." Other students wrote,

> When I find myself in a very hectic complication and am constantly worrying, I tend to catch myself before I break down and just breathe. As I am breathing, it makes me think about how lucky I am to be alive and just really give thanks.

> Throughout the semester, the main thing I have taken from this yoga class is a more noticeable concentration on being in the present moment. When I get caught up in my daily schedule and things get hectic, yoga has taught me to stop and concentrate on where I'm at and what I'm doing. I am able to focus on my breathing and remind myself that if I'm not mentally present, I'll miss out on opportunities. I always get caught up in thinking about the past or planning for the future that sometimes I forget to enjoy the present.

Focus

Many students enjoyed the increased level of focus during and after the practice. One student stated, "I wasn't thinking much about anything other than my own movements and control of my breathing. I completely forgot about anything and everything outside of the confines of the room." Another student wrote, "I really liked the feeling of calmness and the level of concentration that it brought on whenever practice was over."

Students also noted that their increased focus that started during the yoga practices was having an effect on other aspects of their lives. For example, students made the following noteworthy comments:

> My favorite aspect of them all is FOCUS. My spirit is always focused on the present during practice. My mind is in one place. Normally, my mind is boggling with due dates, homework, personal issues and work. My schedule is always booked. Although my hectic schedule has not changed, I have learned how to stop and focus on one thing at a time. As soon as I catch myself spinning around the room, I pause. I breathe in deep and release and prioritize my thoughts. I do exactly what you described in class: The Cloud Analogy. I acknowledge all my thoughts as they float by and get back to them when I can. Focus is really important in life.

> I would have to say my favorite aspect of yoga is the focusing aspect in yoga. I only focus on yoga when I am practicing. I just forget about everything outside of yoga, but when I practice yoga I focus on all of the details of yoga during my practice. I focus on every little detail, like that I am making sure that I am breathing right, or that I make sure my fingers are spread apart and that I am rooting down with my hands when I am in downward facing dog, or that my back is straight. When I focus really hard during my yoga practice, I feel like I am getting the most of the practice and it makes me feel like I did the best practice I could do that day. Being so focused when I practice yoga has helped me be more focused when I do everything else.

Other students wrote, "To stay in those positions and keep the mind clear of thoughts was hard, but this helps me in my tennis,

school, and life by improving my concentration and be able to live in the 'Here and Now,'" and "I have found that yoga has really been helping me focus more in my other classes as well as in everyday life."

In particular, many students noted the effect of the yoga practice on their ability to focus on their schoolwork:

> Before regularly practicing yoga, I also had a hard time paying attention in class. I would allow my mind to wander when I needed to be studying, doing work, or just paying attention, but somehow from practicing yoga regularly I have been able to find a way to become more attentive during class lectures and in my everyday studying and work.

> Being so focused when I practice yoga has helped me be more focused when I do everything else. I used to have a really bad procrastination problem, and now I've been getting most of my work done earlier. Also I noticed I have been doing a better job on whatever I am doing. If I am studying for a test I can study the same amount of time I would have before I started practicing yoga, but I retain more information now than I would have before I started practicing yoga. I also had a problem with remembering people's names, but now I can remember most people's names when I first meet. And because I am more focused now I get my stuff done sooner, so I am less stressed.

> I used to study only in my room where there are distractions and it used to take me hours to study for my classes. Now that I'm doing yoga I find myself actually going to the library and focus better on my work. Doing this helps me get done with my studying earlier. When I read over material for classes, I'm so focused that I am able to read it fast and at the same time comprehend it the first time. So now I spend like two hours and a half for all classes I'm in together.

Many students also commented on an increased ability to focus on one task at a time:

> Since I've started practicing yoga, I can see a difference in my concentration. I would normally find it hard to only focus on one thing. I can be very scattered in my thoughts, es-

pecially when it comes to school work. But now I can handle my assignments with no distraction from myself.

When I first signed up for yoga, my attention span was next to none. It was hard for me to focus on just one thing at a time. I have always been scatterbrained; my mind is always racing full speed ahead, never really settling on one thought. I guess that changed due to the fact that yoga requires for me to focus on one thing at a time. I guess with me actually focusing on the practice every class, my attention span has gotten stronger; I don't daydream as much anymore. I can actually sit and concentrate on just one thought and not get anxious. It is easier for me to know what I have to do during the day and after classes because my mind is not roaming as much as it used to.

Also at work I often get very busy and have a million things to do at once, and since I have been practicing yoga, whenever we start to get busy, I stop and take a few deep breaths and really try to concentrate on every single thing that I am doing individually, and I have found that I end up making way less mistakes when I do this.

Empowerment

Students realized that they could gain more control over their thoughts and lives through an intentional yoga practice and quieter mind. For example, one student wrote, "This course has taught me how I can be aware of things and thoughts around me but not let them affect my thought process." Another student described,

I've become more aware of everything around me, and when there are distractions around me, I block them out while I work on what needs to be done right away. And because I concentrate hard on my objectives, I have more free time to do what I like. I also do not procrastinate as much anymore. I get my work and projects done for my class right away. Also, I have become a better driver. I pay way more attention when I drive now. My friends used to not like to ride with me when I drove my car because they were scared of the way I drive.

> Now they have seen I concentrate more when I drive and they are less scared to ride with me.

Many students realized that by learning how to better access their breathing capacities and increase their levels of concentration, they could have more control over certain aspects of their lives. For example, with respect to the beneficial effects of intentional breathing, students wrote,

> I think that the breathing exercises are very liberating in the sense that you have the ability to control the aspect you need to live. I always just assumed that you just breathed to live, but by altering the pattern, you are able to feel so many different emotions.

> Since yoga, I have focused more on my breathing and feel like I'm more in control of my breath. All before, I was never really aware of my breathing, but now I'm more attentive and focused on each breath that I take. Breathing better has helped to obtain more energy and relieve stress.

Another student stated, "My breathing has been much better due to yoga. I have learned how to breath for certain results. Like if I want to be more relaxed, I know to breathe out more than I breathe in."

Students also commented on their new abilities to concentrate better:

> Another way yoga has impacted my concentration is when we sit at the beginning of class and focus on what we're about to do. It makes tasks much easier to accomplish when I take a few moments at the start and set intentions and really focus on doing my best.

> I do get stressed out and I have the feeling of wanting to quit sometimes when I should be doing homework or studying. Now I have the drive to concentrate on what I need to get done and relax afterwards instead of resting every other minute while I'm trying to get my studies done.

A related idea is the health benefits that students could activate themselves. For example, students noted, "My favorite aspect of

yoga is its healing benefits. How it has the power to heal a person mentally and physically without medication just amazes me," and "Yoga by far has been the one exercise that actually makes me feel better about myself every time I do it." Another student wrote,

> Since learning the pranayama, my asthma hasn't been bad. I do still have a shortness of breath, but it lasts for two minutes maximum. Knowing the different breathing techniques has helped me out a lot in the few weeks of learning them. I now have a choice of which pranayama to use and if my first choice doesn't help me then I can try out the other ones. Walking to the...parking lot I no longer have shortness of breath.

One student commented about increased self-knowledge, also supporting the idea of increased empowerment:

> I came into this class thinking that yoga was no more than an easy PE credit that would be highly appreciated. But these past couple of weeks, it has been more than that. I have found out more about myself than I have the whole twenty-one years that I have been living.

Discussion

Students' responses indicate yoga may be a powerful force for helping students deal with their complex, busy lives. Students noted the myriad of ways in which the yoga practice brought deep benefits to their lives; echoing many of those reported benefits, one student commented:

> I never realized that taking one class at [University] could impact my life so much. Participating and learning about yoga, I feel, has had a significant impact in my life outside of the classroom. I find that nowadays I have an overall more meditative sense of life while operating through daily routines. I can channel my breath while lying down to sleep at night. I can think about the calming sense behind the practice to help me get through my homework at the end of a stressful day. In most cases, I can reflect back to my focus in a practice to calm me down or help me make the best of a bad situation.

The primary themes from the reflective journals were (a) calming, (b) perspective, (c) focus, and (d) empowerment. None of these themes were particularly surprising, but each is important to the benefits of a regular yoga practice for college students. The first three themes are qualities that may help undergraduate students better cope with their lives, and the fourth theme, empowerment, is a way for students to gain more control over their lives.

Because college students are typically busy, finding time and a way to relax is essential. Yoga is a commonsense outlet, given that it is viewed as a relaxing activity (Lasater, 1999). The outcome of this study that students found yoga to be calming is consistent with previous studies in which stress reduction benefits were found for participants (Newsome et al., 2012; Oman et al., 2008; Shapiro et al., 2008; Sharma et al., 2013).

Through the process of understanding yoga, students reported they were able to develop more perspective on their lives and not get caught up in each situation or problem. Indeed, Strom (2010) asserted that through practicing yoga, people are able to connect with their inner selves and unite their mind, body, and soul, so an increased perspective is a common outcome (Lasater, 1999). This resulting theme of perspective was not found in the published studies on yoga or MBSR; perhaps this was because in most of those studies, benefits were measured based on psychological scales, such as perceived stress or mood states, whereas in the current study, students reported their perceived benefits through open-ended questions.

Practiced correctly, with intention as well as attention to the breath, yoga requires a fair amount of focus. The focus used on the mat can also become apparent off the mat in daily life (Strom, 2010). Obviously, an increased focus in daily life may be a valuable asset to students, particularly with respect to their classes and studying. This outcome is comparable to studies in which students noted increased academic performance (e.g., Kauts & Sharma, 2009).

The fourth theme, empowerment, is a result of the impact the other three themes had on students' lives. Students found that the knowledge and ability to enact ways of breathing and moving to have a desired effect on thinking was empowering. In fact, finding this power over one's life is important to maturing and moving into the role of an adult (Maslow, 1999). Yoga practitioners have written about and experienced empowerment through yoga for hundreds of years; however, for individuals who experience increased empowerment, it may be life altering (Wood, 2004). Yoga is an effective way

for people to obtain this control and insight into their lives (Cope, 1999). For college students, in particular, these benefits may have a profound influence on their lives. Similar to the outcome of perspective, this theme of empowerment was not reported in the extant literature; once again, perhaps that is due to the difference in data sources, as open-ended questions were used in this study.

Although students reported numerous benefits from this yoga class, there are several limitations to this study. Above all, it was a small-scale study of only one design taught by the same instructor, and yoga styles and types of instruction were not compared. Therefore, the type of yoga taught and the way in which it was taught could have been a bias. In addition, the same person designed and studied the course, so the results could be biased. I encouraged students to be honest in what they wrote in response to the weekly reflection questions, and I made it clear that I would be grading based on completion, not based on what they wrote and whether they agreed with my perspectives or teaching style. Also, because I wanted students to discover and reflect for themselves, I was careful throughout the class not to expound on the benefits I had personally gained from yoga practice. The results could also have been biased based on the majority of females in the classes and that a female instructor taught the course. Finally, although I took measures to prevent it (anonymous data, used NVivo, etc.), the analysis could have been biased because I was a solo researcher and not part of a team.

Despite the limitations and potential biases of the study, the results may be used to inform the design of yoga courses within PE departments. Indeed, if college students can experience some of the benefits reported in this study, they may find a calmer way of approaching their lives, with more perspective on the important aspects and more focus on their academic work. As a result, similar to the students in this study, they may become more empowered and thus feel a greater sense of control in their lives. Therefore, I advocate that comparably designed yoga course should be offered at colleges and universities to students, whether or not it is part of a PE requirement.

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PEDAGOGY

Authentic Assessment in Physical Education: A Case Study of Game Sense Pedagogy

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Abstract

The use and promotion of the term authentic assessment *(AA) in the literature and among physical education (PE) practitioners is widespread. However, the meaning and application of this concept are misunderstood, in education generally, in its application to PE, and in its application to specific pedagogical approaches within PE, such as Game Sense. The purpose for writing this two-part paper was to clarify the term* AA *and provide insight into the challenges for such assessment in Game Sense pedagogy. In part one, we provide a conceptual and theoretical background to AA, drawing on a model from higher education to clarify key characteristics. In doing so, we outline why the term is problematic in PE. In part two, we draw on interviews with practicing PE teachers to highlight the issues in Game Sense assessment from their perspective, and we present strategies to address those issues.*

In Australia, with the impending introduction of the National Curriculum in 2015, there has been increasing pressure for officials in key learning areas to justify the inclusion of their topic; this presents challenges for the position of physical education (PE) within

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schools. Advocates of the Australian National Curriculum seek to align the previously disparate state curricula and focus on developing national literacy and numeracy. Subsequently, curriculum areas that are not clearly linked to improving these domains have been marginalized, with teaching time and allocated resources being reduced. Due to the concurrent focus on national assessment of literacy and numeracy, deficiencies in PE assessment have been highlighted, and few researchers have addressed issues regarding assessment in PE. In particular, there are concerns about valid and authentic forms of assessment for learning. In this paper, we specifically address authentic assessment (AA) issues associated with Game Sense pedagogy in PE and highlight that even though this pedagogy has been reconginized in the academic literature and adopted in the practical setting, research based on practical aspects of its application, such as assessment, is still needed. Although specifically addressing Game Sense and AA in this paper, we argue that, in general, PE assessment reform needs to be implemented in line with contemporary global education theory and practice.

Since the mid-1990s, researchers have acknowledged AA as an area for reform in PE (Hay, 2006; Kirk, MacDonald, & Sullivan, 2006; Penney, Brooker, Hay, & Gillespie, 2009; Smith & Cestaro, 1998; Welk, 2008) and more specifically as a rational approach to contextual, games-based pedagogies, such as Game Sense (Gréhaigne, Godbout, & Bouthier, 2001; Oslin, Mitchell, & Griffin, 1998). However, the lack of discussion of AA in the PE literature is notable.

This neglect of AA is not surprising. Hay and Penney (2009) pointed out that general discussion regarding assessment in this field is lacking. They presented a model for efficacy in PE assessment that includes (a) a primary focus on assessment for learning, (b) AA, (c) assurance of validity, and (d) socially just approaches to assessment. They contributed substantially to the clarity of understanding in this area. They also listed AA as a key criterion for efficacious assessment. However, researchers need to further expound and clarify the role of AA if it is to continue to be promoted as a critical, if not the central, characteristic of models of best practice in this field. Furthermore, as we will demonstrate through our exploration of this term, high-quality AA is challenging to practitioners as it has not been explained in the literature to date. Authors who refer to AA in research literature and PE texts today tend to make only superficial references to the concept and, perhaps because the characteristics of

AA have not been clearly expounded, fail to provide concrete examples of AA that are needed for teacher professional development and professional practice.

However, this problem is not limited to PE. More broadly in education literature the term *AA* continues to be adopted and applied, and a database search of the term would result in several definitional positions. We acknowledge these positions in this paper; however, to be pragmatic, we ultimately present one recent and informed definition and its conceptual framework as a means of exploring AA and the underlying theoretical assessment issues. We go on to consider teachers' accounts of assessment in Game Sense with reference to the conceptual framework and discuss how they can meet the challenges of AA effectively. We analyze current practice against a model based on Gulikers, Bastiaens, and Kirschner's (2004) five-dimensional framework for AA. Therefore, this paper is a critical case study of physical education AA, specifically an investigation into Game Sense assessment in the Australian school setting with interviews of 17 practicing teachers.

Literature Review

Assessment has recently been pivotal in broad education reform, and it has been acknowledged that in the fields of physical education, school sport, and community sport, assessment issues are not center stage. Only a couple of years ago, Penney et al. (2009) noted, "Given the recognition within mainstream education literature of the inter-dependence of curriculum, pedagogy and assessment, the relative dearth of assessment literature in P.E. is both somewhat surprising and a concern" (p. 434). The lack of emphasis on assessment in PE was first noted almost 15 years ago by MacDonald and Brooker (1997), who advocated for "the need for assessment programmes and practices to be underpinned by fairness and equity principles, and for teacher judgements about student performance to be comparable within and across schools" (p. 84). Despite this deficit, the term *AA* has been widely adopted and presented as the mantra in this field. Authors in recent texts have advocated the use of AA (e.g., Meldrum & Peters, 2012).

What Is Authentic Assessment?

Many definitions of AA are presented in the academic literature; all (Cumming & Mawell, 1999; Hart, 1994; Lund, 1997) agree that AA is the use of real-life, or authentic, tasks and contexts and multiple methods of assessment. However, Gulikers et al. (2004) noted,

> Increasing the authenticity of an assessment is expected to have a positive influence on student learning and motivation... Authenticity, however, is only vaguely described dimension of assessment, because it is thought to be a familiar and generally known concept that needs no explicit defining. (p. 68)

The lack of explicit description has led to confusion, and there is also a surprising lack of exemplars to clarify the situation of PE assessment in an Australian educational context. We are in agreement with Swaffield (2011), who sees authentic as equivalent to genuine (p. 434). Hay and Penney (2009) described AA as assessment that "pursues tasks and foci that are meaningful to students and that have value and meaning beyond the instructional context" (p. 394). However, there is a substantial leap between acknowledging the relevance of AA and being able to implement or formulate an AA task. We believe the term needs to be further articulated and exemplified as well as examined in relation to the practical perspectives of teachers.

Gulikers et al. (2004) reviewed the literature on AA and presented a five-dimensional framework for developing AA tasks. This is shown in Figure 1. These authors validated their model against the perceptions of students and teachers in a nursing college. In this paper, we use their model as a benchmark to examine teachers' current self-reported practices in Game Sense assessment.

A Model of Authentic Assessment

Gulikers et al. (2004) presented a five-dimensional framework for AA. Four dimensions are about the nature of the assessment activity and the fifth dimension is about the assessment criteria, which sit beside the assessment activity but are pivotal in determining the quality and educational value of the activity. For AA, the assessment criteria must be based on activities and skills that relate to real-life experiences (outside the formal educational setting). The competencies required for these activities must be explicit, transparent, and communicated to students before the assessment activity. Furthermore, criterion- or standards-referenced scoring should be used so students receive a "profile" of their competencies of what they have and have not achieved, not simply a total mark.

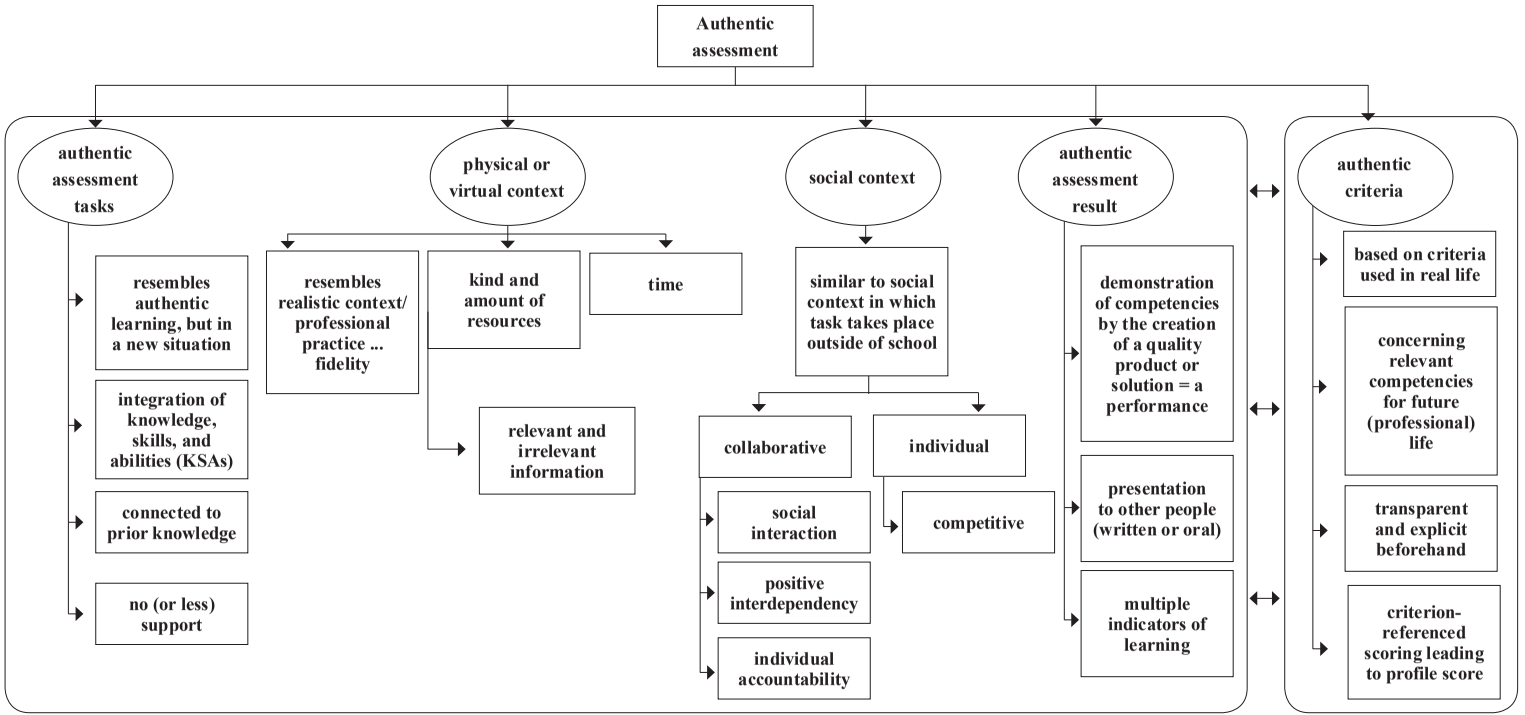

Figure 1. From "A Five Dimensional Framework for Authentic Assessment," by J. Gulikers, T. Bastiaens, and P. Kirschner, 2004, *Educational Technology Research and Development, 52*(3), p. 73.

The setting of appropriate authentic criteria is one challenge in making PE assessment authentic. This requires teachers to think about how the skills they are teaching relate to the world beyond the school setting. Current practice with drill and skill assessment involving measurement of isolated physical skills, for example, cannot be established as authentic because it holds little relevance for most students' lives beyond school. However, assessment through which students improve through personal goal setting and training is more authentic.

Once teachers decide on the appropriate criteria, they need to develop the task. According to Gulikers et al. (2004), for assessment to be authentic, teachers must present the task in a new situation, with no, or minimal, support. This is the ultimate test of the learning outcomes because students are required to transfer what they learn, as it is anticipated they will need to transfer all school learning beyond the school; this is a critical feature of AA. Furthermore, for assessment to be authentic, students must integrate knowledge, skills, and attitudes and thus will need to build upon their existing learning. Meeting these criteria in professional and technical/vocational education is not easy. To develop AA tasks for PE, teachers need to ask, how do the knowledge, skills, and attitudes learned in class relate to contexts beyond the classroom and possibly beyond physical activity?

Gulikers et al. (2004) also provided details on developing tasks in physical contexts, in social contexts, and in relation to how learners understand the task and its assessment results. In some fields, development of authentic physical contexts involves simulation. However, in PE it may require developing a context that resembles social-competitive sports environments seen in the greater world. In terms of authentic social contexts, learning outside of school mostly occurs within social systems, so teachers need to pay attention to this dimension when using AA. In Game Sense PE, for example, teachers may use AA to evaluate teamwork, communication, and other social aspects of tasks.

What Is Game Sense?

Researchers have highlighted that while using traditional skill- and drill-based approaches to teaching, PE teachers have excluded and marginalized student who are less skilled and less confident (Light, 2013). In response to this, Bunker and Thorpe (1982) proposed Teaching Games for Understanding (TGfU) as an alternative to traditional skill-led approaches to games and sports teaching. In

Australia, TGfU is known as Game Sense, and throughout this paper, the term *Game Sense* will be used.

In the traditional drill and skill approach, students are introduced to the key skills they need to master before playing the game. For example, students learn the skills of dribbling, passing, and shooting before they play basketball. The curriculum is focused on students learning the skills of the sport in an isolated manner, and teachers model the correct way of executing the skill. There are a number of problems with the skill and drill approach and these include the skill development occurs out of the context of the game; the approach does not consider the complexity of learning; the approach lacks meaning and relevance to students, especially those who have never seen the sport; the approach lacks social aspects of sports; the approach is a teacher-centered pedagogy; and skill does not always transfer into the game (Light, 2013).

