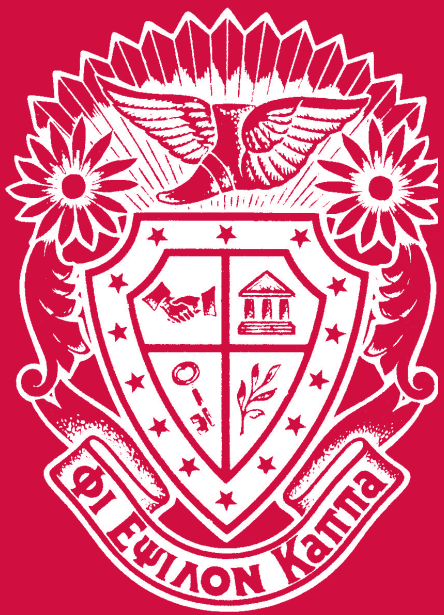
The Physical Educator



A PUBLICATION OF

Phi Epsilon Kappa Fraternity

The Physical Educator

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

(USPS 431-220)

of Phi Epsilon Kappa

THE OFFICIAL PUBLICATION OF

PHI EPSILON KAPPA FRATERNITY

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

Associate Editor
Tonya L. Sawyer, Ph.D.
NCAA Compliance Assistant Director
Department of Intercollegiate Athletics, Indiana State University
tonya.sawyer@indstate.edu

Phi Epsilon Kappa

THE PHYSICAL EDUCATOR (Print ISSN: 0031-8981, Ejournal ISSN: 2160-1682) is published five times a year in the spring, summer, fall, early winter, and late winter by Sagamore-Venture, 3611 N. Staley Rd., Ste. B, Champaign, IL 61822.

POSTMASTER: Send address changes to *The Physical Educator*, Sagamore-Venture, 3611 N. Staley Rd., Ste. B, Champaign, IL 61822.

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

Editorial Office

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

Subscription Office

Sagamore-Venture LLC
3611 N. Staley Rd., Ste. B
Champaign, IL 61822

The Physical Educator
(TPE) Volume #78
Print ISSN: 0031-8981 | Online ISSN: 2160-1682
Print and electronic archives | 6 issues annually

Individual/online	$260
Individual pkg	$290
Individual International/online	$260
Individual International/pkg	$330
Institution/online	$570
Institution/pkg	$660
Institution International/online	$570
Institution International/pkg	$685
Phi Epsilon Kappa Member online	$100

http://bit.ly/2Jn7fgk

Average number of copies printed per issue (net press run) during the preceding 12 months is 3010; number of copies nearest to filing date is 150. Average number of copies of each issue distributed in mass mailing to subscribers during the preceding 12 months is 1337; number of copies nearest to filing date is 137. Average number of copies of each issue distributed free during the preceding 12 months is 29; number of copies nearest to filing date is 4.

Send address correspondence concerning subscriptions and change of address to Membership/Subscription Department, *The Physical Educator*, Sagamore-Venture, 3611 N. Staley Rd., Ste. B, Champaign, IL 61822. Make check or money order payable to Sagamore-Venture, order online at www.sagamorepublishing.com, or call 800-327-5557.

THE PHYSICAL EDUCATOR
2021 | Volume 78 | Number 4

Articles

You and the Law

The Physical Educator Vol. 78 • pp. 343–357 • 2021
https://doi.org/10.18666/TPE-2021-V78-I4-10471

FITNESS

Effect of a Skating Unit on Fitness in Fifth-Grade Students

Eric J. Lange, Cathy D. Lirgg, Dean R. Gorman, Maryann Mitts

Abstract

This study investigated the effect of a skating unit on cardiovascular fitness, eyes-closed static balance, explosive power, and agility in fifth graders. During a 6-week skating unit (12 lessons), 71students (M_{age} = 10.34 years, range: 10–12 years) participated during regularly scheduled physical education classes. Three classes were involved, one serving as the control group and the other two as experimental groups (roller skating and in-line skating). The control group had no access to roller or in-line skates during class time, rather the curriculum consisted of soccer, dance, and softball. The experimental groups participated in a specifically designed skating curriculum adapted with permission from Skatetime and Skate in School. Results showed that the roller skating group had longer static balance times than the in-line skating group. Even though other factors reported nonsignificance, difference scores illustrated gains after intervention, suggesting that a skating unit could induce improvements. Further research examining significance between roller skating and in-line skating is warranted.