In the Game Sense approach, individuals learn within the context of the game and teachers employ questioning instead of direct instruction. All learning occurs in the game situation, and the highlights of learning are intellectual and social aspects of games such as awareness and technical understanding, cognitive and affective development, and immediate involvement in games, which is motivating for students (Light, 2008; Light, 2013).

The adoption of Game Sense has repercussions for the teacher. The teacher becomes the facilitator of learning who provides opportunities for learning; the approach is student-centered, with an emphasis on active engagement in learning, at individual and group levels. Students solve problems in small, modified games and ask questions. They receive consistent feedback and their own knowledge is valued; moreover, they are encouraged to have equitable relationships and be creative, cooperative, and collaborative.

In Game Sense, teachers introduce the students to the sport through a progressive sequence of modified small-sided games to provide opportunities for learning. Skill demands in games are varied, and thus, students of all skill levels can participate. The games are inclusive and are designed to minimize domination by individual students. Teachers do this by introducing sport-specific rules, such as a "no contact" rule in netball and "three step dribbling" in basketball. The games are sequenced from simple to complex, and teachers build on previous games and understandings. Teachers explain the aim of the game and the rules and limitations of the game. Students are then allowed to play the game, and the teacher encour-

ages learning through asking questions to individuals and groups; for example, the teacher may ask, "Why did you move to the left of the field? What led you to pass to that player?" By reflecting on tactics and game strategies through such questions, students are developing a deep understanding of game play. As games become more complex, teachers encourage team discussions. Skill should only be focused on within game situations. That is, skills are not abandoned but developed in the context of the game.

Game Sense Assessment

In Game Sense, the aim of assessment is to evaluate the overall game performance, whereas in the traditional skill-led practices for games and sports, the assessment is focused on executing skills. Because Game Sense learning is focused on learning to play and understanding the game as a whole and not on discrete parts of the game such as technique, testing skills out of context of a game is not an AA approach. A skills test outside of a game context is not an adequate measurement or assessment of learning objectives, and it is not used to assess performance in the game. AA is used to assess performance, knowing how to do a skill such as defend a pass, rather than knowing about a skill. Traditional assessment approaches in PE are often product oriented with a focus on components of fitness or decontextualized as in the case of assessment of isolated skills (Penney, Gillespie, Jones, Newhouse, & Campbell, 2011).

Assessment in physical education is complex because much of what students learn is through the physical. Assessing students' skill improvement, attitude toward physical activity and teamwork, and thinking skills in games may be problematic, as students are moving. The assessment of written work is not central to PE learning. Van der Mars and Harvey (2010) noted that historically students were assessed on uniform and effort in class. Assessment of physical skills is a requirement of physical education, but what about the cognitive and affective outcomes such as sportsmanship, teamwork, and understanding strategy? In the direct skill approach, skills are assessed through testing, but what is assessed in Game Sense?

Several Game Sense textbooks have been published in the last decade, but the authors give minimal treatment to assessment. For example, Breed and Spittle (2011) devoted three pages (pp. 78–80), or less than 1%, to assessment. This was also neglected at the ACHPER International Conference held in Adelaide in 2011; only one paper was devoted to assessment (Penney et al., 2011). Nevertheless, at a more academic level, two assessment models for Game

Sense have been developed; these are outlined next. The questions are whether and how these models are implemented in Australian schools and how consistent these models are with the characteristics outlined in theories relating to AA.

Assessment Instruments: GPAI and TSAP

The Game Performance Assessment Instrument (GPAI) and the Team Sport Assessment Procedure (TSAP) are game performance and understanding assessment instruments. Griffin, Mitchell, and Oslin (1997) created the GPAI, intending to "provide teachers and researchers with a means of observing and coding performance behaviours that demonstrate the ability to solve tactical problems in games by making decisions, moving appropriately, and executing skills" (p. 4).

Gréhaigne, Godbout, and Bouthier (1997) concurrently developed a similar instrument: the TSAP. Their primary objective in developing this instrument was to provide teachers with information on student performance in invasion and net games. The TSAP is used to evaluate performance in games that quantifies players' overall offensive performance in selected invasion and net team sports. The teacher observes play within the game and codes game play on an observational grid. The teacher calculates performance indexes and a score. Gréhaigne et al. originally designed the assessment procedure as a form of peer assessment in which students worked in pairs during small-sided games with one playing and the other coding. TSAP is focused mainly on how students receive the ball and how students dispose of the ball, and although these data are quantitative, they have much qualitative meaning about how students played the game. The TSAP is an assessment tool used to evaluate performance, teamwork, and skill development (Gréhaigne, Wallian, & Godbout, 2005). Using the tool, students assess their partner according to how the player gains possession of the ball and offloads the ball. However, to date, no researchers have explored the AA credentials of TSAP or GPAI.

Teachers' Perspectives of Game Sense Assessment

To explore teachers' perspectives, we interviewed 17 PE teachers from 17 New South Wales government schools, as part of a larger study of the structure and effectiveness of PE in government high schools. Teachers who fit the criteria of having completed an undergraduate PE degree and currently teaching PE full time in government schools were invited to participate in the study.

University ethics policies were adopted and one interview was conducted. The semistructured face-to-face interview included several themes, one of which was assessment. The second author conducted the interviews outside of school time and the school settlement. Teachers were asked, "Tell me about physical education and Game Sense assessment at your school." Through this open-ended question, participants were able to describe and interpret issues from their own perspective with a greater depth of response than through closed-ended questions (Babbie, 2005). Probes were used where necessary to evoke responses that related to teachers' general views of assessment issues and teachers' individual current practice. Probes were focused on issues surrounding the use of Game Sense in their particular school and general methods of assessing Game Sense and other physical activities. Interviews were taped and transcribed verbatim. The data from the interviews were analyzed using an inductive approach (Thomas, 2006). Thematic analysis was then undertaken to investigate emerging ideas and identify themes.

For this analysis, we extracted references to assessment related to Game Sense and variant pedagogies. These are presented next in a critical discussion of the five criteria presented by Gulikers et al. (2004).

Setting Authentic Criteria

All teachers commented on criteria with regard to assessment. However, in the majority of cases, the relevance of the criteria to curriculum and to the world outside of school was unclear. Some respondents downplayed the formal aspects of assessment, including the setting of criteria. James, who had been teaching for 3 years, believed that criteria should not be a part of devising a task:

> In our school we have a large Asian population and they are not keen on anything physical. Assessment is not something we spend a lot of time on. Getting them having fun and participating in the activities is our main goal. For me this is the only important criterion.

Some responsdents mentioned criteria with little relation to Game Sense approaches, that is, their established models of assessment. Tim commented,

> We use Game Sense in classes, but the assessment is generally based on attendance, effort in class, you know... the usual. I always try to reward the students [who] make an effort.

Five teachers reported on assessment more closely aligned to the Game Sense curriculum; however, none of them commented on authenticity, that is, how assessment is related to life and life skills beyond school. Also notably lacking was mention of whether the criteria were clearly defined and communicated to students; although in the case of the eight teachers employing GPAI and TSAP, the use of peer assessment presumes that students are aware of criteria. For example, Brenda commented,

> We assess on several criteria related to the Game Sense philosophy: team play, level of involvement, general tactical ability. We rate students on these; we do a few of students each week. That way we cover the class.

Teachers need to develop awareness of authentic criteria by reflecting on the aims and objectives of their teaching and what they mean in terms of skills and knowledge that students may use beyond school. Teachers reported a problem among learning objectives, teaching/curriculum, and assessment:

> We had a system in place before I got here, where the students did Game Sense for most of their classes and then were assessed on skill level. It seemed quite stupid.... The problem was that initially no valid criteria set and then no link to them. (Vanessa)

Authentic Assessment Tasks

Although level of implementation of Game Sense pedagogy in Australian schools has not been addressed in any study, 15 of the 17 participants in this study have used Game Sense in their teaching. Almost all of the teachers used Game Sense pedagogy, but only eight used Game Sense assessment tools based on TSAP or GPAI. From their responses, it was clear that these assessment tools worked well. John noted the effectiveness of TSAP and was taken aback by one students' response to it:

> One of the Year 10 boys told me that they were not the fastest person in the class and so always did badly in sprint tests.

> Their ability to read the game enhanced his results as he was able to successfully conquer the ball and pass it effectively on several times. From then on I used it [TSAP] for all my games classes. (John)

Teachers reported major benefits of TSAP and GPAI: learning through peer assessment and flexibility in application to many sports. They regarded these positively, but also highlighted assessment challenges. Heather and James were introduced to TSAP during pre-service training and used the assessment tool in their first appointments. Heather claimed the students reflected on the nature of the game when she used teacher assessment and peer assessment:

> On most occasions the students who assessed first scored higher than their partners who played first. This is because they thought about what constitutes good team play and what you needed to do to get high marks.

James noted:

> The older kids are pretty kind on each other. The first time I attempted peer assessment all the students had very high scores. Peer assessment needs students to be mature, and unfortunately, many of them want to help each other. My other option was to video tape the students and then individually go through the tapes. This would take hours upon hours. Everything else is subjective.

Teachers spoke enthusiastically about peer assessment, but they also noted the challenges for the reliability of this assessment and the need to weigh this disadvantage against the potential learning benefits. The teachers made positive comments about peer assessment, affirming the *assessment for learning* credentials of these approaches; however, they did not confirm these assessments are truly authentic.

Second, teachers commented how they can readily apply the approaches to invasion games such as netball, football, and touch football, but how they are less effective when applied to other team sports in the striking and target game categories:

> We are big on softball and cricket in physical education because two of the teachers are keen on these sports. TSAP would be useless for softball and cricket, not to mention any

other target sports or for that matter tennis or badminton, which we do not cover anyway. (Nicholas)

Several teachers also critiqued the TSAP and GPAI assessment methods:

> While TSAP is not perfect, it is quite clear, to me anyway, that the scores reflect more on the students' participation, understanding of the sports and general involvement in class. Simply assessing a skill like kicking or throwing is OK, but it needs to be done at the very least in conjunction with decision making team play and other concepts. (Richard)

However, despite some critique, it was clear that, among this group, the alternative assessments such as The Beep Test or Fundamental Movement Skills inventory test were viewed as less superior. Of the nine teachers not using TSAP or GPAI, the majority reported assessing participation/effort and testing summative skills using inventories. Teachers using TSAP or GPAI commented positively on various aspects, particularly in relation to learning, but did not refer to their approaches as AA. No teachers commented on the desire for authentic criteria or tasks. We can only infer that students developed transferable skills from the process of peer assessment. Certainly, none of the teachers explicitly referenced how the assessments relates to knowledge or skills relevant beyond the school context. More particularly, teachers did not comment on the existing knowledge or attitudes of students and how they may integrate these concepts into AA, as presented by Gulikers et al. Essentially, assessment was presented in a vacuum where prior learning and social contexts, commented on elsewhere in the interviews, were not mentioned in relation to how the assessments were developed or implemented.

Physical or Virtual Context

AA needs to be conducted in contexts that directly relate to contexts where students may use the learning in the future. In Gulikers et al.'s (2004) model, it is an important feature because some professional learning assessment is conducted using simulations, real and virtual. In PE, the assessment contexts are generally fixed and stable: assessment of baseball skills, for example, is usually conducted during a baseball game. If the skills are not assessed in a game (e.g., fundament movement skills), the assessment is not authentic. In

Game Sense, the teacher may assess baseball using a game that is modified socially and physically; however, the modification tends to be a "scaling down" of the key characteristics, and thus the characteristics of the full game are preserved.

The teachers interviewed did not comment explicitly on the context or setting of the assessments; however, it was apparent that most assessment was conducted during class-time activities that directly relate to physical activity, games, and sports students may play beyond school. However, six teachers reported assessment using fundamental movement skill inventories, and these do not meet this criterion for authenticity. When skills are assessed in isolation, the assessment cannot be authentic, because in real life, skills are not used in isolation.

Social Context

Authentic social, as well as physical, contexts are important in AA. Teachers commented on the social dynamics of their classrooms, but these comments were not related to assessment practices, except when the eight teachers using TSAP and GPAI discussed the dynamics of peer assessment processes. Heather commented,

> Look, the students are involved in the grading and that makes them more engaged socially. They are watching each other. They also know they need teamwork to achieve individually. Compare that to the beep test where most students get eliminated or eliminate themselves in the first two stages and then watch some gifted athletes getting to stage sixteen thirty minutes later.

Almost all of the 15 teachers who used Game Sense commented on social interaction and teamwork. They said,

> I use Game Sense because I feel it engages my students more and classes flow easily and quickly because they are having fun. (Brenda)

> Really.... anything else doesn't get them all involved and you spend most of your time shouting and ordering students to do things. I am at a stage now where I turn up to class, set the games up and facilitate learning. (James)

> In a 4-versus-4 cross game, I stood back and watched as two kids who would never have spoken on the playground had to work together and actually started chatting about other things as they were running around. (Heather)

However, few analytic comments were made that related the social aspects of Game Sense, such as teamwork, communication, or cooperation, to assessment using TSAP, GPAI, or other approaches. Only one teacher commented that the students were learning transferable social skills through Game Sense, and presumably its assessment:

> I love Game Sense because my students enjoy it and I know they are developing team skills that they can use elsewhere. If I do basic skills with them, many don't enjoy it and there's often no teamwork. (Brenda)

AA needs to be completed in an authentic social setting that directly reflects a social setting that students will encounter elsewhere in life. Performance must also be recognized and evaluated within that social setting. Game Sense is a platform for this, and to be assessed for tactical understanding, students need to understand teamwork. This element could be developed more in Game Sense, as in the authentic social setting of Game Sense activities, students develop several transferrable social skills. One teacher commented,

> The less evasive nature of Game Sense was quite clear. The fear factor was not as great. One of the strengths of the assessment is that students are having fun enjoying the game, and teachers need to incorporate fun ways of assessment in order to encourage maximum participation without the students getting to nervous by the word "assessment." (Richard)

Authentic Assessment Results

In AA, the teacher needs to demonstrate the skills or competencies. In PE, this is a performance assessment. The teachers reported several assessment results: attendance marks, effort grades, and indicators such as Volume of Play, Efficiency Index, and Performance Scores on which students are assessed by peers in TSAP and GPAI.

Teachers reported using the peer assessment grids for TSAP and GPAI, which include multiple indicators of performance. Brenda noted,

> Students know the whole thing, the grid and how to score it. There are several things they need to think about, ways they can get points.

This shows that the Game Sense assessment results are authentic because the assessment requirements are clear and and the assessment includes multiple indicators, and the students have to understand those indicators because they are doing peer assessment. It was not clear from interviews whether teachers used demonstrations and exemplars to reinforce students' understanding of the assessment results. These may also be used to build authenticity in assessment results.

In particular, through peer assessment, as reported by eight teachers using TSAP and GPAI, students understood the meaning of assessment. These teachers' use of peer assessment is supported by Gréhaigne, Godbout, and Bouthier (2001), who noted that students are provided with more opportunities to learn and develop a greater understanding of the concepts and tactics associated with each game not only due to their active involvement in these games, but also through the peer assessment that occurs during the TSAP process. Two teachers reported that students who were assessing could be observed encouraging their partner to perform and coaching them from the sidelines, providing feedback to improve their player's performance.

Conclusions

AA is dominant in the current rhetoric of best practice in PE. However, we have ventured to show that further attention is needed if the potential benefits of AA and assessment for learning are to be reaped. We have used Gulikers et al.'s (2004) model of AA practices to analyze current literature and practice, as reported by 17 teachers.

Game Sense pedagogy influence was widespread for the teachers in this study; however, not all teachers used game performance and understanding assessment tools such as GPAI and TSAP. Some teachers used assessment, which was incongruent with Game Sense learning objectives, which was not authentic in nature and unlikely to promote learning. Eight of the teachers, however, used GPAI or TSAP. These assessment tools meet some of the criteria for AA set

out by Gulikers et al. (2004). In particular, they involve authentic physical and social contexts with strong multiple indicator assessment results. However, there is room to develop AA through more authentic learning objectives; in other words, objectives more closely related to performance in physical and social activities outside of school. Assessment could also be more authentic through the tasks used. For example, peer assessment of tallies in volume of play could be complemented by other approaches including qualitative grading of teamwork. Teachers highlighted the strengths of peer assessment; however, the difficulties in developing and maintaining reliability in peer assessment cannot be ignored. Thus, teachers should use more diverse approaches.

The report of teachers not using systems such as TSAP and GPAI is concerning, as questions may be raised about the validity, success, and authenticity of their assessment procedures. How can a student be accurately assessed on syllabus outcomes if the teacher only marks an assessment based on their skill acquisition and proficiency? Tactics and team play need to be covered in assessment. When teachers accept a games-centered approach to teaching games, it should be assumed that the playing of games provides an authentic scenario for assessment. Thus, if teachers choose to use games-centered approaches to PE, they must also assess students in the context of a game.

As a final point, in general, deeper reflection on the aims and possibilities for assessment in PE is needed. The literature in this field and the teacher interviews show that researchers need to understand the position of PE within the broader school context and contexts beyond the school. This examination of AA indicates the relationship between PE classes and activities beyond school is an area of weakness. For example, are PE educators considering ways in which they may use Game Sense learning to develop transferrable social and teamwork skills in students? By clarifying the role of PE in more generic and transferrable skills, they have the potential to develop the esteem of PE as a curriculum area. By focusing on assessment, AA, and other approaches, PE educators may become more analytical about the teaching and learning in which they are engaged—its objectives, processes, and outcomes.

This paper has been published at a time when PE in Australia is under threat due primarily to the formation of the Australian National Curriculum. Professionals in key learning areas are scrambling to justify the significance of their topic, and naturally assessment is a

key tool. As van der Mars and Harvey (2010) signaled, only with "correct application and alignment of assessment and evaluation for learning will result in; certification, teacher accountability, progression, motivation, diagnosis and curriculum reform" (p. 36). AA has been promoted as best practice in contemporary assessment in the field of PE. However, the comments of teachers interviewed for this study draw into question the effectiveness of the PE literature in informing effective AA. Practice, even in an innovative field such as Game Sense, does not meet some of the criteria for AA outlined by Gulikers et al. (2004). Researchers need to further scrutinize assessment in PE and introduce reforming evidence-based practice so the value of PE may be better understood by, accessed by, and communicated to the wider community.

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PEDAGOGY

Inclusion in Extracurricular Sport: A How-To Guide for Implementation Strategies

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Abstract

Physical activity and extracurricular activity has become a topic of importance in the United States. The nation's government officials have brought to light the need for increased awareness, advocacy, and support of the participation of youth with disabilities in recreation and leisure activities (e.g., extracurricular and school-sanctioned sport). The Government Office of Accountability recently released a "Dear Colleague Letter" bringing awareness to the need to improve acceptance and accountability in including students with disabilities in extracurricular physical activities. The purpose of this article was to provide implementation strategies for inclusion of students with disabilities into physical education opportunities and extracurricular athletics.

Recreation and leisure activities are necessary for high quality of life for all people, including those with disabilities. Developing an appreciation of and participating in these activities begins during school-aged years. It is imperative that physical education teachers acknowledge, understand, and implement program modifications

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that will facilitate full participation of students with disabilities. The patterns of inactivity in childhood and adolescence correlate to higher rates of inactivity, obesity, and other health problems in adulthood (Biro & Wien, 2010; Caspersen, Pereira, & Curran, 2000; Gordon-Larsen, Adair, & Suchindran, 2007; Whitaker, Wright, Pepe, Seidel, & Dietz, 1997). Despite the public's awareness of the risks related to inactivity and obesity, limited research has been conducted that provides evidence of effective practices and approaches to increase physical activity, reduce obesity, and maintain health among students with disabilities (Durstine, 2000; Kissow & Singhammer, 2012; Li & Chen, 2012; Rimmer, Chen, McCubbin, Drum, & Peterson, 2010). Furthermore, there is limited understanding of how research on children without disabilities can be translated into guidance for physical activity programs for children with disabilities (Rimmer & Rowland, 2008). Among students with disabilities, the lower rates of physical activity may be related to the lack of appropriate opportunities for physical activity, recreation, and athletics. Rimmer and Rowland (2008) reported that physical activity is 4.5 times lower for students with disabilities than their peers without disabilities.

The Obama Administration via the Acting Assistant Secretary of Civil Rights of the Office of Civil Rights (OCR) released a "Dear Colleague Letter" on January 15, 2013, lending support to ensure the inclusion and equal rights of school-aged students with disabilities in extracurricular athletic opportunities. This letter was addressed with urgency and was focused on the need to provide equal rights for students with disabilities within the context of public school extracurricular sport (K–12 and postsecondary education). Access to participation in extracurricular activities is required, per federal regulation, for students with special needs. The Individuals With Disabilities Education Improvement Act (IDEIA) of 2004 requires each state to ensure that public agencies provide extracurricular services and activities to afford children with disabilities an equal opportunity for participation. Section 300.107 of IDEIA goes on to say that those services and activities include athletics and transportation. One example of a state following through with implementing this requirement is Indiana's Special Education Rules Title 511 Article 7. For example, 511-ICA 7-42-10(b)(2) states that public school agencies must provide students with the services required to "ensure that students with disabilities participate with nondisabled students in the extracurricular services and activities to the maximum extent

appropriate...” The same section of Article 7 defines extracurricular activities to include athletics. Additionally, 511-IAC 7-43-1(u)(A) requires public school agencies to include transportation “for participation in nonacademic and extracurricular activities if transportation is provided to nondisabled students.” Although including students with disabilities in extracurricular and physical activities is not a new concept, many public schools in the United States have overlooked it for many years. The purpose of this article was to provide implementation strategies for inclusion of students with disabilities into physical education opportunities and extracurricular athletics. An overview of the problem is discussed and suggestions are given to increase opportunities for students with disabilities to access physical activities including physical education and extracurricular athletics.

History of Sport and Youth With Disabilities

To fully understand the message delivered by the OCR in its “Dear Colleague Letter,” it is important to understand the laws that preceded the letter. Currently, over 95% of children with disabilities are mainstreamed in regular public school programs (IDEIA, 2004). IDEIA (2004) requires public school programming and supports to be provided in education systems for students with disabilities within a least restrictive environment. This means that students with disabilities must be permitted to participate with their typical peers in the general education setting as much as possible. Although physical activity professionals (e.g., coaches and trainers) and physical education teachers would agree that schools have made significant progress regarding implementation related to academics, it appears they have made little progress regarding implementation related to school-sanctioned athletics.

To more fully appreciate inclusion related to school-sanctioned athletics, the history of youth sports in general needs to be considered. During the second half of the 19th century, highly organized youth sport programs were implemented in the United States (Wiggins, 2013). Initially, these programs were available mainly to White males. African American males were prohibited from competing alongside their White peers, and girls of all races struggled to break the barriers prohibiting their participation based upon notions that girls possessed limited and fragile physical and emotional capabilities (Wiggins, 2013). These significant barriers of race and gender began to crumble during the Civil Rights Movement. Near the end of the Civil Rights Movement and with the passing of public law PL

93-112, the Rehabilitation Act of 1973, African American boys were permitted to compete with and against their White peers. Girls, however, had to continue pursuing the right to be included, which led to a civil rights investigation in 1973 that ultimately led to a 1974 decision from Congress that permitted girls to participate in the National Little League baseball program.

Although legislation and laws that governed youth sports changed as a result of the Civil Rights Movement, implementation at the local level was not immediate. There is a similar pattern today with the efforts for full inclusion of students with disabilities into school-sanctioned athletics. The Rehabilitation Act of 1973 protects the civil and constitutional rights of people with disabilities from discrimination. Section 504 of that law provides protection for public school students with disabilities from discrimination. Section 504 of the Rehabilitation Act of 1973 states that

> no otherwise qualified individual with a disability in the United States... shall, solely by reason of his or her disability, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.

The law goes on to require public schools to provide a free and appropriate public education (FAPE) through ensuring that students with disabilities have equal access and opportunity to participate in all activities, including athletics. Around the same time, Public Law 94-142, the Education for Handicapped Children Act of 1975, was passed to ensure equal opportunities for students with disabilities in public education. As during the Rehabilitation Act of 1973, there was not a sense of urgency to implement changes toward accommodating and providing equal opportunities for students with disabilities.

Fast-forward 17 years to the Americans With Disabilities Act (ADA) of 1990, which is described as "the most sweeping civil rights legislation in a quarter century,… seeks to eliminate the bias by private and public enterprises…" (Dempsey, 1991, p. 310). Section 504 of the Rehabilitation Act of 1973 applies to those who receive federal funds, whereas the ADA applies to every entity except churches and private clubs (Smith, 2001). The ADA contains a section that outlines the guidelines that are specific to the participation of students with disabilities in sports. For inclusion to be ensured to the student with a disability in sport, the student must be otherwise

qualified to participate and the accommodations for success need to be reasonable. The guidelines in the ADA may be interpreted in many ways and may be the reason why some organizations find ways around this law ("Special Education and Sports," 2013). Also in 1990, Public Law 101-476, the Individuals With Disabilities Education Act of 1990, mandated that financial support be given from the federal government to meet the proposed changes: due process rights, Individualized Education Plans, the Child Find Mandate, personnel training and development, and a least restrictive environment. Since then, several new laws and amendments have been passed to ensure the full inclusion of students with disabilities in the public education setting. Currently, Public Law 108-446, IDEIA (2004), is in effect and ensures that students with disabilities are included, to the maximum extent appropriate, in the general education setting.

Although several significant pieces of legislation prevent discrimination of students with disabilities (Rehabilitation Act of 1973, Education for All Handicapped Children Act of 1975, Americans With Disabilities Act of 1990, Individuals With Disabilities Education Act of 1990, and Individuals With Disabilities Education Improvement Act of 2004), implementation at the local level has been delayed in a similar manner as the implementation for African American boys and girls following the Civil Rights Movement. Perhaps the recent release of the "Dear Colleague Letter" will be the catalyst needed for meaningful discussion regarding the establishment of clear guidelines, which will lead to full implementation and equal access for students with disabilities through participation in school-sanctioned athletics, which will lead to increased physical activity.

Typically, students with disabilities engage in very little school-based physical activity, less healthy after-school activity, and more sedentary amusements (Rimmer & Rowland, 2008). The U.S. Government Accountability Office (GAO, 2010) revealed that despite legislation obligating states and schools to provide equal access, opportunities for physical activity are limited for students with disabilities. As such, the GAO reported in 2010 that 440,000 students with disabilities received services under Section 504 of the Rehabilitation Act of 1973 rather than IDEIA (2004). Like IDEIA, Section 504 ensures that equal rights and opportunities are extended to children with disabilities in education (including physical education and extracurricular sport) and other settings. Unlike IDEIA, Section 504

is not government funded. This makes it unlikely that students with disabilities under a 504 plan are receiving equal sports and physical activity opportunities as their peers without disabilities.

However, there is a dearth of scholarly information about the effective inclusion practices for students with disabilities. Even with the limited research on effective practices, there is growing evidence in the research literature regarding common obstacles and barriers to physical activity for students with disabilities (Rimmer, et al., 2010).

Potential Barriers to Implementation

Common barriers are inaccessible facilities and equipment (Auxter, Pyfer, Zittel, & Roth, 2010; Block, 2007; Rimmer, 2005; Rimmer & Rowland, 2008; Simeonsson, Carlson, Huntington, McMillen, & Brent, 2001; Stanish, 2010); personnel without sufficient training (Auxter et al., 2010; Block, 2007; Rimmer & Rowland, 2008; Stanish, 2010); and inadequate, noncompliant, or otherwise inaccessible programs and syllabi (Auxter et al., 2010; Block, 2007; Rimmer, 2005; Rimmer & Rowland, 2008; Simeonsson et al., 2001).

Educators agree that all children should have equal access to participate in competitive athletics. Students with disabilities are intelligent, productive, capable, and uniquely strong individuals. They deserve equal respect, consideration, and access. However, school officials may encounter significant barriers. Perhaps the most significant barrier is access to sufficient resources needed to implement the modifications/accommodations needed for students with disabilities to participate fully in school-sanctioned athletics. Specifically, a lack of dollars and personnel are common barriers in schools.

In recent years, federal and state allocations to public schools have been significantly reduced. Public schools are operated on federal, state, and local dollars. Unlike other businesses, public schools have limited opportunities to increase their revenue. Unless a community votes to voluntarily increase property taxes, a public school cannot increase revenue on which to operate. Additionally, school officials are not permitted to reference a lack of funding when discussing the needs of students with disabilities. Yet, public school officials are often asked to do more with less and are then charged with the vital role of educating all students to be independent young adults who are prepared to transition successfully into the workforce. To address the need for financial support, stakeholders may

use several resources. Financial support may be obtained through grants, scholarships, foundations, and discussing and advocating for funding through the school district.

Additionally, each student with a disability has an Individualized Education Plan (IEP). Federal law (IDEIA) and Indiana special education law (Title 511, Indiana State Board of Education, Article 7) require a student's IEP to include all special education supports, including physical education (as a direct service) and other necessary related services (e.g., physical therapy, occupational therapy) to demonstrate adequate school progress. For example, a student who is deaf may need an educational interpreter (EI) during the school day. This support is required for the student to demonstrate academic progress. If that same student plays tennis, an EI must be provided for that student during tennis season. The EI goes to practice, travels on the bus, and is with the student during meets. Another example is a student manager for the basketball team who has cerebral palsy, is nonambulatory, and uses a wheelchair. This student has the right to be fully included with equal access. However, the same supports for athletics must be provided that are written into his IEP for education. This student's IEP likely includes special transportation as a related service. This means transportation must be provided for this student to and from basketball games via the use of a lift bus. Since a lift bus is not large enough to transport the entire team, two buses will need to be driven to the game or another accommodation for transportation will need to be provided. Providing qualified personnel needed for service delivery during evening and weekend hours is a barrier for the school. Employing qualified personnel to provide support for students with disabilities to participate in extracurricular sports may best be accomplished through partnerships with key stakeholders. By advocating for the cause (e.g., need for extracurricular PA opportunities for youth with disabilities), school officials can find knowledgeable personnel. Parents, community leaders, local recreation centers, and/or local Special Olympic organizations are excellent resources to use as coaches and/or supports when trying to include students with disabilities into mainstream sports.

To overcome these barriers, stakeholders will need to collaborate. Often all it takes is someone who will advocate for the student with the disability. This can be a teacher, coach, parent, friend, sibling, or the student. Educators, parents, student-athletes, business owners, and community members must engage in meaningful discussions regarding solutions to barriers. Without these discussions,

change is unlikely to occur. The first step to improving inclusion in extracurricular sports is to advocate and provide a voice for students with disabilities who want to participate. In cases where students with disabilities are not involved in extracurricular sports or activities, stakeholders need to provide information to students with disabilities on how to become more involved and ensure them that they will be provided the appropriate accommodations. With this encouragement, students with disabilities may be more inclined to participate in competitive extracurricular sports teams. For students who are physically or cognitively unable to benefit from participation through typical competitive teams, school officials may wish to consider other options through collaboration with key stakeholders. For example, alternative opportunities to participate on competitive teams (e.g., wheelchair basketball) could be implemented, and partnerships with local chapters of Special Olympics may also benefit students with disabilities.

Current Participation in Extracurricular Sports

Sports participation among individuals with disabilities has been shown to promote healthier lifestyles (Machek, Stopka, Tillman, Sneed, & Naugle, 2008), increase self-esteem (Castagno, 2001), enhance peer acceptance (Gibbons & Bushakra, 1989), and boost perceived competence (Gibbons & Bushakra, 1989). Generally speaking, students with disabilities participate in extracurricular sports at a lower rate than their same-aged peer without disabilities (GAO, 2010). Although extracurricular sports programming has been developed in some public schools for youth with disabilities, officials at many schools reported a lack of funding and informational support in creating more athletic opportunities for their youth with disabilities (GAO, 2010).

Although support has been given to ensure the inclusion of students with disabilities in sports (e.g., OCR, 2013), at first glance, it seems daunting to include students with disabilities in organized and extracurricular sports. However, by participating in training and instruction, educators and coaches can easily include all students as accommodations and modifications come in all shapes and sizes. There is a need to advocate for equal opportunities for students with disabilities in extracurricular athletics that are appropriate and mindful of their ability levels. How-to tips are offered in this paper to ensure that physical education teachers, coaches, general education teachers, parents of children with disabilities, and/or athletes

(or potential athletes) with disabilities are advocating for and implementing opportunities to participate in K–12 and postsecondary extracurricular athletics. These include organized competitive sport, club, and intramural athletics (OCR, 2013).

Advocating for Students and Athletes With Disabilities

Students with disabilities are much like their peers without disabilities. One similarity is that they need the support of mentors (e.g., teachers, coaches, parents, and friends) to reach their potential. Unfortunately, based on the data reported by the GAO (2010), students with disabilities are not likely to be engaged in extracurricular sports or activities. Therefore, educators and coaches must look for potential athletes (with disabilities) and encourage them to participate.

What can you do?

1. Get to know the students with disabilities in your school and community. What are their interests? What do they do in their free time? What would they like to do?
2. Educate yourself on the disabilities the students in your school and/or community have to best meet their needs and encourage them to participate in extracurricular sports. A helpful tool available online is http://nichcy.org/disability/categories, with a list of each disability category identified under IDEIA and a brief description of each.
3. Interact with students with disabilities and encourage interaction among peers to support positive social interaction and support. This may be done in several ways (e.g., peer tutoring programs, open recreation nights, disability awareness programs), which will be discussed later.
4. Get to know a special education teacher in your building. Ask him or her for ideas regarding how to include students with disabilities in a meaningful way. Additionally, several organizations provide informational training for potential coaches (e.g., BlazeSports and Special Olympics).

Breaking Through the Stereotypes

At first glance, it is easy to assume individuals with disabilities cannot do a particular task; however, this may not be the case. Students with disabilities are capable of many tasks and have individual strengths and weaknesses like their peers without disabilities. Working with students with disabilities may help teachers develop

greater empathy and better understand their needs. By becoming advocates and using appropriate and nondiscriminating language (e.g., person-first, disability-second language), teachers model acceptable behaviors for others in the school, in the community, or on the team.

What can you do?

1. Encourage disability awareness activities that promote an understanding and exposure to, experience with, and ownership of what it means to have a disability. Lieberman and Houston-Wilson (2009) suggested that through a positive disability awareness program, educators and coaches can easily facilitate the inclusion of students with disabilities.
2. Encourage open and positive communication between students with and without disabilities. This can be done during the school day or outside of school (before or after school) such as pickup games, field trips, and movie screenings. These activities will be fun for everyone, and students will feel encouraged to communicate openly and develop friendships. Without open communication, students with and without disabilities may feel excluded from a particular activity.
3. Use person-first language. When talking to or about an individual with a disability do not identify them by their disability first. By using person-first language, you are demonstrating that you are aware that a person is not defined by his or her disability.
4. When negative communication is occurring (e.g., "that kid is retarded"), address it immediately and educate all parties involved on what it means to use derogatory language.

Adapting for the Athlete

One common misconception is that individuals with disabilities are unable to participate in "regular" sports. This is often not the case, particularly in regard to youth with physical disabilities. Individuals who are deaf may need additional visual cues to understand what they need to do. Students who use a prosthetic or have an amputation may need instructions on using equipment through modifications or competing in an activity. As long as the adaptation does not "change" the game/activity, it is appropriate, and individuals with disabilities can and should be included.

What can you do?

1. Be creative, and get to know students with disabilities who are interested in getting involved in extracurricular sport ac-

tivities. Adaptations can be made regardless of the sport and athletes with disabilities should be encouraged to participate in inclusive school sports. It is important to include students with disabilities in the process of identifying which accommodations/modifications may work best for them. Ask your students what works best and try it out.

2. Be flexible and use your resources. There are plenty of online resources that you may use to educate yourself and your athletes. PE Central has an adapted physical education link (http://www.pecentral.org/adapted/adaptedmenu.html) with lesson ideas and links to topics such as assessment, IEP development, and working with parents and paraeducators. The USA Deaf Sports Federation (http://www.usdeafsports.org), United States Association for Blind Athletes (http://www.usaba.org), and Disabled Sports USA (http://www.disabledsportsusa.org) are a few official organizations that offer information that may aid in educating people on how to include individuals with disabilities into extracurricular sports.
3. Encourage your students with disabilities to try new activities. Much like students without disabilities, they sometimes do not know that they are good at an activity without first trying it. By creating open gyms and unofficial practices, all students can try the sport without feeling the pressure of being the best.

Different Can Still Be Equal…and Fun

Sometimes the modifications necessary to include students with disabilities change the game/sport too much or create unsafe environments for the athletes. In these cases, disability-oriented sports are available that create fun and competitive physical activity for youth with disabilities. For example, goalball (www.goalball.us) and beep baseball (http://www.nbba.org) teams may be created for youth with and without visual impairments. Additionally, several wheelchair sports have been developed to ensure individuals who use wheelchairs can participate in competitive sport. For example, wheelchair basketball (http://www.nwba.org), tennis (http://www.usta.com/Play-Tennis/Wheelchair-Tennis/Wheelchair/), and rugby (http://www.quadrugby.com) teams have been developed to increase participation for athletes using wheelchairs. Additionally, several sports may be modified for individuals with disabilities (e.g., track

and field, swimming, judo, baseball). Information regarding which sports are available for individuals with disabilities may be found at http://www.specialolympics.org and/or http://www.teamusa.org/US-Paralympics.aspx.

What can you do?

1. Again, use your resources, search the Internet (see links already listed), and reach out to community partners to see what is already available in your community. Professionals at the local YMCA and Special Olympic organizations (http://www.specialolympics.org) are great resources to figure out what is already available in your community. Many times, practitioners at small local organizations work specifically with individuals with disabilities and already have small teams in place. If this is not the case in your area, start your own teams and reach out to officials at local organizations and schools to expand participation.
2. Infuse disability sport units into a physical education curriculum. By participating in disability sports, students learn a great deal and are exposed to what is available while participating in the same amount of physical activity as they would playing a mainstream sport.
3. Create open recreation nights, and invite all students/athletes with and without disabilities to come together and play their sport. With an inclusive environment designed around promoting physical activity for everyone, word will likely get out and teams or events will be created.

Conclusion

States and school district officials can increase opportunities for students with disabilities by reducing or eliminating common barriers to participating in physical activities. Students with and without disabilities may benefit from working together to promote successful participation in inclusive extracurricular sports and activities. Everyone, regardless of ability level, disability, or interest, has the right to be included in organized physical activity. Due to the support of the GAO and the legislation behind the right to equal opportunities (OCR), now is the time to advocate and take a stand on including and creating opportunities for students/athletes with disabilities to participate in extracurricular sports and activities.

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PEDAGOGY

Effects of a Physical Education Supportive Curriculum and Technological Devices on Physical Activity

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Abstract

The purpose of this study was to examine the effects of a physical education supportive curriculum and technological devices, heart rate monitor (HRM) and pedometer (PED), on physical activity. A single-subject ABAB research design was used to examine amount and level of participation in physical activity among 106 suburban fourth and fifth graders during physical education class. A curriculum, which was pedagogically centered on the use of the technological devices, was also developed and studied. Six children from each group and the physical education teacher were interviewed. The results of a one-way ANCOVA indicated group differences between the supportive curriculum and technology for HRMs, PEDs, and increased physical activity.

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Physical education (PE) classes during school and physical activity after school are becoming significantly more important due to the rise in obesity in youth. Increased time in PE reduces the likelihood that young children will become obese (Cawley, Fritzvold, & Meyerhoefer, 2013). Obesity is a serious health concern for children and adolescents today. Recent data indicate that about 17 % (12.5 million) of children and adolescents aged 2 to 19 years are obese in the United States (Centers for Disease Control and Prevention [CDC], 2011). Furthermore, since 1980, the prevalence of obesity among children and adolescents has almost tripled (CDC, 2011).

Since PE is a part of the total education of every child, teachers have a responsibility to children in their level of physical activity and fitness (National Association for Sport and Physical Education, 2013). Schools are a unique environment to influence the area of fitness where teachers can develop health-related activities and assessment programs to promote proper activity and assess the physical well-being of children. PE and health education professionals are trained to teach children how to be physically active and eat properly. Furthermore, partnering with school districts should be a part of a public health approach to improving the health of overweight children (Carrel et al., 2005). Physical educators have the opportunity to influence children and adolescents in their activity patterns through developmentally appropriate instructional programs administered during class (Buck, 2002).

Students frequently use heart rate monitors (HRMs) and pedometers (PEDs) in PE classes (Duncan, Birch, & Woodfield, 2012; Ladda, Keating, Adams, & Toscano, 2004). Through these technologies, students receive augmented feedback and are able to quantify their exercise experience. Both instruments are appropriate to use with children, are self-monitoring tools, and are useful in promoting physical activity (Duncan et al., 2012).

By using HRMs and PEDs features and tools, students gain a new awareness of their physical activity measures and goals. These devices are part of the *new* PE curriculum. Researchers who have used PEDs and HRMs as a part of the new PE have presented many implications for practice in the field of PE. HRMs and PEDs are tools to individualize instruction to meet students' needs because activities are focused on time spent in the target heart rate zone and how many steps they are accumulating during PE class. By using these devices, students may feel motivated to be physically active

and have more self-confidence because they receive instant feedback about their level and amount of physical activity during PE class. Teachers and students are more accountable when using these devices. These devices are an objective means of assessing student performance and effort, and by using these devices, students learn how physical, mental, and emotional challenges affect their heart rate and number of steps (Ignico & Corson, 2006; Strand & Mathesius, 1995; Tipton & Sander, 2004).

A recent examination of the PE pedagogical literature indicated a trend of emerging studies with researchers investigating the use of PEDs and HRMs in PE classes (Le Masurier, 2004; Sequira, Rickenbach, Wietlisbach, Tullen, & Schutz, 1995). Researchers also indicated that using PEDs and HRMs with children in PE classes increased the amount of physical activity (Duncan et al., 2012; Grissom, Ward, Martin, & Leenders, 2005; Schofield, Mummery, & Schofield, 2005). Researchers also used PEDs and HRMs together (Lubans, Morgan, Collins, Boreham, & Callister, 2009).

Researchers also indicated that using integrated curriculum along with the devices may yield significant results (Duncan et al., 2012; Ignico & Corson, 2006; Oliver, Schofield, & McEvoy, 2006). Duncan et al. (2012) implemented a 4-week integrated curriculum with 59 children based on walking from one location to another. Body mass index was determined pre- and postintervention and steps per day were measured with pedometers throughout the research. The results indicated that steps per day were higher during the intervention and postintervention.

Oliver et al. (2006) demonstrated how a supportive curriculum (SC) improved the effectiveness of technology. They used PEDS as a motivational and educational tool for measuring accumulated physical activity. They designed and implemented a 4-week integrated elementary school curriculum unit, based around PED walking and quantified the physical activity levels in children. They found children's physical activity levels increased and the curriculum was an effective motivational tool for children.

Ignico and Corson (2006) demonstrated how teachers can motivate students to be physically active by providing concrete feedback and evidence of success in physical activity with HRMs. Participants were 175 fourth and fifth grade students. The students in the treatment group received instruction at the beginning of the school year about using the HRMs and staying in the target heart rate zone. They also wore HRMs each day during class. The students in the

control group did not use HRMs for PE class. The results indicated that the students in the treatment group performed better on the mile run performance.

Theoretical Framework

Deci and Ryan's (2011) self-determination theory, intrinsic motivation to be physically active, stems from people's "natural or intrinsic tendencies to behave in effective and healthy ways" (para. 1). HRMs and PEDS combined with SC may be used to promote intrinsic motivation by increasing awareness and comprehension of physical activity level and amount (Ignico & Corson, 2006; Strand & Mathesius, 1995; Tipton & Sander, 2004).

The range of research reviewed indicates the use and need for HRMs and PEDs in PE settings. Few researchers to date have monitored students' physical activity and level within a PE setting. Furthermore, few researchers have used SC to accompany the implementation of HRMs and PEDs in PE settings.

Purpose

The purpose of this research project was to fill a gap in the literature by creating SC for HRMs and PEDs for physical educators to use in PE settings. The purpose was also to determine whether using SC for HRMs and PEDs would increase the level and amount of physical activity in fourth and fifth grade students.

Guiding Hypotheses

For this study, the researcher hypothesized that due to the SC designed for HRMs and PEDs, fourth and fifth grade students would feel intrinsically motivated to increase their level and amount of physical activity. Due to the immediate feedback of physical activity from the HRMs and PEDs combined with the SC provided by the PE teacher, the students would feel intrinsically motivated to increase level and amount of physical activity during PE classes.

Method

Participants

The participants for this study were a suburban upper elementary population, aged 9 to 12 (Grades 4 to 5). The participants also participated in PE once a week for 40 min. One hundred five student participated in the research project; 93% of the students and parents involved in the fourth and fifth grade classes agreed to participate in

this project. Forty-seven of the participants were male and 58 were female. Of the participants, 1% were Black, 1% were Hispanic, 97% were White, and 1% were Asian. These participants attended public school in the state of Rhode Island on the east coast of the United States. The researcher followed proper channels with the institutional review board (IRB) to gain approval to conduct research.

There were six participant groups. The PE teacher met with each group once a week. The students in the three fourth grade groups participated in two PED SC groups (PED SC A and PED SC B) and one PED group. There were 14, 17, and 15 participants in each group, respectively. The students in the three fifth grade groups participated in the No HRM group, HRM SC group, and HRM group. There were 18, 21, and 20 participants in each group, respectively.

Materials

The students in the the HRM SC group and the HRM group wore Polar HRMs (E200 nondownloadable and E600 downloadable series). Students in each group wore both models, but the downloadable feature was not used in this study. Students indicated they had not previously worn HRMs during PE class. HRMs have been shown to be as accurate as an electrocardiography (Engstrom, Ottosson, Wohlfart, Grundstrom, & Wisen, 2012). Every student in all groups wore a pedometer. The pedometers used were the Digi-Walker Accusplit Eagle 170 model. This pedometer has been found to be 98% accurate (Accusplit, 2008) and a valid instrument for measuring physical activity (Tudor-Locke, Williams, Reis, & Pluto, 2002).

Procedure

A single-subject research design (ABAB) was used to examine the amount and level of participation in physical activity among 106 suburban fourth and fifth grade students during PE class and whether the use of a technological device and/or teacher instruction contributed to increased participation in physical activity. The amount and level of physical activity is reported in steps per min and beats per minute, respectively. Although the research focus was the amount and level of activity in the gymnasium, the use of the technological devices, a heart rate monitor (HRM) or a pedometer (PED), was studied. An SC with an interdisciplinary skill theme that was centered on the use of the technological devices was written specifically for this study. The SC was different from standard practice as it was focused on the successful implementation of HRMs and PEDs and

implications of level and amount of physical activity on the body in PE classes. Daily vocabulary words, visual aids, detailed instructions, and explanations linking physical activity, health, and technology were used in the curriculum.

The PE curriculum included locomotor activities; space awareness, chasing, dodging, fleeing, and cooperative games; team-building activities; and throwing and catching using equipment such as balls, hoops, and beanbags. This curriculum included the diverse activities fourth and fifth graders normally participate in during PE. The same curriculum was used for HRM and PED groups. Since an ABAB design was employed, the researcher alternated between locomotor and manipulative activities. This design ensured that the students received 1 day of locomotor activities and 1 day of manipulative activities throughout the study.