Eric J. Lange, Life Sciences Department, Tulsa Community College. Cathy D. Lirgg, Department of Health, Human Performance, and Recreation, University of Arkansas. Dean R. Gorman, Department of Health, Human Performance, and Recreation, University of Arkansas. Maryann Mitts, Department of Kinesiology, Missouri State University. Please send author correspondence to eric.lange@tulsacc.edu

Schwab and Dustin (2014) recommended that physical education teachers begin to look beyond the traditional classroom curriculum of activities such as football and soccer and consider implementing nontraditional activities into schools that have a positive impact on students' health and create lifelong behaviors into adulthood. Skating is one such nontraditional activity that physical education teachers can utilize to provide a fun means to achieve many health- and sport-related benefits.

Skating exists in several different forms, two of which are roller skating and in-line skating. Roller skating and in-line skating are stylish and fun forms of exercise suitable for all ages and experience levels (Gold, 2006). Roller skating and in-line skating are a means of transportation where participants use their physicality to propel themselves in a given direction on a platform of wheels. Throughout the years, skating has become more diverse by providing greater opportunities for individuals to participate in specialized activities such as hockey and aggressive, figure, and speed skating. Skating's diversity allows for the modification of traditional sports such as basketball and team handball, during which participants wear skates while participating, which adds another level of complexity and enjoyment (McManama, 2014; Skatetime, 2013a). The diversity of skating has led to many cities and municipalities investing in specially designed skate parks, boardwalks, paved trails, and skating rinks for skaters to skate in a safe environment free from the hazards of the road. However, most skaters enjoy the freedom of skating on neighborhood streets and sidewalks, which provide unique opportunities to perform tricks.

Skating is an aerobic activity and as such may lead to increased cardiovascular endurance along with the added benefits of enhanced balance, greater explosive power, and elevated motor ability demands. Prior research into the physiological changes in cardiovascular fitness found that in-line skating induced similar changes comparable to running in VO_2 max training volume and HR intensity (Melanson, Freedson, & Jungbluth, 1996; Melanson, Freedson, Webb, et al., 1996; Orepic et al., 2014; Wallick et al., 1995). Research has also suggested that skating (in-line and ice) can improve balance and explosive power in children (Keller et al., 2014; Muehlbauer et al., 2013) and postural control in older adults (Lamoth & Heuvelen,

2012). Finally, Rinne et al. (2007) found that the high level of motor ability demands from skating can improve a participants' "spatial orientation, kinesthetic differentiation, balance, reaction ability, and sense of rhythm" (p. 205).

The physiological benefits gained by those who participate in a skating unit illustrate the significance for schools and school districts to find the means to implement this type of activity into their curricula. In children, skating can reduce the onset of obesity and chronic diseases contributing to a healthier quality of life in adulthood. Regular participation in this activity can promote a healthy lifestyle to reduce the incidence of chronic debilitating illnesses such as heart disease, cancer, type 2 diabetes, and osteoporosis in adults (SHAPE America, 2016). Furthermore, such an activity meets the recommendations of the American Heart Association (AHA, 2015) that adults participate in 30 min of moderate aerobic activity 5 days weekly and children (AHA, 2016) receive a minimum of 60 min of moderate to vigorous aerobic activity daily. Menschik et al. (2008) found that adolescents who participated in "wheeled activities" such as in-line skating and roller skating were less likely to be overweight later in life, stressing the importance of skating's role on a person's health today and into the future.

Therefore, this study investigates the effect of a roller skating unit or an in-line skating unit on cardiovascular fitness, eyes-closed static balance, explosive power, and agility in fifth grade students. Specifically, do the PACER, static balance, vertical jump, and agility difference scores vary between students who participate in a unit in roller skating, those who participate in an in-line skating unit, and those who participate in a regular physical education class?

Method

Participants

Eighty-two fifth-grade students from an elementary school in the Southern United States participated in this study. Eleven students (13.4%) were removed from the analysis due to nonparticipation, incomplete data, or leaving the school. During their regularly scheduled physical education classes, three classes (n = 71) were divided into the control group (n = 19, 8 males, 11 females, M_{age} = 10.37 years) and two experimental groups of roller skating (n = 26,

11 males, 15 females, M_{age} = 10.31 years) and in-line skating (n = 26, 10 males, 16 females, M_{age} = 10.35 years). For the purposes of this study, students in the control group did not have access to the roller skates or in-line skates in physical education classes throughout the study.