A pilot study was conducted a semester prior to implementation. Fourth and fifth grade subjects from an urban school were asked to participate in the research project. Six pre-service PE teachers were asked to teach in the study. The researcher held 8 hr of teacher training for the pre-service teachers. The teacher training was split into two 4-hr sessions. The sessions included an overview of the research project, a review of how to use HRMs and PEDs, a review of how to use a microphone and recorder, a review of all eight lessons, a review of all teacher scripts, and a review of data collection procedures. In addition, the researcher addressed teachers' questions, and the teachers practiced using the scripts. The participant groups were Group 1: HRM-instruction (HRM-I); Group 2: HRM (HRM); Group 3: HRM-control (HRM-C); Group 4: PED-instruction (PED-I); Group 5: PED (PED); and Group 6: PED-control (PED-C). Major revisions were made to the design of the research project upon the completion of this pilot study, including finding one PE teacher to teach all of the groups.

The participant groups employed for this research were three fourth grade PED groups and three fifth grade HRM groups. Cluster sampling was used to determine the participant groups. The students in the HRM and PED groups wore HRMs and PEDs, respectively, while participating in typical—traditional—PE class. The activities alternated between locomotor activities such as tag games and manipulative activities such as striking, kicking, and dribbling. Students in the HRM and PED SC groups wore the devices and received SC/instruction. These groups represented the New PE. Three fifth grade classes were available for the study at the elementary

school. The researcher named the classes (groups) HRM, HRM SC, and No HRM SC. Since three fourth grade classes were also available for the study, the researcher chose to use one class for the PED group (traditional PE) and the other two classes for the PED SC groups (new PE). These SC groups were named PED SC A and PED SC B. Since the HRMs were more difficult to use than the PEDS, the researcher chose to designate the fifth grade classes for the HRM groups and the fourth grade classes for the PED groups.

The SC lessons included the same activities as the traditional PE classes; however, rationale and background information on using the HRMs and PEDs were offered in these lessons. The students were taught how to read and interpret their step count and heart rate information from the devices and to set personal goals using the devices. The students were asked to look at their step counts and heart rate information periodically throughout the lessons. The students in the HRM SC and PED SC groups also learned new vocabulary words from the SC for HRMs and PEDs. Since the ABAB research design was employed in the study, the students in the HRM SC, No HRM SC, PED SC A, and PED SC B groups alternated between 2 weeks of baseline data (traditional PE) in which all of the groups received the same lessons and 2 weeks of treatment data (new PE); the students in these groups received 4 weeks of traditional and the new PE curriculum. The students in the HRM and PED groups (traditional PE) wore the devices and participated in their PE class without receiving this supportive information from the teacher. The students in the No HRM SC group wore a pedometer and received the same SC as students in the the HRM SC group. This group was the HRM control group because the information from this group was be used to determine whether the SC or the HRM device encouraged students to produce more physical activity. One experienced PE teacher taught all of the groups to ensure credibility and reliability.

Steps per minute data were collected from the students in the PED groups. Averages of steps per minute were calculated. Steps per minute and heart rate data were also collected from the students in the HRM groups. Averages of steps per minute and heart rate in beats per minute were calculated and a one-way analysis of covariance (ANCOVA) was conducted for both measurements.

In addition, six students were randomly selected from each group (36 students total) to participate in an interview group. Three students were in each group, with two interview groups per participant group. They were interviewed at the completion of the research

project. The researcher used an unstructured interview. An interview guide was used for each of the participant groups and included the following questions: What is this called (pedometer or heart rate monitor was held up), had you ever seen or used one before the teacher taught you about this device, why do you use this device during PE, what did you learn from using the device, what are some vocabulary words you remember, can you define the words, what did you think of using it, and what was your favorite activity you did with the device?

Finally, the researcher also interviewed the PE teacher to gather additional qualitative data, including background data on her education, certifications, honors, and awards. The researcher also asked the following questions: Please share your first impressions of this research, what did you think entering the project and before you started and after you began the lessons, what are your thoughts on the curriculum piece of the research, what are some of the strengths of the curriculum and devices, what were some weaknesses of the curriculum and using the devices, and what do you think the students thought about the curriculum and the devices? The data from the interviews were analyzed for emergent themes and categories of responses to supplement the quantitative data collected.

Results

The independent variables used for ANCOVA were steps per min and beats per minute. The dependent variables were technology and SC. The covariate used for ANCOVA was Baseline 1. The ANCOVA for steps per minute was significant for technology and SC, $F(1, 100) = 4.520$, $p < .036$, $F(1, 100) = 13.499$, $p < .000$, respectively. The ANCOVA for steps per minute was not significant for technology and SC combined, $F(1, 100) = 3.188$, $p < .077$. The ANCOVA for beats per minute was significant for technology with SC, $F(1, 38) = 14.329$, $p < .001$. The ANCOVA for beats per minute was not significant for technology.

Tables 1 and 2 show the results of the descriptive statistics and ANCOVA of steps per minute (Table 1) and beats per minute (Table 2) for Baseline 1 and Treatment 1 sessions including *n*, *M*, *SD*, *SS*, *df*, *MS*, *F*, and *p* values.

This indicated that the technology and SC separately had a significant effect on steps per minute of physical activity among fourth and fifth graders. However, the technology and SC combined were not as effective. Furthermore, the technology and SC combined

had a significant effect on beats per minute during physical activity among fourth and fifth graders.

Table 1
Descriptive Statistics and Analysis of Covariance for Steps per Minute

Source	*n*	*M*	*SD*	*SS*	*df*	*MS*	*F*	*p*
Technology[a]	20	1005.30	191.916	379810.788	1	379810.788	4.520	.036
SC[b]	49	1098.49	375.394	113494.69	1	1134394.69	13.499	.00
Technology with SC[c]	21	1322.95	210.988	267932.365	1	267932.365	3.188	.077
Error					100			
Total					105			

[a]Includes the HRM group.
[b]No HRM, PED SC A, and PED SC B groups.
[c]Includes the HRM SC groups.

Table 2
Descriptive Statistics and Analysis of Covariance for Beats per Minute

Source	*n*	*M*	*SD*	*SS*	*df*	*MS*	*F*	*p*
Technology[a]	20	131.1167	33.69332	1547.795	1	1547.795	1.906	.175
Technology with SC[b]	21	164.6984	23.27467	11635.464	1	11635.464	14.329	.001
Error					38			
Total					41			

[a]Includes the HRM group.
[b]Includes the HRM SC groups.

The results of the participant interviews revealed interesting information regarding the effect of HRMs and PEDs on the level and amount of participation in PE. The students were asked what they enjoyed about using the HRMs. Student 1 responded, "Just seeing my heart rate because I never really thought of it before." Student 4 added, "How fast your heart rate goes was very helpful" and "It is very hard to find your pulse with your fingers." Student 2 responded, "It's pretty cool to just see how hard you are breathing" and "I thought it was interesting to see a device that can actually show

your heart rate, pretty interesting." They were also asked whether the HRMs had an effect on their participation in PE. Student 1 responded, "No, could still participate in activities without it." When asked whether they would like to wear the HRMs for every PE class, many of the students reported having issues with it working and taking a long time to put on the HRM. For example, Student 5 responded, "It takes a lot of time to put on the equipment." Student 6 added, "I had constant issues with it working."

The students in the HRM SC group enjoyed wearing the HRMs, the researcher asked them why they enjoyed using the HRMs. Student 1 responded, "To find out how hard we were working by looking at the heart rate." Student 2 responded, "To find out how hard we were working by looking at the heart rate, learning something new." Student 5 added, "It was something we had never done before." Student 6 added that the "watch—how you could see heart rate, it showed me if my heart rate was low then it showed me that I wasn't trying very hard." The students in the HRM SC group found the HRMs "interesting, fun and educational. Could use it for different things to see your limit." The students in the HRM and HRM SC group learned eight and 11 vocabulary words, respectively.

The students in the PED groups also enjoyed wearing the PEDs. They knew that the PED was used to measure steps. The students in the PED SC A and PED SC B group understood that the PEDs measured steps, distance in miles, calories, and overall activity for the PE class. The students in the PED SC A and PED SC B groups understood the correlation of acquiring more steps and increased physical activity. The children in the PED, PED SC A, and PED SC B groups learned six, 13, and 12 vocabulary words, respectively.

The researcher found data regarding the effect of HRMs on the level and amount of participation in PE from the teacher interview. According to the PE teacher, "Some of the students were frustrated with the time spent attaching the HRMs and getting them working." When asked whether she thought the students felt motivated to participate in PE by using the HRMs, the teacher expressed a sincere interest in their value to a PE program. Overall, the PE teacher felt that the benefits probably outweighed the negative issues with the students putting the HRMs on in a timely manner. The PE teacher stated, "The pedometers provided motivation for self-improvement in physical education class for each individual." Throughout the interview and implementation of the SC, the PE teacher viewed the PEDs as a better tool to use to motivate the students. Based on the

teacher interview and information from the students in the PED group, the HRMs and PEDs had an effect on the students' participation in PE.

When asked whether she thought the SC was effective, the PE teacher responded, "Yes, the students saw a correlation of rest, active and moderate-intensity physical activity, and the effects on number of steps and heart rate." She hypothesized the curriculum would have an influence on the students' effort for activity level. The PE teacher added that the curriculum "kept students focused" and "[her] students loved the challenge of the PEDs, HRMs and the intellectual challenge of the SC."

Discussion

The purpose of this research project was to fill a gap in the research literature by creating SC for HRMs and PEDS for physical educators to use in PE settings. The purpose was also to determine whether using SC for HRMs and PEDS would increase the level and amount of physical activity in fourth and fifth grade students.

This study showed that an effective PE teacher who is knowledgeable about the content and pedagogy of PE is able to achieve positive outcomes in level of physical activity during their PE classes. As demonstrated with this research, HRMs and PEDS combined with SC had a positive effect on level of physical activity in fourth and fifth grade students. Although amount of physical activity was not increased, the researcher surmised that the children focused on the SC and increasing the number of minutes spent in their target heart rate zone rather than amount of physical activity. The amount of physical activity was the focus of the PED SC and the No HRM SC. The students in these groups increased their amount of physical activity. Ultimately, the PE teacher using SC combined with technology had a positive effect on students' amount and level of PA.

Researchers studying self-determination theory suggested that people who are motivated intrinsically are more likely to continue to participate in physical activity long term and experience higher levels of enjoyment and competence in movements (Ryan, Frederick, Lepes, Rubio, & Sheldon, 1997). The current research study was designed to teach students about level and amount of physical activity in PE class while providing them with immediate feedback from HRMs and PEDs. This combination may have a positive effect on intrinsic motivation, thus leading toward an increased level and amount of physical activity for students who received technology and SC (HRM, HRM SC, No HRM, PED SC A, and PED SC B).

This research indicated that the use of technological devices, SC, and a combination of the two provided by a competent PE teacher may result in increased amounts and levels of physical activity among fourth and fifth grade students. Ultimately, not only do physical educators need to use technology in PE class, but they also need to provide meaningful lessons on how to interpret feedback from HRMs and PEDs.

Conclusions

In designing this study, the researcher took appropriate steps to reduce bias by suitable and adequate sampling, incentives to maximize response rate, random selection (interviews), and a large sample size. Although validity of this study was ensured to a certain degree through these steps, several other factors could be threats. Because this study took place in a small section of the northeast United States, there were several geographical limitations. The limited number of children in one part of the country may not be an adequate reflection of the entire student population of fourth and fifth grade students in PE. In addition, those who declined to participate in the study may differ systematically from those who agreed to participate. One hundred five out of a possible 114 student participated. Nine students declined to participate.

In addition, the data collected were self-reported. The validity of this data could have been improved if the researcher collected them over a longer time. Instead of a 10-week study, data could have been collected over a longer time, perhaps for 12 or 14 weeks, for a greater validity (Baumgartner, Strong, & Hensely, 2002). Furthermore, the data collection was interrupted by several public school holidays, and this interruption in the school calendar may have been a factor. The PE teacher was absent from school for 3 days. This may have had an effect on the data and subsequent results.

Furthermore, HRM printouts from downloadable HRMs were not used to aid in the SC for the HRM SC group as planned. Using the downloadable HRMs and printouts would have provided students continuous heart rate information throughout each PE class. This would have given the students a deeper understanding of their heart rate throughout their physical activity participation. This was due to consecutive class periods and limited data collection time.

In regard to the interview process with the students and the PE teacher, note-taking is a good tool for an adequate record, but it is time consuming, making the interview slower, and may be distracting to the interviewer and respondent (Baumgartner et al., 2002).

This could have led to an incomplete answer to a particular question. In addition, tape recording could have led to a complete account, but some respondents were uncomfortable enough that their answers were inhibited; some individuals and parents refused to give permission to be tape-recorded, and the transcription of the tapes was time consuming (Baumgartner et al., 2002).

The study should be replicated with the following implications for future research with HRMs and PEDS:

1. Researchers should use downloadable HRM printouts for further data collection and evidence of student level of participation in PE.
2. In addition to selecting highly proficient teachers as instructors, researchers need to recruit and train teachers with varying degrees of experience, diversifying into middle and high schools.
3. Researchers may replicate the study with a larger population.
4. Researcher may integrate a classroom component with interdisciplinary written lessons in mathematics, science, English, and health to accompany the SC in PE.

HRMs and PEDS combined with SC are key to the new PE philosophy and should be considered critical tools and motivational devices to combat the lack of physical activity in children. In this study, the researcher found that technology, SC, and a combination of the two had a significant effect on steps per minute and beats per minute for students in the HRM (steps per minute and average heart rate) and PED (steps per minute only) groups. Qualitative interview data from the students indicated HRM and PED vocabulary words used in the research and activities were valuable in comprehending and applying an SC. Ultimately, by using the HRMs and PEDs, students felt motivated to be physically active during PE. Through the SC, students were able to comprehend how to use and interpret information from HRMs and PEDs. Also, the PE teacher used the SC as a step-by-step process of how to incorporate these devices into PE successfully.

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Student-Authored Case Studies as a Reflective Component of Teacher Education

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Abstract

Field experiences are often conceptualized as integral to teacher education programming. However, there are often inconsistencies between the beliefs and values espoused in teacher education and those pre-service teachers encounter in schools that they must navigate to be successful. Among other strategies, writing case studies about their experiences may help pre-service teachers critically reflect on their time in schools. To illustrate the utility of student-authored case studies, data are presented from an investigation involving students in a teacher education seminar course. Results indicate that students believed they benefited from the structure of the writing assignment and thought that writing case studies helped them to prepare more completely for issues they would face in their future careers. A case study written by a student teacher is also presented and discussed. Finally, strategies for introducing and implementing student-authored case studies in PE teacher education programs are examined.

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Field experiences, including student teaching, are integral to student learning in teacher education programs (Schempp & Graber, 1992). These experiences allow pre-service teachers (PSTs) to apply what they have learned during professional preparation and to begin to view classes from the perspective of a future teacher rather than a student. Through a successful field experience, PSTs are able to apply the skills and develop the confidence they will need to transition successfully into the teaching ranks after graduation. However, researchers examining the socializing impact of field experiences have pointed out that the process may be complex. Schools are "custodial bureaucracies" that perpetuate the status quo through formal and informal mechanisms (Lawson, 1983, p. 6). As such, school officials tend to emphasize teaching strategies and procedures that may be at odds with teacher training instructions (Darling-Hammond, 2010; Rust, 1994). Due to this, PSTs are in a difficult position: Should they teach as they were taught to or adopt the practices and beliefs emphasized at the site in which they are teaching?

Among other strategies, writing case studies about field experiences and student teaching may help PSTs critically reflect on the beliefs and practices to which they have been exposed. Similarly, reading cases authored by their colleagues may help PSTs prepare for issues and difficult situations they are likely to face in their field experiences. Over time, instructors accumulate student-authored case studies that relate to specific issues encountered by PSTs in the field to use in seminars and others PST education experiences.

A Note About Teacher Socialization Theory

Zeichner and Gore (1990) highlighted the dialectical nature of field-based learning as well as teacher education more broadly. Such a perspective, wherein socialization is not a passive process and PSTs play an active role in determining their socialization experiences (Templin & Schempp, 1989), is a break from the functionalist view of socialization emphasized by Merton, Reader, and Kendall (1957). Specifically, PSTs assume the lead role in determining what social practices they will adopt or reject (Schempp & Graber, 1992). Some PSTs participating in field experiences may internalize the practices emphasized by their cooperating teachers and other school agents, and others may push back and assert their sense of agency in trying to teach using the practices emphasized during teacher training (Zeichner & Gore, 1990; Zeichner & Grant, 1981).

During field experiences, cooperating teachers (Rajuan, Beijaard, & Verloop, 2007) and students (Conkling, 2003; Hoy &

Woolfolk, 1990) are key socializing agents who influence what and how PSTs teach. To compound matters, PSTs may face conflicting expectations from teachers, students, administrators, and university supervisors, which may cause role conflict (White, 1989). The extent to which PSTs are able to navigate expectations and simultaneously appease school and university partners may be a key in determining their success during field-based learning. In the classroom literature, the cooperating teacher and students have been seen as important socializing agents during field experiences in physical education (PE; Dodds, 1989; Schempp & Graber, 1992; Templin, 1979). Tinning and Siedentop (1985) highlighted the importance of cooperating teachers in helping novices learn teaching behaviors as well as organizational and social tasks within the school setting. Zeichner and Gore (1990) added that since student teachers are often alone with students in the classroom, they serve a particularly important socialization function. Templin (1979, 1981) found similar results in PE and noted that PSTs while interacting with noncompliant students shift their perspective from student learning and achievement to pupil control and compliance.

Case Studies in Teaching and Reflection

Case studies are "richly detailed, contextualized, narrative accounts" of real or hypothetical situations (Levin, 1995, p. 63). The case method is an instructional technique whereby students are asked to read case studies to engage in learning experiences (Merriam, 1988). Through such a vicarious learning approach, PSTs are able to discuss problematic, real-life situations in a nonthreatening environment (Veal & Taylor, 1995). Linked closely to problem-based learning (Collier & O'Sullivan, 1997; Stake, 2000), the reading and discussion of case studies is an opportunity for students to engage in reflection, critical thinking, dialogue, and the development of socially constructed knowledge through group discussions (McDade, 1995; Rovegno & Dolly, 2006).

Beginning in the fields of medicine and law (Engel, 1992), problem-based learning and the case method are now tools in education and are now components of curricula in teacher education programs in the United States (Collier & O'Sullivan, 1997; Darling-Hammond, 2000; Shulman, 1992). The shared inquiry model (Thomas & Oldfather, 1995) has been linked to the effective use of case studies (Harrington & Garrison, 1992; Richards, Hemphill, Templin, & Eubank, 2012). The emphases of this model are the introduction of a focus of inquiry (e.g., a case study), open time and space for dis-

cussion, involving students as valued participants in learning, multiple sources of data and information (e.g., learning from reflection, peers, and the instructor), and reflection and discussion.

Student-Authored Case Studies

Although many teacher education faculty ask students to read and engage in discussions about case studies, emerging evidence indicates that student-authored case studies may be used as a reflective tool. Such an approach is grounded in research, indicating that students may use reflective writing to analyze their teaching and socialization experiences, thereby developing generative knowledge, which is the ability to analyze situations, solve problems, reason, and learn (Langley & Senne, 1997; Resnick & Klopfer, 1989). Richards et al. (2012) noted success in introducing student-authored case studies in a methods course for PE PSTs. The class was structured around the reading of case studies using a shared inquiry approach, and the students were asked to author a case study as a culminating experience. In reflecting on the experience, Richards et al. noted, "Although it may be impossible to prepare PSTs for every situation they will encounter in the field, it may be possible to encourage the development of reflection and critical thinking skills through the case study approach" (p. 52). Also in PE, Wilson and Williams (2001) tied the writing of case studies to reflective practice during student teaching. They noted that students responded positively to the experience and believed that through writing case studies, students were able to deeply explore significant issues that arose during their student teaching. Writing case studies was also an opportunity for students to connect the theory taught during the teacher preparation curriculum to the realities of teaching in the context of schools.

Building upon the work of Wilson and Williams (2001) and Richards et al. (2012), we believe there are numerous benefits to asking students to author their own case studies as part of field-based learning and student teaching. Specifically, we posit that by using such an exercise, students are able to reflect more critically upon issues they perceive to be pertinent during their field experiences. Students may also feel empowered to critique school practices they encounter and discuss the implications of these practices for their socialization and development as aspiring teachers. Furthermore, with the assistance of instructors and peers, students may edit, critique, and rewrite, leading to further reflection and cognitive growth (Richards et al., 2012). The result of this process is the production of a case study that may be shared with future PSTs who are likely to experi-

ence problems similar to those encountered by case authors. Wilson and Williams (2001) noted that student-authored "case studies have enhanced credibility with preservice teachers, since the context of the stories is very similar to what their own future field experiences could be like" (p. 50).

The purpose of this study was to document students' perception of writing case studies and to highlight the case studies that PSTs produce. Three research questions guided the investigation: (a) How do PSTs view the process of writing case studies, (b) what benefits related to case study authorship do PSTs perceive, and (c) what are examples of topics and issues that student authors focus upon in writing a case study? To answer the research questions, we interviewed students in a junior-level PE teacher education seminar, who were asked to author case studies. Then, to illustrate the concerns raised through student-authored cases, we included a case study written by Wesley, a recent graduate of the teacher preparation program at our university.

Method

Participants and Setting

To explore PSTs' reactions to writing case studies, we organized an investigation in which data were collected from 19 PSTs (six female, 13 male) enrolled in a junior-level PE teacher education seminar course. Each student was required to author a unique case study related to their experiences working in schools during early field experiences. The course instructor and teaching assistant also participated in the study as informants.

In accordance with the procedures outlined by Richards et al. (2012), case studies were written in steps to facilitate student progress throughout the semester. PSTs were introduced to the student-authored case study assignment midway through the semester and had 1 week to write a proposal for a case topic that included an outline of the major issues that would be included in their cases. Two weeks after the proposals were due, PSTs submitted a preliminary draft, which was read by the instructors and returned with comments. After making changes based on instructor feedback, each student conducted a peer review by reading a partner's case study and providing feedback. Prior to submission, PSTs met with the instructor to discuss final improvements they could make to their cases.

Wesley, the author of the example case study, participated in the junior seminar and expressed interest in authoring a case study fol-

lowing his student teaching. In introducing the case, it should be noted that Wesley was among the top graduates of the teacher education program the year in which he completed his student teaching. His professors noted his academic accomplishments and evaluated him to be a highly capable young teacher. During his student teaching, Wesley taught elementary PE for 6 weeks as well as middle school health and PE for the subsequent 6 weeks. He wrote this case study about his middle school student teaching experience, where he worked with two cooperating teachers.

Data Collection

Student and instructor interviews. To understand PSTs' impressions of authoring a case study, we conducted end-of-semester interviews with each of the 19 PSTs enrolled in the PE teacher education junior seminar class, a voluntary focus group interview (N = 4 male PSTs) during finals week, and supplemental interviews with the course instructors (N = 2). Individual interviews lasted for approximately 30 min and were in a semistructured format (Patton, 2002). Student interviews were focused broadly on the case study method as a teaching tool, with a specific set of questions about experiences authoring case studies. The focus group acted as a follow-up to the initial interviews and lasted for 90 min. To provide another perspective, we conducted instructor interviews, which were focused on the instructors' view of the case study method and perceptions of students' reactions to authoring case studies. Interviews were audiotaped and transcribed for analysis.

Student teacher case study. Wesley authored a case study and delved into concerns that were raised during his student teaching experience. Having authored a case study during the seminar course, Wesley had a foundational understanding of how to write case studies and needed only minimal assistance. We have included Wesley's case study as data in our study to illustrate issues that student teachers may raise as well as how student teachers may critically examine their experiences using student-authored case studies.