Dependent Measures

Cardiovascular Fitness

The PACER (Léger & Lambert, 1982; Léger et al., 1988) was administered as a measure of cardiovascular fitness. Cone lines were set up 20 meters apart on the outdoor blacktop. The test began with participants lined up on one side of the course and when the audio track began, the subjects ran to the other side of the course. A beep indicated the pace at which the subject needed to reach the other end of course. As the music continued, the pace increased, and participants continued to run until they could no longer maintain the pace for two ends. The total number of ends was determined by subtracting the total number of ends run from the number of ends missed or not completed before the beep. The evaluator demonstrated the procedure but gave no other instruction to the participants.

Static Balance

The Modified Stork Standing Balance Test (Hammami et al., 2016) is a timed test measuring static balance. With shoes on, participants placed their hands on their hips and their nonsupporting foot against the inside of the supporting leg's knee. Holding that position, the participant closed their eyes and the evaluator started the time on a stopwatch. The test ended when any of the following occurred: the supporting foot's heel raised off the floor or the supporting foot moved/hopped in any direction, the participant's hand(s) came off the hips, eyes opened, or the nonsupporting foot moved from the supporting leg. The evaluator demonstrated the procedure but gave no other instructions to the participants. Participants had one practice attempt and two timed attempts with a short rest of approximately 2 min between each attempt. The longest attempt time was recorded to the nearest one hundredth of a second between the two attempts.

Explosive Power

Explosive power was measured with the vertical jump (Cheah et al., 2017; Leard et al., 2007). For this task, the evaluator first measured a standing reach. With shoes on, the participants stood in a natural position with their side against the wall and their dominant arm reaching overhead without overreaching. The highest reach point was recorded to the nearest half inch to establish the standing height (Chu, 1998). After the standing height was established, the jumping height was measured with a Vertec jumping apparatus. With their dominant side facing the apparatus, the participants stood under the apparatus with their feet shoulder width apart. The participants then performed a counter movement that allowed them to swing their arms down and back as they bent their knees. They then performed a jump and swung their arms up to touch the highest possible movable vane with their dominant hand (Wood, 2008). The evaluator demonstrated the procedure but gave no other instructions to the participants. The vertical jump was determined by the highest vane touched minus the standing reach and recorded to the nearest half inch. Participants were permitted one practice jump and two attempts with the best jump recorded to the nearest half inch.

Agility Run

The Illinois Agility Test (Dawes et al., 2012; Raya et al., 2013) measured participants' running agility. The length of the course was 10 m long with a width of 5 m. Four cones marked the perimeter of the box and designated the start, finish, and turning points of the test. In addition, four cones ran the length of the 10 m in the middle (5 m from the edge) of the box spaced 3.3 m apart. Taped arrows on the floor aided participants in performing the task. Participants assumed the start position by lying face down with head facing the start line and hands by their shoulders. The timer said "Go" and the stopwatch was started. They quickly rose from the floor and ran the course without knocking over any cones to the finish line, where time was stopped. The evaluator demonstrated the procedure but gave no other instructions to the participants. Participants performed two attempts with an approximate rest of 2 min between each attempt. The fastest time of the two attempts was recorded to the nearest one hundredth of a second.

Procedure

Before the start of the skating unit, students in the control and experimental groups performed a series of pretests measured over 2 days, which established a baseline. On Day 1, three tasks were measured: Standing Stork to measure balance, vertical jump to measure explosive power, and Illinois Agility Test to measure agility. On Day 2, the PACER test was administered as a measure of cardiovascular fitness. The class was divided into several groups that consisted of about five to seven participants to perform the task. Students had one attempt with the number of laps completed recorded for analysis.

During the 6-week (12-lesson) intervention, the control and experimental groups met twice weekly during their regularly scheduled 45-min physical education classes. This protocol required no change to their daily routine. During this time, the control group participated in their regularly scheduled curriculum that included the completion of a softball unit, dance unit, exercise stations, and the beginning of a soccer unit. The control group was not permitted to participate in any roller skating or in-line skating activities during class periods throughout the study. The experimental skating groups participated in a modified skating curriculum adapted and/or reprinted with permission from Skatetime (2013a, 2013b, 2017, 2018) and Skate in School (2016a, 2016b), which ensured commonality between the roller skating group and in-line skating group. Each daily lesson consisted of a warm-up, an activity of the day, and closure. All skating activities were held indoors throughout the study. During the intervention, the students in the in-line class had a scheduled school holiday that required the students to make up that day. The teacher and students agreed to make up the missed class time during the recess that followed the normally scheduled class time.

At the end of the intervention period, a series of posttests were performed to remeasure the students' fitness. The posttests were conducted by the assessment team and followed the 2-day protocol established during the pretesting. Students followed the same rotation of stations and evaluators managed the same stations established in the pretests, for consistency of data collection.

Treatment of Data

The Statistical Package for Social Sciences (SPSS) version 23 was utilized in the analysis of the descriptive statistics for this study. The dependent variable for this study was the difference in posttest minus pretest fitness testing scores. An ANOVA with three levels (control, roller skating, in-line skating) was conducted separately, evaluating difference scores for each of the factors: cardiovascular fitness, static balance, explosive power, and agility. Post hoc tests were conducted when appropriate. An alpha set at the .05 level defined the significance for all tests.

Prior to final analysis, three evaluations to determine the viability of the samples based on attendance, measurement error, and/or improper physical education attire during the pretest and posttest evaluations and to remove extreme outliers were performed on the samples. The teacher recorded daily attendance during the intervention period of this study. Participants who did not meet the 8 out of 11 lessons (72%) attendance had their data removed from final analysis. After a review of the attendance records, all ($n = 71$) students met the attendance requirement. The attendance rates by class were control 95.65%, roller skating experimental 96.5%, and in-line skating experimental 93%. Next, participants were removed from the analysis due to measurement error and/or improper physical education attire (i.e., boots) during testing periods. In total, nine Stork, five vertical jump, and three agility run data points were removed and treated as missing data. Finally, extreme outliers were identified and removed prior to final analysis. Jones (n.d.) defined an extreme outlier as a value that "lies more than 3.0 times the interquartile range [IQR] below the first quartile [Q1] or above the third quartile [Q3]" and is represented mathematically where the score (x) is "$x < Q1 - 3 * IQR$ or $x > Q3 + 3 * IQR$" (Extreme Outliers section, para. 1). In total, four participants (Illinois Agility, $n = 1$; Stork Standing, $n = 3$) were removed from the analyses.

Results

A one-way ANOVA, conducted on each dependent variable, resulted in significance for only the Stork balance, $F(2, 56) = 4.90$, $p = .011$. The difference scores between the posttest and pretest Standing Stork balance time, as assessed with eta-squared, showed strong association, accounting for 14.9% of the variance of the dependent variable.

Because Levene's test was nonsignificant, $F(2, 56) = 2.52$, $p = .090$, the variances were assumed to be homogeneous and post hoc comparisons were conducted with the Tukey-Kramer test. The group that participated in roller skating ($M = 3.57$) showed on average a greater increase in balance time compared to those participating in in-line skating ($M = -0.98$). No significant differences were found between the roller skating group ($M = 3.57$) and control group ($M = 0.29$), and the in-line skating group ($M = -0.98$) and control group ($M = 0.29$). Table 1 shows the 95% confidence intervals for the pairwise differences, as well as the difference scores and standard deviations for the three balance groups.

Table 1

95% Confidence Intervals of Pairwise Differences in Difference Scores and Standard Deviations for Modified Stork Standing Balance Test in seconds

Group	*n*	*M*	*SD*	Control	Roller skating
Control	17	0.29	3.38		
Roller skating	22	3.57	4.13	[-0.50, 7.05]	
In-line skating	20	-0.98	6.42	[-5.14, 2.59]	[-8.17, -0.93]*

Note. An asterisk indicates that the 95% confidence interval does not contain zero, and therefore, the difference in the means is significant at the .05 significance using Tukey-Kramer procedure.

Nonsignificance was reported at the .05 level for the PACER scores , $F(2, 67) = 1.49$, $p = .23$; vertical jump inches, $F(2, 63) = 1.34$, $p = .27$; and Illinois Agility time, $F(2, 63) = 1.60$, $p = .21$. Table 2 shows difference scores and standard deviations.