Data Analysis and Trustworthiness

Interview data were analyzed using a combination of inductive analysis and the constant comparative method (Lincoln & Guba, 1985). First, student statements related to writing case studies were separated from the dataset. Once these statements were isolated, they were coded into evolving categories through which the researchers

attempted to capture the essence of PSTs' experiences. These categories evolved throughout the coding processes as new data were coded. The final set of themes shows the essence of the PSTs' experiences in terms of the process of and associated benefits related to authoring case studies.

To derive meaning from Wesley's case study, we read preliminary drafts and provided Wesley with feedback. Feedback was focused on clearing up ambiguities, adding detail, and elaborating on underdeveloped elements of the plot. Once Wesley decided upon a final version of the case study with which he was comfortable, we read the document and made notes related to prominent issues presented throughout the case. These interpretations were the primary form of analysis related to the written case and follow Wesley's case study.

To ensure the trustworthiness of the results, several methodological decisions were made to enhance the research design (Patton, 2002). First, multiple coders were involved in the analysis of the data, which provides for researcher triangulation. Second, data triangulation was achieved through interviews with multiple participants (i.e., PSTs and course instructors) about the same phenomenon using multiple interview styles (i.e., individual and focus group interviews). Focus group interviews were used to conduct member checks with some of the participants and to further discuss emerging themes. Finally, a trained qualitative researcher not involved in the initial coding of the data acted as a peer debriefer by reading the emerging themes and providing feedback related to the degree to which they were logically derived from the data.

Results

We will first report findings from interviews with PSTs in the junior-level teacher education seminar course. As themes are presented, we will provide representative quotations. When quotes are included, we will identify the speaker with a pseudonym. Following the themes, we present Wesley's case study that he wrote in response to his student teaching experience.

Themes Derived From Interviews

Through data analysis, we found that PSTs generally enjoyed writing case studies. Comments such as "I am into my case, I enjoy thinking about it" (Thomas) and "The thing I liked most about this class was writing the case study" (Juan, focus group) are representative of the PSTs' overall response. The two first order themes that

were derived from the data analysis were related to the process of writing case studies and the benefits of writing case studies. Each first order theme had associated subthemes, which are described below.

Process of case writing. In discussing the process of writing case studies, the participants noted two strategies used in the class that helped them to write more effectively. First, the PSTs believed that receiving feedback on their writing helped them to make important refinements to their case studies. The PSTs specifically mentioned feedback from the course instructors and peer reviewer. Derek explained,

> The progression was very helpful. From the point of the rough draft to my final paper I added like three pages onto it. I got feedback from [my classmate] when he reviewed my paper and when I met with [course instructor]. I thought it was very helpful.

In the focus group, Glen explained, "I wrote a draft and edited it and edited it. I kept adding stuff to it after talking to people and stuff… it helped a lot." Neal (focus group) added, "The peer review was a lot more helpful than I thought it would be." Joseph was surprised by how helpful he found the peer review: "[My partner] gave me a lot of advice that I did take and make changes. I think working with a peer is always a beneficial experience." One course instructor agreed that the PSTs "seemed to help each other out with the peer reviews." It appears the PSTs felt the feedback they received from each other and the course instructors helped them develop their case studies beyond the initial draft to produce a more meaningful final product.

In addition to feedback, the PSTs believed they benefited from the structure of the assignment and the progression from outline through final draft. Felix noted, "The checkpoints helped… if there had been nothing due until today, I honestly would have probably sat down and started it last night." By having due dates structured throughout the semester, Carey believed that her case study "was better than it would have been if it was just all due the last day." Thomas (focus group) confirmed Carey's sentiment: "My final copy would have been my rough draft if we didn't have these steps. I seriously would have turned in exactly what I had on the rough draft which was like two pages." Ray noted, "[I want] to make my paper better, which is what the deadlines are there for," and D'Andre agreed that having

deadlines throughout the semester "impacted the way [he] thought about writing [his] case study." Felix noted, that he liked "the steps and [he felt] like [he was] going to turn in quality work because of the steps." Even the PSTs who failed to keep up with deadlines or procrastinated in starting their work recognized the benefit of the deadlines. When asked how he would advise someone who would be taking the class in the future, Joseph said he would recommend "getting started on your case sooner." Patty added,

> I got started on it [the case] in the beginning and then I waited until the last week before it was all due and tried to complete it. If I had completed it ahead of time, then I could have gotten more feedback and tried to make it stronger.

For the PSTs in this study, the structure of having due dates throughout the semester helped them to keep on task and write higher quality case studies.

Benefits of writing case studies. In addition to the benefits of the assignment structure, PSTs believed that they benefited from writing case studies. First, PSTs enjoyed being able to delve deeper into an issue that they saw as important to their future careers. D'Andre noted that writing case studies "builds your knowledge a little more because you are writing it yourself. Others who read it may also find it interesting." Patty noted that writing a case study helped her to understand the complexity of real-world situations that occur in school: "I think it helped me realize that there is always more than one problem to each scenario and that… there are always three or four side problems that will also occur because of the one main problem." Ray added,

> When you sit down and have to stretch out the case study and fill in the details… You have to think like a teacher. There were things that I wrote about that I didn't really consider before starting this assignment.

Neal agreed that writing a case study forced him to think more critically about the realities of life in schools because

> it forces you to draw back on your experiences and other things we have read. There can be good things that come out of pulling from all these experiences and thinking about it and then pulling it all together in one paper.

One of the course instructors confirmed the PSTs' sentiments related to delving deeply into a particular issue: "Writing a case study… gives the students the opportunity to compose something on a topic surrounding a situation, linked to the literature, which has meaning to them."

Beyond delving deeply into a particular issue, participants also believed that through authoring a case study they were able to consider future situations that they may encounter in school. Felix explained that writing his case study helped him think more critically about the role a teacher plays not only in the school but also in the larger community:

> As a teacher, you are part of a community. You have a government job and you are part of a school, you deal with students…people look up to you and people know who you are. You have to be a good person in school and you have to be a role model outside in the community.

In reflecting on his case study, Juan noted, "It kind of got me to thinking about how I would handle it if something like that were to happen to me in the future." Joseph (focus group) added, "I think that having us make our own case studies helped because it made you think about what you might encounter in the teaching field." Sandy agreed, noting, "it helps me think about how this is actually something that could happen and how I should handle it in the future." She went on to add, "Writing the case just made me brainstorm so many things that could happen in my first year or five years down the road." The PSTs' sentiments related to future preparation was confirmed by one of the course instructors, who explained that writing cases prepares PSTs for the realities of working in the complex social settings of schools:

> They realize that issues are complex and that they can't just focus on solving one aspect of an issue without considering all of the angles involved. One decision often leads to numerous other consequences, and I think it is beneficial to their future development to see that as they write.

Wesley's Case Study: What They Don't Tell You About Student Teaching

As I sat behind my cooperating teacher's desk and waited for my sixth period health class to come back from lunch, I could not

help but feel sorry for myself. This was the third week of my student teaching, an experience for which all of my previous education had supposedly prepared me. If I was a well prepared as I believed, then how did it come to this? Two of my sixth grade health classes refused to participate in my activities while my other was more motivated, but too talkative for the class to run as effectively as I would have liked. That week I had already sent one sixth grader to the office, asked another to leave the classroom for being disruptive, rearranged the seating chart, called several parents, and talked to the students about being respectful more times than I could count. I was losing sleep and the fact that the other sixth grade teachers assured me that this sixth grade cohort is the worst they had ever seen wasn't helping. The greatest lesson I learned was that I didn't know as much as I thought I did about teaching and classroom management.

For my student teaching experience, I taught three sixth grade health classes, a seventh grade health class, and two seventh grade PE classes at Community Middle School. Community Middle School was a large school, with over 2,000 students in grades six through eight, and served a small city in the American Midwest. Most students at Community came from low socioeconomic backgrounds and were predominantly white. Students rotated between health and PE every quarter, having class for 42 minutes on a daily basis. My cooperating teachers were Mr. Kramer and Mr. Webster, who were the school's two health and PE teachers.

In order to gain my footing in this school, I spent some time carefully observing my two cooperating teachers for a couple of days before I started teaching. The first thing that I noticed was that my sixth and seventh grade health cooperating teacher, Mr. Kramer, had a different classroom management style than the one I was developing. He seemed to rely most heavily on raising his voice and scolding the students. Mr. Kramer would call out the offending student and either demand that the inappropriate behavior stop immediately or instruct the student to sit outside the classroom. My second cooperating teacher, Mr. Webster, with whom I taught the two seventh grade PE classes, shared Mr. Kramer's affinity for authoritative management. I knew right away that this was going to be a challenge for me because my cooperating teachers' authoritative approach was different than what I was taught at my university, where a student-centered, preventative approach to class management was emphasized. Was it really that much more effective to yell at kids?

After getting the opportunity to observe both of my cooperating teachers for a few days, I was thrust into the teacher role—ready or not. I met my first day with cautious optimism. My strategy was to adopt a similar organizational setup and classroom rules as my cooperating teachers while maintaining the commitment to a student-centered approach to classroom management I had learned in my methods classes. In this way, I hoped to seamlessly transition my instructional style into the existing organizational system.

Seventh grade PE was my first class and I planned to pilot my lifetime sports unit with them. I chose the sports of table tennis, shuffleboard, and bowling. In order to stretch our limited supply of equipment, Mr. Webster and I decided to teach all three sports at the same time using instructional stations. From a management standpoint, I struggled with how I would teach skill progression for each individual activity if my students were going to be doing all three at the same time. While efficient in terms of space and equipment use, the station setup led to my first classroom management challenge: How can I teach and give feedback while monitoring the entire class participating in three different activities?

I brought my concern to Mr. Webster, and he suggested that I teach the rules and basic skills for each activity on the first day and then break the students up into three groups and send them to each station and have them play. I asked how we would work toward skill development and assess learning. Mr. Webster scoffed and mumbled that this was the "real world" and that not everything worked the way they said it would at my university. Beyond the fact that I didn't see how the students were going to learn by just playing games, it was obvious from day one that classroom management would be a huge issue for my unit with the seventh grade PE classes. The students were rowdy, were inattentive, and did not seem interested in learning.

Feeling a little disheartened, I left the gymnasium at the end of the class to teach my first health lesson to a class full of talkative seventh graders. I will admit that for the most part, I really enjoyed my seventh grade health class. While they were a little disruptive at times, they also eagerly participated in most of my activities and seemed interested in learning. They were my easiest class to manage, and for the most part, instruction went on without a hitch.

My first lunch break came as a relief as I could finally relax a bit before my first bout with the sixth grade health classes. Sitting in the break room with the rest of the teachers left me with mixed

feelings. I heard story after story about what happened that day, how many behavior referrals they wrote, and what management strategies they tried that didn't work. Since I was new to the school I stayed quiet, but I listened to the other teachers and soon came to a shocking realization: The seasoned teachers at Community seemed to be having just as much trouble with their classes as I felt I was having with mine.

After lunch, I went back to the health classroom for back-to-back classes of sixth grade health. From the first day with these students, I knew that classroom management and discipline were going to be critical in determining how much I was going to be able to teach and how much the students would learn. Besides the classes being generally talkative and engaging in off-task behavior, there were about eight students in each class who were extremely disruptive on a regular basis. I tried using some of the classroom management strategies I had been taught at my university, but they did not seem to be working as effectively as I thought they would.

At the end of my first day, Mr. Kramer and I sat in his office and talked for almost an hour. I vented about my frustrations of not being able to teach effectively in the two sixth grade health classes that followed lunch. He advised me to take a more authoritative approach to classroom management and to send students to the office if I felt it was necessary. He also insisted that I shouldn't be afraid to raise my voice when the students got out of hand. I found myself increasingly confused because none of the approaches he mentioned seemed to make it into the textbooks that I read. I had been taught only to use extreme measures of discipline as a last resort and not as primary classroom management since teachers are charged with helping all students to learn. A focus on learning becomes difficult if we constantly send students out of the room. Instead, my professors recommended a preemptive approach to discipline that would promote on-task behavior and reduce the need to use reactive classroom management strategies. I should change the educational climate to one that students would be more excited about by keeping them busy by using active learning strategies. If not successful, then I should create a more individualized curriculum to limit the off-task behavior of particular students. If these steps didn't produce the desired effects, then I must keep trying different approaches and communicate individually with students about their behavior. Beyond these strategies, my classes really didn't cover the type of behaviors I was seeing during my student teaching experience.

In PE, I gave into Mr. Webster's advice and made adjustments to better manage my classes at the cost of lowering my instructional standards. I decided to focus on teaching skill progression for the groups that came to table tennis and as long as I never had my back turned on the rest of the students, I felt like I could monitor the gymnasium effectively. I felt bad about not focusing on skill development in all of the groups, but I didn't know how else I could teach effectively and still manage student behavior. The drawback was that I wasn't able to provide any feedback to the bowlers or the students playing shuffleboard. However, this did not help to ease the feeling that the only group I seemed to be reaching was the seventh grade health class.

My relative success with my seventh grade health class was tempered by the constant reminder that my fifth and sixth period sixth grade classes were always looming. Taking my cooperating teacher's advice, I began to be a bit more vocal in my use of classroom management and I scrapped many of my active learning tasks because I perceived they couldn't handle the responsibility of working in groups. For example, I revoked the privilege of using the computer lab to compare fast food caloric and nutritional content online and instead gave them homework activities from their textbook. I also had to stop playing review games before tests because a majority of the students didn't follow my directions, so I had them review terms from their textbooks to study. While I felt as if my college instructors would have frowned upon my decision to let the students direct my management style, Mr. Kramer seemed to approve.

Toward the end of the second week of my experience, I started opening up to the other teachers during lunch break. As I got to know them better, I realized just how frustrated and tired they were of the off-task behavior they encountered in their classes. Mrs. Coleman, a sixth grade math teacher, constantly vented that the students would not finish any homework and never applied themselves in her lessons. The sixth grade social studies teacher, Mrs. Reese, recounted how a tardy student argued relentlessly about being late to her class. Mrs. Reese and Mrs. Coleman agreed that this was the worst sixth grade class in their 20 years of teaching at Community. The sixth grade chemistry teacher, Mr. Craig, shook his head and lamented about the "better days" in years past when parents were actually invested in their children's education.

During these discussions, something really resonated with me. Throughout my teacher preparation we focused primarily on internal

factors related to classroom management (teaching strategies, classroom organization, etc.), and often failed to discuss the important role that parents play in the educational process. I decided to take an active role in connecting with parents and, with Mr. Kramer's permission, I called the parents of four of my most disruptive sixth grade students. Unfortunately, I was unable to get in touch with any of them. When I complained to Mr. Kramer, he laughed and explained that he had given up on calling parents some time ago. I left the school that day feeling more dejected than ever.

At the beginning of the next week, two students in my first period PE class forget their uniforms. Per my cooperating teacher's grading policy, I gave them a zero for participation for the day. By the end of the week, one of these students claimed to have forgotten his clothes three times. I addressed my concerns with Mr. Webster, and he was prompt to conduct a locker search. When the student opened his locker, there was a clean, unused uniform on the bottom shelf. Mr. Webster began screaming at the student in a way that I would envision a prison guard berating an inmate. After dismissing the student, Mr. Webster again insisted that I consider a more direct management style. "I know what your professors told you," he said, "but these students can't handle the type of responsibility you are expecting of them." I can't help to admit that I was starting to question my ideals. While I wanted to develop a climate of mutual respect with my students, things seemed to get done a lot faster when Mr. Webster and Mr. Kramer stepped in and asserted their authoritative management styles. Perhaps the same would work for me.

Midway through the third week, Mr. Webster verbally disciplined one of the seventh graders for not participating while at the bowling station. As I observed the incident from across the gym, I was relieved that he had helped me, but embarrassed that I was unable to handle the situation on my own. I felt like a failure and asked Mr. Webster for advice at the end of the day. He smiled, patted me on the shoulder, and said, "Don't worry kid, you're getting it." During my drive home that afternoon I realized that this type of exchange had become characteristic of my relationship with Mr. Webster. Very rarely did he give me positive feedback or helpful constructive feedback related to my teaching. This disconnect with Mr. Webster wasn't conducive to improving my ability to manage the classes. My professors at the college always gave me feedback (positive and constructive) and seemed to want to help me to become a better teacher. Without this same type of relationship with

Mr. Webster I started to feel like I was the only one who cared about good instruction and improving my classroom management skills.

I hit rock bottom on Friday afternoon and took an ill-advised approach to class management. The fifth period health class was making presentations on how to promote safety in various emergencies. Eric and Marcus were becoming increasingly distracting and other students began following their lead. The presenter, a quiet, attentive, and intelligent girl named Samantha, was becoming visibly frustrated with the class' show of disrespect. After being interrupted for the third consecutive time, Samantha stopped mid-sentence and made eye contact with me as if to ask if I was going to do anything to stop the off-task behavior.

I stood up, walked to the front of the room and stood next to Samantha and asked her to return to her seat. The class, not seeming to realize that I was now standing alone in front of the room, continued to talk and laugh at a joke that Eric had just finished telling. I waited a couple of seconds hoping they would quiet down on their own, and seeing that they would not, I shouted, "Be quiet!" Stunned, the class went silent and the students turned to face the front of the room and stared at me. "It's about time!" I went on to scold until the bell rang a couple of minutes later. I told the students to leave and went back to sit at my desk in the back of the room, not really sure how to feel about what had just transpired. On the one hand, raising my voice was effective. However, I was still not convinced that I wanted to be that kind of teacher.

As I sat there, Mr. Kramer, who had observed the entire incident from the door in the back of the classroom, came over and patted me on the back. "Good work," he said. "Sometimes, you just have to lay into these kids if you want them to respect you." I shook my head and indicated that I had lost my temper and that I was still hesitant up to raise my voice, but Mr. Kramer was quick to point out that I couldn't let class misbehavior get in the way of my ability to teach. While I agreed with his overall message, I was still not convinced with regard to his methods. As an educator, it was my job to teach the health curriculum so that every student could learn. Up to this point, I had not been very successful in this regard, especially with the sixth grade health classes. While I knew that I needed to get control of my PE and health classes, I also wanted to create an environment in which everyone felt respected and comfortable. This did not seem possible when using authoritative management styles as emphasized by Mr. Kramer and Mr. Webster. How was I going to ensure student learning if I couldn't manage my classes?

Analyzing Wesley's Experience

Wesley's case study is an interesting insight into the lived experiences of a student teacher. Like many young teachers, Wesley had students who were powerful socializing agents (Conkling, 2003; Hoy & Woolfolk, 1990). Specifically, Wesley perceived he lacked preparation for managing student behavior, which is consistent with the work of Veenman (1984) and Stroot and Ko (2006), who highlighted the problems that many beginning teachers face when taking control of classes for the first time. For Wesley, this was compounded by a disconnection between the principles for classroom management stressed during his teacher preparation program and those supported by his cooperating teachers. Several times throughout his case, he lamented about the pressure he felt to maintain fidelity to the beliefs instilled in him through teacher training while attempting to appease his cooperating teachers (White, 1989). Related to this disconnect is Wesley's concern that he had cooperating teachers who were generally unsupportive and unwilling to dialogue with him about issues he was facing.

Initially, Wesley exercised his sense of agency in the dialectical process of socialization (Schempp & Graber, 1992) by resisting the influence of his cooperating teachers and continuing to implement the classroom management strategies he had learned during teaching training. Such an approach is similar to what Lacey (1977) referred to as a strategic redefinition approach to socialization in which the individual attempts to change the status quo within the school environment. However, by the end of the third week of his teaching experience, Wesley took actions, sacrificing his beliefs and adopting strategies promoted within the school context. If this trend were to continue throughout the remainder of Wesley's student teaching, Wesley would shift from a humanistic to an autocratic style of management, which has been highlighted as a consequence of student teaching and prolonged contact with children (Templin, 1979, 1981). Such an approach is counter to Wesley's training, which could be evidence of the washout effect in which the values of teacher education are sacrificed because they do not align with the teaching situation (Blankenship & Coleman, 2009).

By expressing their concerns in a case study, student teachers such as Wesley are able to explore more deeply elements of their student teaching they find to be particularly important in shaping their overall experience (Richards et al., 2012; Wilson & Williams, 2001). Through writing a case study, PSTs have an opportunity to

engage in critical reflection through reflective writing (Langley & Senne, 1997). Students may experience cognitive growth through this reflection. Bolt (1998) defined cognitive growth as "the ability of PSTs to identify problems in context and to generate possible solutions for those problems while drawing on relevant concepts and personal experiences" (p. 91); cognitive growth is believed to aid individuals in thinking through complex situations that are common in teaching contexts.

Discussion and Conclusions

Authors and educators have used the case study method as a tool to promote reflection among PSTs (Langley & Senne, 1997; Richards et al., 2012). In a study of pre-service physical educators, Bolt (1998) found that through the case study method, PSTs' may think more deeply about problems in context and offer meaningful solutions. Students and instructors in interviews provided support for the notion that authoring case studies may also lead to cognitive growth. In the descriptions of their experiences, PSTs found case study writing to be challenging but worthwhile. The PSTs believed that writing case studies prepared them for the future and allowed them to focus more specifically on a particular issue they encountered during a field experience or view important to teaching PE. Analysis of Wesley's case study showed further evidence of cognitive growth, as Wesley was able to identify and critique numerous challenging experiences from his student teaching experience. Since future preparation and critical reflection show evidence of cognitive growth, we have included preliminary evidence in this study to support student-authored case studies as a pedagogical practice.

In addition to the benefits of authoring case studies, PSTs who participated in interviews noted benefits related to the way in which the assignment was structured. Specifically, the PSTs enjoyed the feedback they received from the course instructor and other students as they refined their case studies. Peer review is another good tool to make the authorship process a social as well as individual experience. PSTs articulated enjoyment related to reviewing their peers' case studies and exchanging ideas that were mutually beneficial. In addition, they appreciated the project timeline and several checkpoints to keep them on track as they wrote their case studies. This is in line with Richards et al.'s (2012) approach to structuring the authorship process. Teacher educators may use this study as an example to extend the use of student-authored case studies in their cur-

riculum. Furthermore, researchers may further define best practices for using case studies to promote reflection.

PSTs now and in the future may benefit from student-authored case studies. In student-authored case studies, such as Wesley's, students may raise issues that concern many PSTs. When asked, other PSTs may choose to write about issues such as including the individualization of instruction, working with diverse student populations, implementing assessment, and other issues that are relevant to young teachers (Stroot & Ko, 2006; Veenman, 1984). Thus, by engaging in the case writing process, PSTs are reflecting on their experiences and developing a catalog of case studies that are authentic and authored by student teachers (Wilson & Williams, 2001). With the authors' permission, these cases may be shared with future PSTs and discussed in courses leading to field experiences. Researchers should examine PSTs' perceptions of and learning through student-authored case studies to examine this notion more critically.

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PEDAGOGY

Parents' Perceptions of Their Children's Experiences in Physical Education and Youth Sport

Jaekwon Na

Abstract

The purpose of this study was to examine parents' perceptions of their children's experiences in physical education and youth sport. Qualitative research design was employed in this study. Data collection methods included phenomenological interviews and qualitative questionnaires. Forty-one questionnaires were collected and analyzed through inductive analysis method to identify themes. Ten parents (either father or mother) participated in the interview process. Parents indicated aspects of physical education classes (learning life skills, playing time, and health promotion) and aspects of youth sport (learning life skills and health promotion). Parents believed that their children learned more from youth sport than physical education because of deeper understanding in one sport, children's choice of activities, and parental involvement.

A way to connect learning in physical education (PE) with life experience is to use community resources such as sport camps or youth sport programs. In other words, youth sport research in relation to PE is important because students' participation in a youth sport program is a real-life situation where they can connect with their learning in a PE class. Kirk and Macdonald (1998) suggested that the community practice that has a strong substantive relationship to PE is participating in institutionalized sport, exercise, and

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physical recreation. PE and youth sport are both valuable learning environments in which children participate in physical activities. Nevertheless, PE researchers have paid little attention to the connection of these physical activity settings. Thus, one intent of this study was to show the connection between PE and youth sport.

Parents are important teachers and social referents for children (Raudsepp, 2006). Many educators encourage parents to participate in the educational process because they believe that parental involvement is critical in children's education (Wilkinson & Schneck, 2003). Indeed, researchers in their empirical studies have revealed that students experience positive outcomes in terms of learning and academic achievement in many subjects due to parental involvement (Anderson & Minke, 2007; Green & Walker, 2007). The starting point of parental involvement may be their perceptions of or beliefs about school subjects and educational topics. Therefore, understanding parents' perceptions of or beliefs about education is essential because they influence educational policy and the particular nature of schooling (Sheehy, 2006). In addition, children's perceptions of their parents' beliefs are significantly related to their own beliefs about their sport involvement (Brustad, 1996). Despite this importance, there is little literature related to parents' perceptions of or beliefs about their children's experiences in PE classes.

Likewise, little is known about parents' perceptions of their children's experiences in youth sport programs. Instead, many researchers mainly focused on parents' effects on their children's motivation, achievement, and competence (Bois, Sarrazin, Brustad, Trouilloud, & Cury, 2005; Eccles, 1993; Fredricks & Eccles, 2004; Ullrich-French & Smith, 2006). In addition, some researchers concentrated on coaching preferences of parents (Martin, Dale, & Jackson, 2001), parents' perceptions of youth sport and interference with family time (LaVoi & Norris, 2011), and parents' inappropriate behavior at youth sport events (Holt, Tamminen, Black, Sehn, & Wall, 2008; Kanter, 2002). Although these researchers primarily examined the effects of parents on children's experiences, there is a limitation because they excluded in-depth information about parents' perceptions of their children's experiences in a youth sport program. Gould (2002) suggested that researchers should employ qualitative research methods in youth sport research to obtain detailed information and depth of understanding not available from traditional quantitative methods.

In short, little attention has been paid to parents, although they directly influence children in their experiences and learning in physical activity settings. Thus, examining parents' perceptions of their

children's experiences in PE classes and youth sport programs is necessary. Based on these rationales, the purpose of this study was to examine parents' perceptions of their children's experiences in PE and youth sport. Through this study, PE teachers, youth sport coaches, and researchers in both areas will better understand parents' experiences in and perspectives on PE and youth sport, which could lead to enhanced provision of quality education through physical activities.

Method

Qualitative research design was employed in this study. A major data collection method was phenomenological interviewing, wherein the purpose was to explore and gather experiential narrative material that may be a resource for developing a richer and deeper understanding of a human phenomenon (Van Manen, 1990). In addition, complementary data were collected through qualitative questionnaires, which consisted of seven open-ended questions. The results from these questionnaires were used to construct the phenomenological interview questions and to gather descriptive information about parents' perceptions. Data collection procedures were as follows: The researcher visited youth sport programs located in a small college town in the southern United States. Based on convenience sampling, the researcher asked registered parents to complete a qualitative questionnaire through a face-to-face meeting. Forty-one questionnaires were collected and analyzed through inductive analysis method to identify themes (Grbich, 2007). Of parents who completed the questionnaire, 10 parents (either father or mother) voluntarily agreed to be interviewed and participated in individual phenomenogical interviews. Three 1-hr interviews for each participant were conducted. Each interview was focused on (a) overall perceptions of their children's experiences in school, home, PE, and youth sport; (b) comparison of experiences in PE and youth sport based on the first interviews; and (c) summary of two previous interviews. Interviews were audio-recorded and transcribed. Data were analyzed through phenomenological analysis processes (Hycner, 1985). Each step of data analysis was as follows: transcribing the data, completing the phenomenological reduction, listening to the interview for a sense of the whole, delineating units of general meaning, delineating other units of meaning relevant to the research questions, clustering units of relevant meaning, and determining themes from clusters of meaning. After this analytic process for each interview, the researcher returned to the participant with a written

summary and themes to increase credibility of data. The researcher checked whether the research participant agreed that the essence of the interview was accurately and fully captured (Hycner, 1985).

Findings

The purpose of this study was to examine parents' perceptions of their children's experiences in PE and youth sport. To examine parents' perceptions, the researcher used phenomenological interview data. Van Manen (1990) mentioned, "From a phenomenological point of view, to do research is always to question the way we experience the world, and to know the world in which we live as human beings" (p. 5). Thus, the goal of this study was to question the way parents experience PE and youth sport and to know PE and youth sport in which parents live, that is, to know the personal meaning of PE and youth sport to them in their life. To attain this goal, the researcher listened to participants' personal experiences, their stories, events, episodes, and situations. Also, the researcher explored what those experiences mean to their daily lives. For example, to understand their perspectives on PE, the researcher asked what the similarity or difference is between PE and other subjects and how PE contributes to learning in school life.

Participants' Background

Ten parents (either father or mother) with children aged 12 to 15 years participated in this study. Their children had experiences with youth sport in O County Park and Recreation (OCPR), YMCA, or YWCO. Two parents had served as a volunteer coach for their children's soccer teams. The basic demographic information about the research participants is shown in Table 1.

Table 1
Basic Demographic Information of Parents

Parents	Age	Occupation	Highest level of education	Household income
Father	47	Speechwriter	Master's degree	$100,000 or more
Mother	42	Nurse manager	College/ university	$100,000 or more
Father	45	Technician	College/ university	$100,000 or more
Father	47	Lawyer	Master's degree	$100,000 or more
Mother	34	Housekeeper	High school	$40,000 to less than $60,000

Table 1 (cont.)

Parents	Age	Occupation	Highest level of education	Household income
Mother	38	Researcher	Doctoral degree	$40,000 to less than $60,000
Mother	43	Housekeeper	College/ university	$40,000 to less than $60,000
Mother	43	Housekeeper	College/ university	$40,000 to less than $60,000
Mother	47	Housekeeper	High school	$40,000 to less than $60,000
Father	37	Assistant professor	Doctoral degree	$40,000 to less than $60,000

Perception of Physical Education

From a parents' viewpoint, PE, as a part of school curriculum, is an important subject to contribute to the promotion of students' physical health and cognitive, psychomotor, emotional, and social development. Parents seemed to agree that PE is a valuable subject as a part of total education. One parent explained,

> I think it's an important part of a total education. I think it's important for them as a part of total education to understand health and fitness, to be exposed to a lot of different activities and different games and different sports. I think, you know, I think particularly in elementary school, it's just important for them to sometime during the day just to be able to run around and play and not just be sitting; particularly for boys it's important to have that. But I think it's a part of an overall education to understand the health and fitness aspect. (John's father interview transcript)

In particular, parents indicated the following aspects of PE classes: (a) learning life skills, (b) playing time, and (c) health promotion

Learning life skills. Understanding parents' perspective on learning from whole school life helped the researcher talk about learning from PE because parents regarded PE as a part of total education. The following episode is representative of parents' views on their children's learning in school:

> I remember one day in sixth grade which is the first day of middle school. Drew was standing around a group of boys and as happens in middle school, a little fight broke out. And

> Drew, trying to do the right thing, went to try to break the fight up. Well… by the time the teacher got there it looked like Drew was in the fight and they had to work all that out, and he and I talked about how I liked how you wanted to do the right thing, but the thing to do when there is a fight is to go get a teacher. Because nobody can tell who's in the fight and who's trying to help when everybody is in a big pile. So I think those are… outside the subject matter. Those are the kinds of experiences and lessons they can learn. (Drew's father interview transcript)

Parents believed that their children learn not only knowledge of each subject but also life skills to deal with conflicts through social interaction at school. Parents valued the social development in whole school life:

> One of the important things you learn in that process [school] is you're not gonna like everybody you have to deal with in life. And so you have a teacher you don't like. You know I have had bosses I don't like. Conflict among friends and peers, we've had some conversations about being careful, being truthful, and not getting involved in someone else's problem. (Drew's father interview transcript)

> I think the interacting. Especially with Russ, our oldest one going from middle school to high school kind of learning that social hierarchy that goes with that, and it's the same if you go to a job or anything else. They learn about the customs and the culture of our little community, how they need to behave here… I think just learning how to behave in a society is one of things. (Robert's mother interview transcript)

PE is a school subject that is used to teach students responsible social behavior such as etiquette, cooperation, teamwork, ethical behavior, and positive interaction. Parents believed that PE as a part of school life contributed to their children's social learning process through cooperative activities. In particular, they believed that through team sports in PE classes, students learn how to interact with a teacher and teammates as a team member. Two parents explained,

> I always thought like they had someone in PE that they enjoyed the coach, that they enjoy the activities with the other children. It was almost always team activities or group activities; it wasn't really individual skills. So the team might be working in groups together and having fun with physical activity… there is a social element of that, of working together in physical education. (Richard's father interview transcript)

> Well I think most of what they do in the physical education classes are team sports, so they learn how to interact on a team and they learn, hopefully they learn the positive way to behave when it comes to somebody is stronger in sport than another, and encouraging and accepting everybody for what they can do… (Joseph's father interview transcript)

Playing time. Although some parents believed that PE deals with educational issues such as teamwork, some were not able to state what their children learned from PE. Rather, they thought their children played with other classmates in PE classes. Some parents believed that PE is playing time rather than learning time. They explained,

> Well, I don't think they learned something from PE in middle school… In elementary school, he was playing and running with other kids… I have seen him running here and there at the gym… Definitely he had fun…He began swimming [at YWCO]… but I don't know they learned something about physical from PE. (Mark's mother interview transcript)

> PE is more for fun and a lot of goofing off, whereas the youth sport is more of a competition. And there is more of a goal to do something. I mean a lot of the physical education is more just hanging out with your buddies and goofing off. (Rose's mother interview transcript)

In particular, parents thought their children played rather than learned in elementary level PE. However, they understood the nature of PE classes changes according to grade level. They explained that doing many activities is the main intent of PE at the elementary level and that it changes into health education at the secondary level:

> In elementary school, they got exposure to a lot of different activities and I think that is the intent of it. They got to play a lot of different sports and learn a lot about different sports. I think the idea of teamwork and what it means to be on a team. (Drew's father interview transcript)

> In middle school, it becomes a different kind of subject matter. It's something they can choose to take, and it's also paired with health with… is also sex-edu… In elementary school, it was pretty much chaos because they get a lot of kids in a gym playing around and doing a lot of things. So it's loud and crazy. But because it's more of a health and sexual education class in middle school, I just see more of a classroom setting. I don't think they're really doing PE in middle school. Now I could be wrong, but I think the emphasis is more on it's an academic, personal hygiene, personal fitness, diet, that sort of thing, so it is more of a classroom. (John's father interview transcript)

Health promotion. An aim of PE is to promote health and physical fitness by teaching and encouraging physical activities. The findings from the qualitative questionnaires indicated health promotion to be the most important benefit that children gain from PE. Parents believed that PE is an important school subject to promote individual health or physical fitness:

> I think physical education program that they have at school, I feel like their goal is to educate them more the benefits of physical conditioning or ways of maintaining physical conditioning, nutrition, and the whole thing. I think that is sort of their goal is more of lifelong to teach them stuff they can use for the rest of their lives… I think the difference [from youth sports]… being just teaching them the benefits and how to as far as physical fitness regardless of a sport. (Joseph's father interview transcript)

> Well I think long term… if taught properly it can help develop long-term awareness of your health and better health. It teaches you different ways of exercising... it introduces the physical activities. And giving them [children] a few minutes to get away from math and science gives their brain a

rest, gets the blood circulating… (Richard's father interview transcript)

Parents seemed to understand the basic principle of physical fitness and believed that their children were able to learn and acquire a habit of physical activity from physical education classes. In particular, they stressed that early experience with exercise leads to lifelong participation in physical activities:

> I think kids should take PE class in school… because exercise is a kind of habit… so if they don't take PE in early age, they cannot do exercise… When I was a student, I was sick often, so my PE teacher made me doing exercise, so I physically felt better and it helps me study… you know you cannot study for a long time without physical fitness. (Mark's mother interview transcript)

Physical fitness has long been an important goal of PE. Indeed, parents considered fitness tests an important part of the PE curriculum. One mother indicated that she talked about PE with her child:

> He [Robert] doesn't really talk about any sport that they do at school. It's more he talks more about the physical fitness test that they do at the beginning and at the end. The days he has to do the long mile after mile in eight minutes or when he has to do sit-up and pull-up... I don't really hear him talk about any sport. (Robert's mother interview transcript)

Perception of Youth Sport

Parents' perceptions of youth sport may be an important predictor for their children's participation in a youth sport program. By understanding how parents perceive youth sport, professionals in the fields of PE and coaching education could increase the quantity and quality of physical activity programs. The findings of parents' perceptions of youth sport were divided into two major themes: learning life skills and health promotion.

Learning Life Skills

Parents believed that their children learn life skills through participation in youth sport. The following transcripts show parents' perspectives on the major benefits gained from participating in youth sport. Parents indicated how their children learned life skills from youth sport:

> I think the value of sports is good value for life. So I think in some way it probably does help their academic life. I like to see them get better, and I like to see them improve in whatever they're doing, whether it is school work or sports. So I like seeing improvement, I like seeing them commit to something and carry out that commitment, and again, I think that is an important value that extends beyond sports as well. (Drew's father interview transcript)

> It [playing sports] teaches them a lot about winning and losing and sportsmanship and how to get along with folks, and I think it's good for their social growth… Learning to deal with other people, which is also our job to teach them… learning to play as a team, learning to accept other people's inadequacies or the fact that somebody may be better than them and they get to play more fair play, and I just think that is a benefit to them. Plus, our oldest son, his life revolves around social activity; he just wants to be with his friends all the time, and so it gives him a chance to be with his buddies. (Joseph's father interview transcript)

Parents who participated in interviews strongly believed that social development is one of the most important life values their children have to learn inside and outside of school. Also, a top benefit and motivation of sending their children to a youth sport program was social development. Data from the questionnaires show that social development (45%) is the most important attribute children should be learning through participating in a youth sport program. The most frequently noted subtheme in the transcripts about participating in a youth sport program was being a team member or learning teamwork. Making friends and acquiring sense of community were also subthemes under social development.

Parents believed that through youth sport experiences, their children learned life skills related to social development, including respect for and working with others. In particular, participation in team sports such as soccer and basketball was a great source for learning about working as a team member. The following quotes show how much parents value their children's learning experiences that involved teamwork, which they considered an important life skill. Drew's father explained that the best moment in youth sport was when his children displayed true teamwork:

> I think the moments I'm most proud of in sports are when they show true teamwork. Where the decisions they make and the things they do are driven by what's best for the team. So in basketball, it might be making a pass rather than taking a shot, or an assist in soccer or if your coach puts you in a position that you're not used to playing, then you just do… So those are the kind of values I want them to have as a part of a team, that the team is more important than you.

Other parents also agreed that their children learn teamwork through participating in a youth sport program:

> I think learning to be part of a team is important. I think some level of commitment to a team and saying I will be there at these times, I will commit to doing that… I think they learn what it means to be on a team and what your responsibilities to the other people on the team are. I think they learn about working hard. I mean just classic values of commitment and teamwork and working hard. (John's father interview transcript)

> You know that I think it's important for them to learn to be a part of the team or a part of the group. I think in life most of the time you're going to be working with other people. So the skills of working with other people, appreciating other people's strengths and your own strengths, and working on weakness to get better, but the idea of how a group of people works together to accomplish a common goal is part of what they learn in youth sports. I think it does definitely have application to their life in everything they do. We're always going to be around other people. (Joseph's father interview transcript)

> Because you know again they have the opportunity to meet kids and work together as a team and you may meet some kids through youth sports that he wouldn't have met at school. (Brian's mother interview transcript)

Parents whose children played team sports pointed out that youth sport is an activity in which their children are able to learn social life skills such as teamwork. On the contrary, parents whose children participated in individual sports such as swimming and taekwondo

stressed learning self-discipline through participating in a youth sport program. Parents believed that their children could apply self-disciplines such as patience to their daily lives. They explained,

> He feels self-achievement [through swimming training]… He learns patience and self-control after finishing the hardest practice… so he can stop playing video game by himself, and he wants to be prepared for all other things like playing piano, reading, and doing homework. (Mark's mother interview transcript)

> I think they also learn a lot of discipline, self-discipline. How you have to apply yourself, you can't just show up and expect to be successful, you have to do something to make it happen. (Rose's mother interview transcript)

Data from the questionnaires also showed a similar theme related to self-discipline such as developing sportsmanship and learning through competition.

Health Promotion

Active participation in physical activities is good for children's health and well-being. Parents in this study agreed that their children experience physical health benefits from participating in youth sport.

> I think the physical activity is important [for kids' health]. Certainly I think being in good physical shape helps your general life. So I think that is important. (Thomas's mother interview transcript)

> I like it when they play sports; it keeps them somewhat healthy. (Rose's mother interview transcript)

> It [playing youth sports] gives them a physical outlet to burn off some energy to help keep them in physical condition. Health benefit is one of benefits to send our kids to youth sports. (Joseph's father interview transcript)

Parents could not explain the process of how physical activities maximize personal health. In spite of a lack of health-related knowledge, parents believed their children experienced physical health

benefits from participating in physical activities in a youth sport program. Indeed, parents' personal experiences made them think that being physically active is beneficial to their children's physical health. Parents talked about their past experiences to explain the importance of their children's physical health:

> I think the idea of physical fitness is interesting. I've gotten more active in the last two and half, three years. I've realized that I was getting a little heavy and I wasn't active, and so I started doing a lot more running and bicycling and swimming and doing all that. So I think it's important for them to be active... I think it's important just to go out and play without structure without somebody telling them what to do without necessarily being on a team with sports, and then I think it's important to be physically active in the context of an organized sport. (John's father interview transcript)

> I thought I have to let my kids do exercise even before I got married. I was weak when I was a student, so I knew the importance of physical fitness. And because I strongly believe that sound mind from sound body. (Mark's mother interview transcript)

Data from questionnaires were in line with these interview transcripts. Staying active (16%) was second most frequent subtheme.

Connection Between Physical Education and Youth Sport

From the questionnaires about the relationship between PE and youth sport, 17 parents thought there was no relationship between them. By participating in these, children have active, healthy lifestyle. However, other parents indicated differences between them. For example, PE is a more general, health-focused program and scaled-down version of youth sport. By contrast, youth sport is a more specific teamwork-focused program. Also, parents believed that youth sport is an opportunity for parents to be more involved in a program and for parents and children to become acquainted with other people.

Parents believed that their children learned more from youth sport than PE. One mother commented that she was not concerned about the possibility of no PE in the school curriculum at her child's

school. However, she did not want to imagine a life without youth sport. She felt that youth sport could be a substitute for PE:

> I think that, in our case with Robert, he has an opportunity to play and do other sports outside the school PE program, and because I guess of my comfort level with talking to them about other things that they do in PE… if all of a sudden they decided he couldn't have PE at school, I don't think that would be something that upset us a lot because we know he would have an opportunity to do it somewhere else. However, if he was in a situation where we did not have youth sports, then it would become very important. (Robert's mother interview transcript)

Reasons parents believed their children learned more in youth sport than in PE included deeper understanding in one sport, children's choice of activities, and parental involvement.

Deeper Understanding in One Sport

Parents understood that PE, as a part of school curriculum, includes topics such as health, fitness, sports, games, motor skills, and psychosocial development. They did not think that their children could learn all of these in a limited time. Therefore, they believed that their children learn more in youth sport by playing one sport and acquiring a deeper understanding of it. Parents explained,

> I think… [they learn more in] youth sports because it's learning the levels and layers of one activity over a period of time. Certainly in PE they learned a lot of different things and they had exposure to a lot of different games, which I think is good and important, but I think over time, with Jon and Drew with soccer and Tom with basketball, because now you're talking about multiple seasons of playing and seeing what they've learned and seeing how more sophisticated their understanding of their particular sport has become over that time, they've learned more through the focus of playing one sport over time. (Drew's father interview transcript)

> I think with the PE at school, there is a curriculum, you know. You're not really trying to teach them to perfect their skills. They just learn how the game is played. Where in youth sports they come with some expectation that you

know pretty much how the game is played and the rules. And you really are working around more on their skill, you know their ability to play the game, and then youth sports are totally centered around the sports that they're coming in to play. (Joseph's father interview transcript)

Because you spend more time with one sport in the course of a season in youth sports or sports, so you would learn more deeply about that sport over the course of the season playing one sport. (John's father interview transcript)

Children's Choices of Sport in Youth Sport

Parents believed that their children could learn life skills through youth sport. When asked why parents chose sports over other educational programs for their children to learn life skills, they answered because their children chose a sport. Although the original impetus for participating in a youth sport program came from their parents, students chose sports more than other activities. They explained,

So primarily it's been their choice that they enjoy sports. If they enjoy playing, I mean we are about to have four kids on five teams for the next two months. Thomas will play two soccer teams, school and club. Tom will do track pole-vaulting, and Jon will finish out basketball season and play tennis at school. So that has been their choice to play sports. (Thomas's father interview transcript)

Parents' preference for a certain sport was not transmitted to their children. For example, Robert's parents were faithful baseball fans, but their son dropped baseball from his list of youth sports. Robert's mother explained:

My husband's brothers played baseball, so I knew I would probably get my kids started in baseball. Robert played one year of Tee ball and one year of baseball and he did not like it. So he did not play anymore baseball, but he really likes basketball and taekwondo.

She also explained why Robert chose basketball and taekwondo instead of baseball:

> But he started taekwondo at an early age and I think he was very impressed with how far you can go with it. And I think he was pretty good at it, and I think with baseball it was just too slow because he played it one year.