Table 2
Difference Scores and Standard Deviations

	PACER			Vertical jump			Illinoi agility		
Group	***n***	***M***	***SD***	***n***	***M***	***SD***	***n***	***M***	***SD***
Control	19	6.21	5.85	19	0.39	1.93	19	-1.28	1.60
Roller skating	25	4.60	4.26	24	1.27	1.84	25	-1.12	1.86
In-line skating	26	7.12	5.66	23	0.67	1.69	22	-0.40	1.62

Discussion

Those who participated in roller skating showed significance compared to those who participated in in-line skating. Because there is no research to compare these findings, these unique results suggest that roller skating is a better activity to improve eyes-closed static balance than is in-line skating. There are a few speculative theories for why this phenomenon may have occurred. First, the finding suggests that differences in the material used in the construction of the skate, leather for the roller skates and molded plastic for in-line skates, may have influenced the ankle strength the skater needed to maintain balance when using the leather boot roller skates. The leather boot is more pliable, which may require the ankle to "work harder" to maintain balance. Another possibility is that an increase in the frictional force may be required to roller skate than to in-line skating, where an increase in frictional forces requires participants to work "harder," thus increasing their lower body strength (McGinnis, 2013). The increase in friction could be attributed to two factors: the design of the skate and wheels in contact with the surface. The design of the roller skate places the wheels in a side-by-side (two in front and two in back) pattern, whereas the in-line skate places the wheels in a linear pattern. This design may require participants who roller skate to lift their legs higher so the wheels do not come into contact during the recovery phase in the gait while skating. This could place an increased workload on the weight-bearing leg, thus increasing proprioception and strength to maintain balance. Additionally, the differences in wheel size may be a factor related to friction. In-line skate wheels are taller and thinner compared to the smaller and wider roller skate wheels. These two design differences

could be an influencing factor on the potential for an increase in friction. However, to date, there is no research to back these theories and future research would need to investigate why roller skating was found to improve balance more than in-line skating was.

While no studies explaining these differences between roller and in-line skating were found in the literature, Muehlbauer et al. (2013) concluded that in-line skating induced a significance in a child's balance when measured with the Star Excursion Balance Test (measures both static balance and dynamic balance) in comparison to a nonskating control group. Even though, this study did not find significance in the control group compared to the in-line group in balance, the teacher stated that several participants at the beginning of the unit who needed assistance (carpet pads, use of the wall, partners, or ball cages with wheels) no longer needed assistance at the end of the intervention. Furthermore, students were required to push the limits of their comfort zone by participating in activities such as an obstacle course and slalom by weaving in and out of cones or other barriers. In addition, activities such as Limbo and Shoot the Duck required students to either shift their center of gravity and/or balance on one leg for a given length of time (Skatetime, 2013a, 2013b, 2017, 2018; Skate in School, 2016a, 2016b). Movement games (Noodle Tag, Side-by-Side Tag, and High-5 Tag) reinforced the development of balance in participants when having to duck, dodge, and jump to avoid being tagged or when trying to tag other participants (Skatetime, 2013a, 2013b, 2017, 2018; Skate in School, 2016a, 2016b). All these kinesthetic changes, such as turning, twisting, and spinning actions in skating, place a high demand on the vestibular organs and muscular systems in the improvement of balance.

Research involving ice skating, as opposed to in-line skating, revealed that children (Fragala-Pinkham et al., 2009; Keller et al., 2014; Walsh & Scharf , 2014) and older adults (Lamoth & Heuvelen, 2012) who participated in various ice-skating programs had a significant improvement in balance. Additionally, research has demonstrated that activities that improve balance can indirectly influence other factors such as explosive power and agility (Granacher et al., 2010; Hrysomallis, 2011; Yaggie & Campbell, 2006). While ice skating was not one of the treatment groups for this study, the similarities

it shares with roller skating and in-line skating suggest that it can induce improvements in balance.

Skating not only has several health benefits (Keller et al., 2014; Melanson, Freedson, & Jungbluth, 1996; Melanson, Freedson, Webb, et al., 1996; Muehlbauer et al., 2013; Orepic et al., 2014) but can also be fun. Fromel et al. (2017) and Wilson et al. (2005) found that girls rated skating as one of their top choices, boys to a lesser degree, of activities that not only promotes a healthy lifestyle but also allows them to engage socially with their peers. These findings reflected the teacher's observation during the skating intervention that skating reinforces the development of soft skills such as social development and personal behavior while meeting the recommended standards by SHAPE America (2013). Students were observed demonstrating personal responsibility by maintaining a clean and safe skating environment by making sure that skates, helmets, elbow pads, wrist guards, and other equipment were properly stored after each lesson. Additionally, remarks from the teacher indicated that the skating unit was a positive addition to the school day and a viable possibility in future physical education curriculum.

In conclusion, the purpose of this study was to determine the effects of a skating unit on the fitness level of fifth-grade students. Overall, the data suggest that roller skating, compared to in-line skating, is more beneficial for a participant's static balance. However, the pretest and posttest difference for cardiovascular fitness, explosive power, and agility clearly indicate improvements. While these factors were nonsignificant, the data suggest that these fitness factors can improve during a skating unit. This study illustrates that a nontraditional activity such as skating could be an effective teaching tools utilized by physical education teachers to improve fitness in children.

References

American Heart Association. (2015, August 17). *American Heart Association recommendations for physical activity in adults*. https://web.archive.org/web/20160301085050if_/http://www.heart.org/HEARTORG/HealthyLiving/PhysicalActivity/FitnessBasics/American-Heart-Association-Recommendations-for-Physical-Activity-in-Adults_UCM_307976_Article.jsp#.VtVX9evLf0o

American Heart Association. (2016, October 18). *The AHA's recommendations for physical activity in children*. https://web.archive.org/web/20170201233008if_/http://www.heart.org/HEARTORG/HealthyLiving/HealthyKids/ActivitiesforKids/The-AHAs-Recommendations-for-Physical-Activity-in-Children_UCM_304053_Article.jsp#.WJJvjOvLf0o

Cheah, P. Y., Cheong, J. P. G., Razman, R., & Zainal Abidin, N. E. (2017). Comparison of vertical jump height using the force platform and the vertec. In F. Ibrahim, J. P. G. Cheong, J. Usman, M. Y. Ahmad, R. Razman, & V. S. Selvanayagam (Eds.), *IFMBE proceedings: Vol. 58* (pp. 155–158). Springer. https://doi.org/10.1007/978-981-10-3737-5_33

Chu, D. (1998). *Jumping into plyometrics* (2nd ed.). Human Kinetics.

Dawes, J., Roozen, M., & National Strength and Conditioning Association. (2012). *Developing agility and quickness*. Human Kinetics.

Fragala-Pinkham, M. A., Dumas, H. M., Boyce, M., Peters, C. Y., & Haley, S. M. (2009). Evaluation of an adaptive ice skating programme for children with disabilities. *Developmental Neurorehabilitation*, *12*(4), 215–223. https://doi.org/10.1080/17518420902980100

Fromel, K., Kudlacek, M., Groffik, D., Svozil, Z., Simunek, A., & Garbaciak, W. (2017). Promoting healthy lifestyle and well-being in adolescents through outdoor physical activity. *International Journal of Environmental Research and Public Health*, *14*(5), 533–533. https://doi.org/10.3390/ijerph14050533

Gold, N. (2006). *Rolling with the flow (skating as physical fitness method)*. Aerobics and Fitness Association of America.

Granacher, U., Gollhofer, A., & Kriemler, S. (2010). Effects of balance training on postural sway, leg extensor strength, and jumping height in adolescents. *Research Quarterly for Exercise and Sport*, *81*(3), 245–251. https://doi.org/10.1080/02701367.2010.10599672

Hammami, R., Granacher, U., Makhlouf, I., Behm, D., & Chaouachi, A. (2016). Sequencing effects of balance and plyometric training on physical performance in youth soccer athletes. *Journal of Strength and Conditioning Research*, *30*(12), 3278–3289. https://doi.org/10.1519/JSC.0000000000001425

Hrysomallis, C. (2011). Balance ability and athletic performance. *Sports Medicine*, *41*(3), 221–32. https://doi.org/10.2165/11538560-000000000-00000

Jones, J. (n.d.). *Stats: Measures of position*. https://people.richland.edu/james/lecture/m170/ch03-pos.html

Keller, M., Röttger, K., & Taube, W. (2014). Ice skating promotes postural control in children. *Scandinavian Journal of Medicine & Science in Sports*, *24*(6), E456–461. https://doi.org/10.1111/sms.12230