The story of this family shows that child's choice of athletic activity is important for their enjoyment and continuation of youth sport activities. This study shows that parents do not need to provide a model of sport preference or participation. However, Robert's parents encouraged their children to participate in what they wanted to play. That is, they influenced their children's involvement in physical activity through encouragement:

> He played football last year in middle school and he liked it, but he said it got in the way of his taekwondo; he didn't have time to do both so he prefers the taekwondo… We're really big baseball fans, but we've encouraged them… if that's what you want to do, then we've encouraged them to do it. Like Robert is not interested in playing football, so that's fine if he doesn't want to play; we're not going to try pushing him into it. (Robert's mother interview transcript)

Robert's parents seemed to keep an appropriate balance in terms of parental expectation. A case from Robert's family showed how a child's participation in a youth sport program begins and continues through the interaction among family members:

> After the first year, I think they had no idea until we took them the first year, and after that, Robert was very quick to tell me he wants to get signed up for basketball every year and taekwondo. It's kind of become a habit now; I mean they know each season is coming. (Robert's mother interview transcript)

Parents believed that their children may not enjoy PE, compared to youth sport, because it is mandatory. They thought that having such an obligation was a restraint to enjoy PE classes. Parents believed their children preferred youth sport to PE because they chose their sports. Parents assumed their children followed teachers' direction in PE classes rather than actively seeking autonomous learning:

> With the PE classes at school, it's everybody. You don't have a choice of whether you want to take that class. People that

> rarely love it are there and people that hate it and just do it because they have to be there… so I think it's not really a love of a sport as much is it having to do a certain curriculum. (Joseph's father interview transcript)

> Physical education as opposed to youth sports, typically you sign up for youth sports that you're interested in… where physical education you follow curriculum, so you may have to play some sports you're not really interested in or not really good at. (Larry's mother interview transcript)

In addition, the researcher found, from parents' viewpoint, students are less likely to be involved in PE classes because they did not select the activities they wanted to play:

> One year they did lacrosse or something [in PE]. I mean he didn't care about that. He just did it because he had to do it. But I think that they tend to learn more what they want. And youth sports they signed up for that because they love the game. (Thomas's mother interview transcript)

> I have to think you know with PE there might be a few things that the kids would not necessarily try for whatever reason; you know, they think they couldn't or think it would be silly, but they have to in PE, so that kind of gives them a chance to learn something they wouldn't pursue. I remember in the seventh grade we had to do a unit on square dancing. And I would have never done that in my life. (Robert's mother interview transcript)

Parental Involvement

The biggest difference between youth sport and PE from parents' standpoint was the level of their involvement in their children's experiences. Parents believed that through a youth sport program, they have an opportunity to interact with their children. Through participating in a youth sport program, family members bond because they "all go together and ride home together and talk about what happened and things that maybe happen to do differently next time" (Robert's mother interview transcript). Participation in a youth sport program leads family members to spend time together. This was evident in two parents' responses:

> We go to… we play a tournament in Atlanta or we play two games on Saturday and one on Sunday, so you might have time to spend together. So a chance to go on for a weekend with children for some other activity has been really a lot of fun. And I think definitely a bonding experience. (Joseph's father interview transcript)

> It is certainly one of the ways that a part of my relationship with my children has developed, particularly because I coached all of them. I think that is an opportunity to have a particular relationship and a particular set of memories with each one of them. I know it's important to me and something that I value and I hope that they value too, but it's time spent together doing something we both enjoy. (Drew's father interview transcript)

Parents agreed that through youth sport participation, family members bonded through having a chance to talk with their children. In particular, parents listened to their children after practices and games. Listening to children's stories about practice, game, or competition is an important form of parental emotional support. They explained,

> As a parent usually I try to listen to what they're saying, to what they're talking about the game, if they were happy or unhappy, and as they've got older, those conversations have gotten better because they do understand more about the sport, about the game, about what went well, what didn't go well. (John's father interview transcript)

> Richard and I talk about the kinds of things the team needs to do and each player needs to do to make sure that we play a full game. I try not to start the conversation. I like to talk, so it's hard, but I really want to listen to what he says… and I wanna respond to what they say, and if they want me to respond, I wanna respond to them. (Richard's father interview transcript)

Every parent was concerned about their children playing too many video games and watching television when they described their children's routine of life. Parents took for granted that their children play video games in their leisure time. They said,

> A lot of times when we don't have a game, we kind of all get in the house and we get in different parts of the house. You know the boys will be upstairs playing video games or that sort of thing. So I think we have more conversation with them on the days there is a sport activity. (Thomas's father interview transcript)

> You know they are teenagers and so they're playing video games and talking to their friends and playing on the computer. (Robert's mother interview transcript)

> If they got a free time, what are they [children] gonna do? They play a video game and watch TV… He has no time to do [video game] because he has to swim… He plays a video game only during the weekend… if he could have a spare time, I am pretty sure he wants to play a [video] game and watch TV. (Mark's mother interview transcript)

From parents' perspectives in this study, children spent time efficiently through participating in a youth sport program. Parents believed that a benefit of youth sport participation is their children use their free time well.

The following interview transcript from a father showed how much his child's participation in a youth sport program signified an important and valuable activity to his family. He said that youth sport forms his family's identity:

> It's almost our identity because we have done it so much and every season except for summer, and now Tom does tennis in the summer, so every season where somebody is playing a sport and it's been up to this point mostly been sports, and so it's sort of a common bonding experience. It's something we can all share. We can all enjoy in different ways. And something we can all be proud of. (Drew's father interview transcript)

Furthermore, not only family members bond through youth sport but also community members through having an opportunity to interact with each other in youth sport. Children may first be introduced to sport by their parents. However, as they continue to participate in sport, the direction of influence may be reversed; that is, children may influence their parents' involvement or adjustments in

lifestyle. For example, for children's participation in a youth sport program, parents have to fill out enrollment forms, wash uniforms, drive children, and most important, watch children's practices or games. Parents in this study believed that they met other familiar or unfamiliar families and constructed new relationships with them during children's practices or games. This process of parental socialization contributes to building a sense of community. One parent indicated,

> Well, I think we enjoy going to the games because just like the boys have the same kind of friends, a lot of parents have become our friends; either we've knew them from before or we've gotten to know them better through sports. So my parents live close to us, so they come, so it gives us an opportunity to see family. They can come see the boys, and I mean it's a big part I guess right now socially, most of what we do outside of work is around a sport that one of the boys play. Go and be with other families. (Thomas's mother interview transcript)

In addition, a father believed, based on his personal experience, that participation in a youth sport program helps people to have a sense of attachment to community:

> I think it gives them a stronger tie to the community because where I grew up, I grew up in a small town and I was never allowed to play youth sports. I was in a small private school and then left home, when I got out of high school and went to college, so now when I go home to visit my parents, I don't know anyone there. So I don't feel a real strong tie to my community just because I never did anything there… I mean they know kids they don't go to school with, and I think it gives them a strong tie to their community. (Joseph's father interview transcript)

Characteristics of moderate levels of parents' involvement include attending children's practices and games and providing social support (Hellstedt, 1987). Parents who participated in this study showed characteristics of moderate involvement in youth sport. However, they indicated a lack of interest in PE. One parent said,

> [In youth sport] talking to them especially after games, after practices. Again a lot of this is inferred; you just assume

this is where they're picking this up. We go to a lot of their practices, and you see the way they behave at practice or at games and it seems to be more obvious [than physical education]. (Joseph's father interview transcript)

In addition, Robert mother's description of PE and youth sport showed how she was more involved in youth sport than PE. When she described her son's routine of PE classes, she used her imagination. On the contrary, she was able to describe youth sport more vividly and actively than PE because she participated in youth sport with her child. She discussed PE and youth sport:

Physical education: Well, they [students] have to change clothes, so I know that he has to change clothes, and it's boys and girls together I think in middle school, so I think they change and go and the teacher tells them what they're doing for the day, and I imagine Robert is breathing hard and sweaty.

Youth sports: For Robert, his games usually start at 7:00, so he gets home from school those days on the bus. He gets home about 4:30, and that morning, I say, "You've got a game. I'll pick you up. Get your homework done." So we leave our house about 6:15. Coach Eric likes them to be there about 15 minutes early. We'll go to the gym, and Robert gets out of the car and goes in and I come later and we watch the game and then usually a lot of nights after a game, we'll go through Zaxbys or something and get them something to eat afterward and come home. On the way home, he talks about… we talk about how many points he had and whether they won or lost or what coach Tony was saying and, you know, if anybody fell down or whatever. We'll talk about if they got hurt and if Robert got to throw free throws; we'll talk about whether or not he was nervous… He always calls his dad on the way home and tells him what the score was and how many points he scored. (Robert's mother interview transcript)

Finally, another difference between PE and youth sport is that parents are able to recognize their children's learning directly or indirectly. In other words, parents see children's learning directly in youth sport settings and know it indirectly in PE from grades and

conversations with their children. One parent indicated the different views on recognition of students' learning in two settings:

> How to know children's learning in youth sports: Well, I watch them play. And what I see and would like to see is the level of complexity that they understand about the games they play from five years ago to today. They not only learn the physical skills of the game but some sophistication and complexity about strategy of a game, how the game should be played, what response you have to certain situations, and decision making. So I can see those particularly in the team sports they've played that they have a much deeper understanding of the game itself in addition to the physical abilities that they've improved. (Drew's father interview transcript)

> How to know children's learning in physical education: Well, I see their grade. And we assume their grade is a reflection of how well they performed in the class. We have some conversations and we talk to them about what they're learning, but that's at the time that they're at the class. It is an interesting question how do I see, what did I carry beyond the moment of learning in the academic setting. I don't know. I've never really thought about that. Beyond the grade, beyond the conversations we had at the time, I don't know how to measure that. (Drew's father interview transcript)

Data from questionnaires and interview transcripts about parents' perceptions of two physical activity settings is summarized in Tables 2 and 3.

Table 2
Summary of Questionnaire Data About Parents' Perceptions of Youth Sport and Physical Education

Aspect	Youth sport program (198, 100%)	Physical education program (24, 100%)
Physical	Staying active (32, 16%)	Health promotion (8, 33%)
	Learning sport skills (13, 7%)	Learning diverse sport rules and skills (9, 38%)

Table 2 (cont.)

Aspect	Youth sport program (198, 100%)	Physical education program (24, 100%)
Social	Being a team member or learning teamwork (49, 25%)	Team play (2, 8%)
	Making friends (25, 13%)	
	Sense of community (15, 7%)	
Affective	Fun (22, 11%)	Fun (4, 17 %)
	Sportsmanship (21, 10.5%)	Sportsmanship (1, 4%)
	Learning through competition (11, 5.5%)	
Other	Other (10, 5%): Self-discipline, aggression out, responsibility, self-esteem, how to work toward a goal, effective listening and following direction, deal with disappointment, value of exercise, sport as a microcosm of life, and how to challenge themselves and understanding limitation.	Four parents (of 41) answered that learning in the two settings is the same. Thirteen parents (of 41) left it blank or answered that they were not sure about learning in physical education classes.

Note. (frequency, percentage).

Table 3

Summary of Interview Transcripts About Parents' Perceptions of Youth Sport and Physical Education

Youth sport	Physical education
1. Health promotion in youth sport	1. Social development through PE • Participating in cooperative activities such as team sports
2. Learning life skills in youth sport • Working together with peers (teamwork) • Self-discipline such as patience	2. Playing time rather than learning time
3. Family relationship • Chance to interact with their children	3. Understanding the nature of PE depending on the grade level • A variety of activities and playing with peers in elementary level • Health education and fitness test in secondary level
4. Their children learn more in youth sport than PE • Deeper understanding in one sport in youth sport • Their children's choice of sports • Parental involvement	

Discussion

Lareau (2003) found that middle-class parents strongly believed that children learn crucial life lessons from sport, and they have repeated opportunities to practices those lessons in organized sport activities. Likewise, in this study, parents agreed that sport in both physical activity settings is a valuable source for children to develop socially through life lessons. They strongly believed that learning social skills and gaining knowledge of subjects were the most important and meaningful experiences in school for their children. Thus, PE and youth sport to them were great opportunities for their children to learn social skills. Although parents struggled to explain the process of how their children learned life skills in PE, they believed their children learned those skills in PE and youth sport. Based on this finding, the author suggests that physical educators consider how parents are addressing social development.

In this study, parents believed that their children learned more from youth sport than PE. Also, the biggest difference between the physical activity settings was parents' level of involvement in their children's experiences. Côté and Hay (2002) presented that family environment is a big influence on whether children become involved and decide to remain in sports and physical activity. In this study, the level of parental influence was higher in youth sport than in PE, mostly due to parents' time commitment, one of tangible parental support (Côté & Hay, 2002). Lareau (2003) documented that middle-class parents took for granted their obligation to develop their children's talents through participating in organized activities such as youth sports. As in previous research (Côté, 1999), parents in this study were heavily involved in spectating and transporting their children to practices and games. This time commitment was important. First, the family had a chance to construct companionship by spending time together. Companionship is a parental support wherein parents are involved in activities such as attending sporting events with their children (Côté & Hay, 2002). Lareau found that "the greater the number of activities middle-class children are involved in, the fewer opportunities they have for face-to-face interaction with members of their own family" (p. 39). On the contrary in this study, through participating in a youth sport program, family members were able to interact with each other. Playing video games or watching television was the most dominant leisure activities of children. Parents seemed to take for granted that their children play upstairs while they are downstairs. Separation during their leisure

time was typical of families in this study. In this reality, youth sport experiences were an opportunity for family members to bond because they spent time together and talked with each other.

Second, spectating children's practices and games was important for parents to understand their children's learning. Parents recognized learning in PE mainly from students' grades. Sometimes, children talked with parents about special experiences they had in PE. In contrast, parents observed the routine of practices and games and directly saw children's learning such as improvement of psychomotor and social skills. The most important benefit of direct observation is that parents were able to initiate conversation and provide their children with more concrete feedback; that is, they were able to provide emotional and informational support. Many researchers have revealed that these parents' psychosocial supports are an essential factor for children to develop self-esteem, competence, achievement, enjoyment, and enthusiasm (Power & Woolger, 1994; VanYperen, 1995; Woolger & Power, 1993). In addition, parents influence children in their level of enjoyment and self-competence because parental feedback is an important source of competence information (Hein, 2003). Thus, watching was not merely watching but a starting and key point for parental support. A parent who is not involved influences children in their learning in PE. Therefore, PE teachers need to make an effort to increase parental involvement. For example, teachers may arrange their gym in a way that invites parents in (Pawlas, 1999). Furthermore, inviting as an instructor as well as a spectator provides a memorable experience for families (Na, 2009).

Too high or low parental expectations may result in less enthusiasm from children who participate in youth sport (Côté & Hay, 2002). Hellstedt (1987) used a parental involvement continuum from *underinvolved* to *moderate* to *overinvolved* to describe the amount of involvement that parents have in their children's sport activities. Children benefit from moderate levels of parental involvement, that is, emotional and informational support, through increased enjoyment and competence, whereas students may not learn if their parents are excessively involved. Overinvolved parents are characterized by excessive attendance at practice sessions, standing next to the coach, and yelling (Hellstedt, 1987). A father showed those characteristics of overinvolvement in a low level:

> I try not to coach. And both Drew and Jon have come asked me not to speak up. And I try. So I think Mary, my wife,

> probably catches that because I just talk about what I wished had had happened differently or… some particular things that I might have observed that I would have liked to have been different. But I am trying not to coach from the stands or from the sidelines. (Drew's father interview transcript)

This finding of parents' overinvolvement is a rationale for parent education in youth sport programs. Recently, media have been focused on parents' violence coming from overinvolvement in youth sport settings. Regardless of violence, however, parents should recognize that positive experiences in physical activity settings are not necessarily individual processes, but may be collaborative processes. Parents should be educated about how they influence their children through their their behaviors and affect the quality of their children's experiences in physical activity settings.

Conclusion

Although the main finding of this study was that youth sport was a more valuable learning environment than PE from parents' perspectives, the intent was neither to distinguish superiority of one nor to be critical of the other. Rather, the author believes that by understanding the strengths and weaknesses in each setting from a comparative viewpoint, physical educators can improve their teaching or coaching methods. In addition, the purpose of this qualitative study was not to generalize findings to other PE and youth sport. Rather, based on a phenomenological perspective, the assumption is that an event that one parent experiences may happen to another (Van Manen, 1990). Thus, the findings in this study could be useful for physical educators situated in the similar contexts in PE and youth sport. Youth sport administrators and coaches need to recognize that parents believe that a youth sport program is an important learning context for promoting physical, social, and emotional development. For PE teachers, the findings in this study are an opportunity to reflect on their practice because parents could not answer or were unsure about what their children were learning in PE classes. Although this does not mean that learning does not occur, it is a message to physical educators that the intended curriculum may not be what is being communicated to students. Finally, teachers, coaches, and students may have similar or different perspectives on PE and youth sport. Therefore, research including all of them in the same context, such as a case study, will be useful for a true understanding of PE and youth sport.

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SCHOLARLY JOURNALS

Influential Kinesiology Journals: The View From Outside the Field

Duane Knudson

Abstract

The purpose of this study was to document the top journals classified in the area of kinesiology in three bibliometric databases and the associations between the main bibliometric indicators reported through them. The Thomson Reuters Journal Citation Reports was searched for journals indexed (n = 85) in the sport sciences *category for 2011. SCImago Journal and Country Rank was searched for journals indexed in the* physical therapy, sport therapy, and rehabilitation *(n = 70) and the* orthopedics and sports medicine *(n=146) subject categories for 2011. Google Scholar Metrics was searched for the top 20 journals in the* physical education and sports medicine *subcategory. SCImago journal rank, percentage of uncited papers, impact factor, and Hirsch index (h-index) were analyzed for the top 40 kinesiology journals. The mean bibliometric variables for the top quartile kinesiology journals were qualitatively similar to related academic disciplines. Moderate associations between journal rank, impact factor, and h-index in the databases were observed; however, only weak inverse associations were found between percentage of uncited papers and journal rank and impact factor. External bibliometric indicators showed relatively consistent ratings of influence of top kinesiology journals, but the core kinesiology journals and their influence within the field still need to be defined.*

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Kinesiology is the metadiscipline that is focused on the study of human movement or physical activity. Scholars interested in human physical activity have many journals in which to publish their research, within and outside the discipline of kinesiology. Within kinesiology, scholars have several multidisciplinary journals (e.g., *Medicine & Science in Sports & Exercise*, *Journal of Sports Sciences*, *The Physical Educator*, *Research Quarterly for Exercise in Sport*) in which to publish their research. They also have numerous subdisciplinary (e.g., biomechanics, exercise physiology, measurement, motor behavior, psychology) journals in which they may publish their kinesiology research.

Some faculty believe the influence of kinesiology journals is generally agreed upon, but limited bibliometric research has been done on kinesiology or its subdisciplinary journals. Miranda and Mongeau (1991) reported a survey of faculty perceptions of core physical education and sports journals. Researchers studying the subdiscipline of biomechanics have reported patterns of authorship and sampling (Knudson, 2011, 2012) and the perception of influential journals and articles (Knudson, 2007; Knudson & Chow, 2008; Knudson & Ostarello, 2008, 2010). Fifteen-year trends in social science research in sports (Gao, 2013) and 7-year trends in the impact factor of sports sciences journals have been reported (Tsigilis, Grouios, Tsorbatzoudis, & Koidou, 2010).

Given the lack of research on influential journals by kinesiology faculty beyond the subdiscipline of biomechanics, it is important for kinesiology faculty to know the external status of kinesiology journals based on bibliometric variables and databases commonly examined by the scientific community. The following databases are dominant in the bibliometric and journal influence field (Delgado-Lopez-Cozar & Cabezas-Clavio, 2013): the Thomson Reuters Journal Citation Reports, the SCImago Journal and Country Rank using Elsevier's Scopus, and Google Scholar databases. Many bibliometric variables from these databases have been used to evaluate the importance or influence of scientific journals. Several researchers have reported on the use and misuse of bibliometric variables as surrogate measures for evaluating the quality of journals, individual research studies, lines of research, departments, and whole institutions (Cameron, 2005; Frank, 2003; Garfield, 2006; Kurmis, 2003; Seglen, 1997). Therefore, faculty need to know the perceived influence of kinesiology journals in which they intend to publish their research.

The purpose of this study was to document the importance or influence of kinesiology journals in three bibliometric databases and the associations among four bibliometric variables reported in them. These descriptive data are important to kinesiology faculty seeking high-influence publication outlets and to understand the general perception of kinesiology journals in the academic community.

Methods

Journals related to kinesiology were accessed through the most relevant subject/disciplinary areas, headings, or categories in the three most common bibliometric databases. The Thomson Reuters Journal Citation Reports was searched for journals indexed (n = 85) in the *sport sciences* category for 2011. SCImago Journal and Country Rank was searched for journals indexed in the *physical therapy, sport therapy, and rehabilitation* (n = 70) and the *orthopedics and sports medicine* (n = 146) subject categories for 2011. Ten journals overlapped in these two categories, so 206 journals were related to kinesiology in the SCImago databases. Google Scholar Metrics was searched for English language journals in the *physical education and sports medicine* subcategory. Only the top 20 journals in each category are reported in Google Scholar Metrics, and the data used in the study were accessed May 7, 2013. Other subject areas and subdisciplinary categories were accessed in all databases to provide qualitative comparisons for kinesiology journal bibliometric data.

A primary bibliometric variable based on citation analysis was extracted from each database: the Journal Citation Reports 2-year impact factor (IF2), 3-year SCImago Journal Rank (SJR3), and the Google Scholar Metrics 5-year Hirsch index (h5). The IF2 is the average number of citations of the articles published in a journal in the subsequent 2 years. The SJR3 uses the PageRank algorithm to weigh the impact of citing journals in establishing an average impact for articles published in a journal. The Hirsch index (h5) is the number of articles published in the journal (N) that have at least N citations in the next 5 years. It has been shown through factor analyses that journal influence is associated with the prestige and impact constructs (Bollen, Van de Sompel, Hagberg, & Chute, 2009; Leydesdorff, 2009). In this study, IF2 and SJR3 indicate impact and h5 indicate the prestige factor.

An additional measure, the mean percentage of journal articles that were uncited from 2001 to 2011 (% uncited) in SCImago indexed journals (n = 19,708) was extracted to examine the representative nature of the three citation metrics on articles published in

kinesiology journals. Uncitedness is the percentage of papers that are not cited over a specified time, and most papers are infrequently cited, and thus, evidence of contribution to the literature is limited (Stern, 1990). The association of journal influence and uncitedness in published papers has been of recent interest (Egghe, 2013; Hsu & Huang, 2012). In 2011, 10,677 journals were indexed in the the Journal Citation Reports, and an estimated 40,000 publications were indexed in Google Scholar (Delgado-Lopez-Cozar & Cabezas-Clavio, 2013).

Bibliometric data were organized by the two kinesiology-related subject categories in SCImago (n = 206). The kinesiology journals list was reduced to 172, after 29 primarily medical/surgical journals were removed (e.g., *Journal of Bone and Joint Surgery*, *Arthroscopy*, *Seminars in Arthritis and Rheumatism*). Data for the top 40 journals (top 23%) were extracted from Journal Citation Reports and Google Scholar Metrics. Descriptive data were calculated, and correlations were calculated with 95% confidence intervals (Hopkins, 2007) to examine the associations among the bibliometric variables.

Results

Descriptive data for the top 40 kinesiology journals are shown in Table 1. These kinesiology journals had a mean (*SD*) SJR3 of 0.96 (0.41). Mean IF5 for top kinesiology journals was 2.16 (1.04). Seventeen of the top 20 journals in Google Scholar Metrics in *physical education and sports medicine* were also in the SCImago top 40, and these journals had a mean h5 index of 44.3 (10.2). Significant and moderate to large positive ($0.67 < r < 0.85$) associations were found among the three bibliometric variables (Table 2).

The mean percentage of uncited articles in top kinesiology journals in the previous 10 years varied from 12.8% to 80.7%. Significant but moderate ($r = -0.56$ to -0.50) inverse associations were found between the mean percentages of uncited papers with SJR3 and IF2. No significant association was found between % uncited and the h5 index from Google Scholar Metrics.

Table 1
Bibliometrics of Kinesiology Journals in Three Major Databases

	SCImago		Journal Citation Reports	Google Scholar
Journal	**SJR3**	**% Uncited**	**IF2**	**h5**
Sports Med	2.15	12.8	5.2	51
Am J Sports Med	2.11	23.9	3.8	68
Int J Beh Nut Phy Act	2.00	22.0	3.8	42
Med Sci Sports Exerc	1.75	21.1	4.4	63
Phys Therapy	1.28	43.6	3.1	48
Br J Sports Med	1.22	43.4	4.1	54
J Orth Sport Phys Th	1.20	43.6	3.0	35
Socio Sport J	1.15	46.7	0.9	–
Knee Sur Sp Tra Arth	1.22	38.1	2.2	42
Gait & Posture	1.10	22.9	2.1	–
J Biomech	1.09	23.1	2.4	44
J Sport Ex Psych	1.06	29.6	2.7	–
J Sci Med Sport	1.06	44.8	3.0	35
Clin Biomech	0.98	27.6	2.1	38
J Athletic Train	0.98	38.5	1.8	38
J Stren Cond Res	0.95	38.5	1.8	43
J Phys Act Health	0.95	37.2	–	–
Int J Sp Physio Per	0.92	61.3	1.8	–
J Sports Sci	0.91	38.6	1.9	39
J Electromyo Kine	0.89	24.8	2.0	–
Scan J Med Sci Sp	0.87	27.1	–	39
Int J Sports Med	0.85	32.7	2.4	34
J App Sport Psych	0.83	35.9	1.5	–
Psych Sport Exerc	0.81	28.5	1.9	34
Sport Psychologist	0.76	42.6	1.0	–
Clin J Sport Med	0.76	50.2	1.6	–
Clin Sports Med	0.74	47.2	1.6	–
Sport Ed Society	0.70	49.0	0.8	–
J Mot Behav	0.69	33.4	1.6	–
J Teach Phys Ed	0.68	50.7	1.0	–
Ad Phys Act Quart	0.65	46.7	1.5	–
Res Quart Ex Sport	0.64	41.1	1.5	–
Eur J Phys Reh Med	0.59	32.4	1.4	–
J Physiotherapy	0.59	61.5	1.9	–
Phys Therapy Sport	0.58	60.1	1.0	–
Ped Exerc Sci	0.58	48.2	1.7	–
Am J Phys Med Reh	0.57	40.1	–	–
Hum Mov Sci	0.56	32.8	1.8	–

Table 1 (cont.)

Journal	SCImago		Journal Citation Reports	Google Scholar
	SJR3	% Uncited	IF2	h5
Cur Rev Mus Med	0.55	80.7	–	–
Physiotherapy	0.53	57.6	1.6	–
M	**0.96**	**40.5**	**2.2**	**43.9**
SD	**0.41**	**13.3**	**1.0**	**10.0**

Note. Journals are ranked in SCImago Journal Rank (SJR3) and % uncited is the mean percentage of articles in that journal that were uncited in the Elsevier Scopus database over the last 10 years. IF2 is the 2-year impact factor for the journal from the Thompson Reuter Journal Citation Reports for 2011, and h5 is the Hirsch index for the journal over the last 5 years as reported in Google Scholar Metrics on May, 7, 2013. Missing data (–) are due to the journal not being indexed or having incomplete data for calculation of the metric for that database.

Table 2
Correlation Matrix for Associations Between Bibliometric Measures of Kinesiology Journals

Bibliometric variable	% Uncited	IF2	h5
SJR3	−.56 [−.74, −.30]***	0.85 [.72, .92]***	0.73 [.38, .90]***
% Uncited		−0.50 [−.71, −.20]**	−0.11[−.56, .39]
IF2			0.67 [.28, .87]*

Note. SJR3 is the 3-year SCImago Journal Rank, IF2 is the 2-year impact factor from Journal Citation Reports, and h5 is the 5-year Hirsch index from Google Scholar.
*$p < 0.02$. **$p < 0.01$. ***$p < 0.001$.

Discussion

The top 40 journals indexed in the three databases and classified as related to the kinesiology field had bibliometric measures that compared favorably to similar disciplinary areas. SJR3 for the top 40 kinesiology journals ranged from 2.15 to 0.53, and the SJR3 for "health professions" journals ($n = 202$) indexed in SCImago ranged from 2.52 to 0. The IF2 value for 36 of the top 40 journals in SCI-

mago ranged from 5.2 to 0.8. The mean IF2 (2.16 ± 1.04) for the top kinesiology journals was nominally similar to the mean IF2 in the categories of *rehabilitation* (2.02, $n = 142$) and *education, scientific disciplines* (2.39, $n = 80$). In Google Scholar Metrics, only the top 20 journals are reported according to h5, and the h5 index for 17 kinesiology journals over the past 10 years ranged between 68 and 34. For example, *Medicine & Science in Sports & Exercise* has 63 articles that have also been cited in the database at least 63 times over the previous 5 years. The mean h5 index (43.9 ± 10.0) of top-ranked kinesiology journals was nominally lower than the mean h5 for *social sciences* (60) or *health and medical sciences* (174).

The top quartile kinesiology journals appear to be well cited, and the bibliometric measures for each are favorable in the three major databases studied. However, the journals and publications indexed in the three databases, as well as the mix of journals classified as similar to the discipline of kinesiology, are varied. Despite these differences, the shared variance (r^2 between 45% and 72%) by the three bibliometric variables in the present study were similar for the top journals aligned with kinesiology. This was in agreement with researchers who reported strong associations ($r = 0.61$ to 0.93) among these bibliometric variables across the three databases in other disciplines (Delgado-Lopez-Cozar & Cabezas-Clavio, 2013; Elkins, Maher, Herbert, Moseley, & Sherrington, 2010; Sicilia, Sanchez-Alonso, & Garcia-Barriocanal, 2011).

The large variation in the % uncited papers in the top kinesiology journals was consistent with large differences in uncitedness across disciplines (Hamilton, 1991) A moderate (r^2 about 25%) inverse association was found between uncitedness and journal rank. There were fewer uncited papers in the most highly ranked journals by SRJ3 and IF2, and higher rates of uncited papers in lower ranked journals. There were several notable exceptions, and given the mathematical analysis of citations has an influence on the rankings, this association is logical. With the mean percentage of uncited papers over 10 years in top kinesiology journals being about 40%, it is clear that many articles in these journals do not substantially contribute to knowledge in the field. This observation of many papers in scholarly journals not being cited is common and, with other factors, is supportive of the recommendations of not using journal bibliometric variables as proxies for article quality (Brumback, 2012; Garfield, 2006; Seglen, 1997).

Differences in bibliometric measures and ranking across databases could be due to differences in databases in disciplinary clas-

sifications, indexing or coverage of journals, bibliometric controls, bibliometric variables, time windows, data accuracy and correction controls, and search features. For example, citations in the Journal Citation Reports IF2 are weighted equally, and citations in the SJR3 are weighted with the PageRank algorithm, with a larger time window. Databases are also different. For instance, SCImago and Journal Citation Reports are archived every year. However, Google Scholar is continuously updated, and only summary data of the most recent citation analyses are provided.

Lower numbers of papers are published each year in kinesiology journals compared journals in other disciplines, meaning SJR3 and impact factors may be more relevant bibliometric variables than h5. Although Hirsch indexes are highly stable, they are also highly correlated with the overall number of papers published and cited (Costas & Bordons, 2007). This could be the reason that h5 was not significantly correlated with the other two bibliometric variables in the top kinesiology journals.

Since journal influence is a multidimensional phenomenon (Coleman, 2007; West & Rich, 2012), it would be desirable for future researchers to extend these results with scholar ratings of the influence kinesiology journals. Researchers in other fields have used several methods to identify core disciplinary journals (DuBois & Reeb, 2000; Furr, 1995; Goodyear et al., 2009; Sellers, Perry, Mathiesen, & Smith, 2004). Research on professional's perceptions of core kinesiology journals would help kinesiology scholars better define the field to other scholars and journal databases. This would be important information to assist junior faculty members in defending publication in the most relevant kinesiology journals and challenge potential abuse of bibliometric measures. Bibliometric measures alone are not adequate to document the influence of multidisciplinary or subdisciplinary journals in kinesiology.

Limitations of the present study include subjectivity in the journals indexed and classified as aligned with kinesiology by each database, as well as subjectivity in the authors' exclusion of highly ranked journals classified as primarily medical rather than related to the field of kinesiology. Despite these limitations and other subtle differences between the databases (see Delgado-Lopez-Cozar & Cabezas-Clavio, 2013), the following conclusions seem warranted. The bibliometric indices in the 40 highest rated kinesiology journals by the three most commonly used databases were qualitatively similar or slightly lower than other related scientific disciplines in

education and allied health. Despite variations in how bibliometirc variables are calculated and what journals are indexed, moderate associations were found between SJR and IF2 in top kinesiology journals.

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TEST AND MEASUREMENT

Addressing Educational Reform: Exploring PE Metrics as a System to Measure Student Achievement in Physical Education

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Abstract

The current educational reform movement in the United States is focused on measuring the effectiveness of teachers. One component of teacher effectiveness is student achievement. The effectiveness of using PE Metrics as a measure of student achievement in a physical activity setting with a low socioeconomic, culturally diverse population was examined in this study. Two raters scored second and fifth grade children (N = 90) on skills using the PE Metrics system. Skills assessed included skipping, galloping, dribble with hand jog, basketball, soccer, and overhand throw. An item analysis showed that teachers could use the majority of the items to discriminate skill level. Strengths and weaknesses of the PE Metrics system were discussed.

The lack of student achievement as measured by standardized tests has resulted in a renewed interest on the practices teachers employ to promote student learning. For more than two decades,

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educational reform has been a topic of interest on a national level. Policy makers have implemented many systems to assess what students are learning, the most publicized model being No Child Left Behind (NCLB, 2002). An important finding from these systems of assessment is that "teachers are the fulcrum that determines whether any school initiative tips towards success or failure" (Darling-Hammond, 2009, p. 1). The best school predictor of student outcomes is teaching that is informed by high-quality practices, effective delivery of information, and quality systems to assess student achievement (Goldhaber, 2002; Wright, Horn, & Sanders, 1997). Researchers have supported this notion in recent years, such as Clotfelter, Ladd, and Vigdor (2007), who found quality teachers had a greater impact on achievement gains of students than parents and race combined.

Although systems are in place to observe teacher performance and student achievement, most school district and state government officials cannot pinpoint what differentiates a high-quality teacher from a low-quality teacher. This is due to an inefficient and unreliable methodology of how teacher assessment is conducted. For example, in the 2009 New Teacher Project study titled *The Widget Effect*, Weisberg, Sexton, Mulher, and Keeling found that the outcome of most evaluation systems is either satisfactory or unsatisfactory. Having only two final outcomes for an assessment is troubling, but what is more concerning is that 99% of teachers that are assessed with such systems earn a *satisfactory* rating. Weisberg et al. also suggested that when these teacher evaluation systems are linked to student achievement, they are only linked to standardized test scores, which sheds little light on theories and practices employed to measure teacher effectiveness. Even if these teacher evaluation models were valid, reliable, and fair, they still may not be used to assess teacher performance in unique settings such as physical education (PE), art, and music. Reform will need to include all teachers in all subject areas in the educational system for fairness. Therefore, this is an indication to begin the process of developing an assessment system to measure teacher effectiveness at all levels in PE. Measuring teacher effectiveness includes observation of teacher performance and documentation of student achievement. However, developing a system to measure student achievement is an important step in developing a system of teacher effectiveness in PE environments.

National Association of Sport and Physical Education

In 1983, the National Commission on Excellence in Education published a report titled *A Nation at Risk*, claiming the United States was becoming "academically obsolete" compared to other nations. The result was a nationwide effort to develop a system of standards that could be implemented to measure knowledge acquisition of school-aged students in specific academic subjects. The National Association for Sport and Physical Education (NASPE, 1995) responded to this call for reform by developing the first national content standards for PE. The framework for these standards is based on skill acquisition, knowledge development, and affective elements students would need to exhibit to stay physically active for a lifetime (see Table 1). However, although it has been suggested following these standards will lead to high-quality PE (Lambert, 2007), the numerous barriers of limited time allocation, low subject status, and inadequate resources have limited the application of standards to many PE settings (McKenzie & Lounsbery, 2009).

Table 1
National Standards for Physical Education

Standard 1: Demonstrates competency in motor skills and movement patterns needed to perform a variety of physical activities.
Standard 2: Demonstrates understanding of movement concepts, priniciples, strategies and tactics as they apply to the learning and performance of physical activities.
Standard 3: Participates regularly in physical activity.
Standard 4: Achieves and maintains a health-enhancing level of physical fitness.
Standard 5: Exhibits responsible personal and social behavior that respects self and others in physical activity settings.
Standard 6: Values physical activity for health, enjoyment, challenge, self-expression, and/or social interaction.

Note. From *Moving Into the Future: National Standards for Physical Education* (2nd ed.), by National Association for Sport and Physical Education, 1995, Reston, VA: Author.

Although content standards for PE have been developed in all 50 states, NASPE standards have not been fully adopted on a national level. Regardless of the challenges NASPE officials have faced implementing the content standards on a systematic level, they have moved forward with a system to measure student achievement as informed through the NASPE PE content standards.

Student Achievement in Physical Education

Students have traditionally been graded in PE on aspects other than ability (Johnson, 2008). For example, many assessment plans include awarding points for attendance, participation, and dressing appropriately. When teachers grade on elements other than motor ability, it is communicated to students that only showing up for class, displaying appropriate behavior, and the appearance of effort are needed to pass PE (Melagrano, 2007). In the current evidence-based educational environment, there is a need for documentation of student achievement on mastering content standards and less emphasis on managerial tasks such as attendance. Documentation of student achievement needs to be grounded in evidence of learning within the realms of cognitive, psychomotor, and affective domains. Therefore, such managerial tasks must be replaced by more legitimate factors for grade calculation if student achievement is to be measured on true learning objectives (Stiggins, 2001).

Most PE programs currently do not have an assessment system that results in valid and reliable scores with which to measure student achievement across a district or state. Therefore, district officials and teachers lack empirical data to measure the effectiveness of instruction. Thus, assessment measures that align with a national set of content standards will be needed to prove student learning occurs in PE environments.

PE Metrics

In 2000, a standards-based assessment of cognitive and psychomotor skills was developed by NASPE (2001) as an effective tool to measure change or growth in students' abilities in PE settings. This system of assessment was intended to be used to measure student achievement as based on the NASPE PE standards. The result was a published series of assessments called PE Metrics. Through a system of assessments, PE Metrics is used to measure competency in motor skill and movement patterns, understanding of movement concepts, understanding of characteristics of a physically active lifestyle, and knowledge of social responsibility as it relates to physical activity (NASPE, 2012). Fissette and Franck (2013) highlighted PE Metrics as a system that may be used to develop formative assessments to determine student growth. The use of PE Metrics as the primary assessment system in PE would result in pre- and postmodels of assessment, which teacher will be able to use to measure student achievement.

Although NASPE standards may be measured with PE Metrics, competence in psychomotor skills and movement patterns, as described in Standard 1, is the focal point of the assessment series. Standards 2 to 6 are focused on the cognitive domain, and students are tested through multiple-choice test questions. The assessment developers have provided empirical support for the reliability and validity of the scores from PE Metrics (Dyson et al., 2011; Fox et al., 2011; Zhu, Fox, et al., 2011; Zhu, Rink, et al., 2011). However, a replication of these results within different populations has yet to be published.

Although PE Metrics may be used to measure teacher quality and student achievement (NASPE, 2012), further research on PE Metrics must be conducted before this system can be confidently used as one part of measuring the effectiveness of teachers. One reason for this further research is the changing cultural climate in the United States. It is predicted the United States will be a predominantly majority-minority country by the year 2043 (U.S. Census Bureau, 2012). Because race and ethnicity are often determinants of a person's socioeconomic status, minorities often reside in low socioeconomic areas (House & Williams, 2000). Therefore, it is important to assess whether a system that measures student achievement will perform well with a low socioeconomic, culturally diverse population. PE Metrics has been validated by the developers in an area that lacks the predicted diversity of the United States. Therefore, there is a need to examine this instrument in settings with diverse populations. Although the long-term goal of this project is to investigate effective teaching practices in PE using student achievement and teacher observational tools, the first step is to investigate a standardized method of measuring student achievement. To this end, the purpose of this study was to (a) test the effectiveness of using PE Metrics with a low socioeconomic, culturally diverse population and (b) examine the test sensitivity of assessments for teachers to be able to discriminate among students with varying levels of abilities.

Method

Participants

Participants were 60 fifth (M = 9.9 years, SD = .52) and 30 second (M = 6.5 years, SD = .50) graders enrolled in a physical activity camp at a southwestern university. One enrollment requirement for the summer camp was that the campers had to come from

families with incomes near or below the poverty line, and therefore, all participants could be classified as coming from low socioeconomic status. Ethnically, the fifth grade participants self-reported being Hispanic or Latino (74%), Caucasian (10%), Native American (9%), African American (4%), and not identified (3%). The second grade participants reported being Hispanic or Latino (78%), Caucasian (13%), Native American (11%), African American (2%), and not identified (6%). This sample is the population in which further studies of teacher effectiveness would occur.

Procedure

During the gymnasium sports activity time of each camp, participants individually performed the targeted skills. Two raters watched the skill and scored participants on the corresponding PE Metrics rubric. Data collection occurred over several days after minimal amounts of training between the raters. All participants performed one skill before rating began on the next skill. Raters were former K–12 teachers with experience in PE and elementary settings. Interrater reliability for second grade skipping, galloping, and basketball dribbling was $r = .85$, $r = .82$, and $r = .96$, respectively. Interrater reliability for fifth grade basketball dribbling, soccer dribbling, and overhand throw was $r = .93$, $r = .96$, and $r = .94$, respectively.

Analysis

To determine the test sensitivity and effectiveness of using PE Metrics with a low socioeconomic, culturally diverse population, an item analysis was conducted on three motor skills within second (skipping, galloping, and dribbling with hand and ball) and fifth (basketball dribbling, soccer dribbling, and overhand throw) grade assessments. Test sensitivity is whether teachers can use a scale to discriminate among individuals with varying levels of abilities. Sensitivity of scale items of a given assessment was documented to deviate across populations (Ferketich, 1991), creating the need for assessments to be tested within and across many populations.

Results

Grade 2

The results of item analysis are provided in Table 2. Of specific interest to the current project was the item discrimination index and difficulty measure. The discrimination index, a measure of item sensitivity, is the tool teachers used to differentiate between students

who could efficiently demonstrate the assessed motor skill and students who had not developed or learned the motor skill. Results of the motor skills of 6- and 7-year-olds indicated that teachers cannot use the rubric for skipping to differentiate between ability levels with both of the skills within the rubric (form and consistency), resulting in a discrimination index of 0 and an item difficulty of 1, indicating that 100% of students within this population were able to competently complete this skill. The results of the motor skill of galloping, with a discrimination index of 0.26 and a difficulty measure of 0.86, indicated that teachers can use the rubric to discriminate between levels. This difficulty measure indicates that 86% of the students were able to meet the criteria for competence for galloping. Sufficient test sensitivity was revealed for the motor skill of dribbling with hand and ball, with results indicating a discrimination index of 0.73, 0.81, and 0.73 for the skills of form, spacing, and ball control, respectively. Difficulty measures of 40%, 30%, and 43% indicated students had competent form, competent spacing, and competent ball control, respectively.

Table 2
Results of Grade 2 Data

Item	*N*	*M*	*SD*	Discrimination index	Difficulty measure
Skipping					
Form	30	3.93	0.25	0	1.00
Consistency	30	3.86	0.34	0	1.00
Galloping					
Form	30	3.53	0.73	0.26	0.86
Consistency	30	3.70	0.59	0	0.93
Dribbling with hand jog					
Form	30	2.30	0.91	0.73	0.40
Spacing	30	2.26	1.01	0.81	0.30
Ball control	30	2.36	0.88	0.73	0.43

Grade 5

Results for Grade 5 are presented in Table 3. Grade 5 rubrics were more efficient for differentiating between students who could competently complete the motor skill and student who could not. However, some of the differentiation or variance between students' skill levels may be due to gender rather than skill ability. Interesting

patterns emerged when the results of the motor skills assessed were separated by gender. Overall, the motor skill of basketball had a discrimination index of 0.50, 0.66, and 0.75 for dribbling, passing, and receiving, respectively, with 75% of students being able to competently dribble, 65% being able to pass, and 72% being able to competently receive the basketball. When the results were separated by gender, 93% of males and only 64% of females were competent in dribbling. For the skills of passing and receiving, 90% of males and 48% of females were competent in passing and 90% of males and 53% of females competent in receiving. Results separated by gender are provided in Table 4. At the aggregated level, soccer motor skills on the whole, particularly foot motor skills, were more difficult for students, with results indicating only 54% of students being able to dribble a soccer ball competently, 35% able to pass, and 52% able to receive. The teachers could discriminate between those who were competent and those who could not complete the skill, with an index of 0.33 for dribbling a soccer ball, 0.33 for passing, and 0.50 for receiving. When results were separated by gender, males in general were rated more frequently as being competent in the motor skill than females, with 60% of males and only 41% of females being competent in dribbling a soccer ball. For passing and receiving, 35% and 65% of males, respectively, were rated as competent, with only 28% and 37% of females competent, respectively. Last, the results from the overhand pass revealed discrimination indices of 0.75 for form and 0.33 for accuracy, with 48% of students having competent form and 59% being competent in accuracy. When results were examined by gender ratings, 67% of males were competent in their form and 80% were competent in their accuracy of overhand throwing. For females, only 31% were competent in their form and 39% competent in their accuracy of overhand throwing.

Table 3
Results of Grade 5 Data

Item	*N*	*M*	*SD*	Discrimination index	Difficulty measure
Basketball					
Dribble	47	2.95	0.75	0.50	0.75
Pass	47	2.78	0.77	0.66	0.65
Receive	47	2.87	0.76	0.75	0.72

Table 3 (cont.)

Item	*N*	*M*	*SD*	Discrimination index	Difficulty measure
Soccer					
Dribble	42	2.54	0.73	0.33	0.54
Pass	42	2.16	0.79	0.33	0.35
Receive	42	2.50	0.70	0.50	0.52
Overhand throw					
Form	37	2.51	0.98	0.75	0.48
Accuracy	37	2.56	0.92	0.33	0.59

Table 4
Results of Grade 5 Data Separated by Gender

	Male				Female			
Item	*N*	*M*	*SD*	Difficulty measure	*N*	*M*	*SD*	Difficulty measure
Basketball								
Dribble	28	3.28*	0.59	0.93	19	2.66	0.79	0.64
Pass	28	3.14*	0.59	0.90	19	2.33	0.79	0.48
Receive	28	3.32*	0.66	0.90	19	2.52	0.74	0.53
Soccer								
Dribble	20	2.65	0.58	0.60	22	2.18	0.90	0.41
Pass	20	2.40*	0.59	0.35	22	1.90	0.92	0.37
Receive	20	2.70*	0.57	0.65	22	2.27	0.76	0.37
Overhand throw								
Form	24	2.91*	0.77	0.67	13	2.00	1.00	0.31
Accuracy	24	3.08*	0.71	0.80	13	2.23	0.92	0.39

*Male means significantly higher than female means at the alpha .05 level.

Discussion

PE Metrics is a beginning to the development of a standardized system to measure student achievement across PE settings. However, the results of this study show strengths and weaknesses of the PE Metrics system. The greatest strength is that PE Metrics is the first steps toward an evidence-based system to assess students in PE.

This begins a much-needed discussion of how to standardize methods of assessment in PE to meet new educational reform guidelines.

Moreover, evidence from this study strengthens the argument that reliable scores result from PE Metrics. Dyson et al. (2011) in their research on the performance of PE Metrics with elementary-aged students found through an item analysis that 57% of participants established a mean score between 2.2 and 2.8. In comparison, the item analysis in this study indicated that 64% of participants achieved a mean score between 2.2 and 2.8. This finding is supportive of Dyson et al.'s conclusion that the assessments provided by PE Metrics accurately capture student growth.

This study also indicates that individuals who have minimal experience in assessing student growth in PE may use PE Metrics. In this study, the raters had under 10 hr of training and were able to use the rubrics to produce reliable scores in real time. Although the developers of PE Metrics recommend tape-recording students performing these skills and scoring at a later time, the rubrics may be clear and concise enough to score participants in real time. This indicates PE Metrics may be used in a classroom environment with or without a videotaping mechanism, suggesting PE Metrics could be used in PE programs with limited resources.

Furthermore, one of the raters was an expert in PE and the second rater was an elementary teacher with minimal experience in PE settings. That both raters were able to produce consistent scores indicates that PE teachers of different levels of expertise may use PE Metrics to measure student achievement accurately in PE environments. Thus, beginning and veteran teachers may use PE Metrics as a method to assess student performance regardless of level of experience or expertise.

Given the small-scale nature of this study, there may be possible concerns regarding the variance in scores. For example, the second grade sample had just finished first grade and most students tested had already mastered the skills at the second grade level (100% skipping, 86% galloping). At the fifth grade level, variance seems to have occurred due to gender, suggesting a possible bias in the rubrics. This variance in gender could be a result of male participants playing the game of basketball more frequently than females. More research is needed to determine whether there was a gender bias within the PE Metrics assessment or males from low socioeconomic, culturally diverse settings play basketball more often than females. However, if these assessments are to be used as a

standardized method to measure student achievement, enhanced test sensitivity or modifications for female and male participants based on previous sport experience are essential to document change from one administration to the next.

Conclusion

PE Metrics has proven to be a reliable system to measure student achievement in PE settings. However, if PE Metrics is to be the primary vehicle to measure student achievement with intent to provide evidence of PE teacher effectiveness, more studies of PE Metrics in low socioeconomic, culturally diverse environments are needed to ensure a valid, fair, and objective system of assessment. Further studies should also be produced that focus more specifically on whether the results of PE Metrics are different based on gender.

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