Lamoth, C. J., & van Heuvelen, M. J. (2012). Sports activities are reflected in the local stability and regularity of body sway: Older ice-skaters have better postural control than inactive elderly. *Gait & Posture*, *35*(3), 489–493. https://doi.org/10.1016/j.gaitpost.2011.11.014

Leard, J. S., Cirillo, M. A., Katsnelson, E., Kimiatek, D. A., Miller, T. W., Trebincevic, K., & Garbalosa, J. C. (2007). Validity of two alternative systems for measuring vertical jump height. *Journal of Strength and Conditioning Research*, *21*(4), 1296–1299. https://doi.org/10.1519/00124278-200711000-00055

Léger, L. A., & Lambert, J. (1982). A maximal multistage 20-m shuttle run test to predict VO_2 max. *European Journal of Applied Physiology and Occupational Physiology*, *49*(1), 1–12. https://doi.org/10.1007/BF00428958

Léger, L. A., Mercier, D., Gadoury, C., & Lambert, J. (1988). The multistage 20 meter shuttle run test for aerobic fitness. *Journal of Sports Sciences*, *6*(2), 93. https://doi.org/10.1080/02640418808729800

McGinnis, P. (2013). *Biomechanics of sport and exercise* (3rd ed.). Human Kinetics.

McManama, J. (2014). *Physical education activity handbook* (13th ed.). Pearson.

Melanson, E. L., Freedson, P. S., & Jungbluth, S. (1996). Changes in $\dot{V}O_{2max}$ and maximal treadmill time after 9 week of running or in-line skate training. *Medicine and Science in Sports and Exercise*, *28*(11), 1422–1426. https://doi.org/10.1097/00005768-199611000-00012

Melanson, E. L., Freedson, P. S., Webb, R., Jungbluth, S., & Kozlowski, N. (1996). Exercise responses to running and in-line skating at self-selected paces. *Medicine & Science in Sports &Exercise*, *28*(2), 247–250. https://doi.org/10.1097/00005768-199602000-00014

Menschik, D., Ahmed, S., Alexander, M., & Blum, R. (2008). Adolescent physical activities as predictors of young adult weight. *Archives of Pediatrics and Adolescent Medicine*, *162*(1), 29–33. https://doi.org/10.1001/archpediatrics.2007.14

Muehlbauer, T., Kuehnen, M., & Granacher, U. (2013). Inline skating for balance and strength promotion in children during physical education. *Perceptual and Motor Skills*, *117*(3), 665–681. https://doi.org/10.2466/30.06.PMS.117x29z9

Orepic, P., Mikulic, P., Sorice, M., Ruzic, L., & Markovic, G. (2014). Acute physiological responses to recreational in-line skating in young adults. *European Journal of Sport Science*, *14*(Suppl. 1), S25–S31. https://doi.org/10.1080/17461391.2011.638936

Raya, M., Gailey, R., Gaunaurd, I., Jayne, D., Campbell, S., Gagne, E., & Tucker, C. (2013). Comparison of three agility tests with male service members: Edgren Side Step Test, T-Test, and Illinois Agility Test. *Journal of Rehabilitation Research and Development*, *50*(7), 951–960. https://doi.org/10.1682/JRRD.2012.05.0096

Rinne, M., Miilunpalo, S., & Heinonen, A. (2007). Evaluation of required motor abilities in commonly practiced exercise modes and potential training effects among adults. *Journal of Physical Activity and Health*, *4*(2), 203–214. https://doi.org/10.1123/jpah.4.2.203

Schwab, K., & Dustin, D. (2014). Engaging youth in lifelong outdoor adventure activities through a nontraditional public school physical education program. *Journal of Physical Education, Recreation, and Dance*, *85*(8), 27–31. https://doi.org/10.1080/07303084.2014.946189

Skatetime. (2013a). *All new full games packet*. http://www.skatetime.com/SkateGames2013.pdf

Skatetime. (2013b). *Full games packet*. http://www.skatetime.com/skategames.pdf

Skatetime. (2017). *Instruction manual*. http://www.skatetime.com/teacher.htm

Skatetime. (2018). *Welcome to Skatetime*. http://www.skatetime.com/

Skate in School. (2016a). *Get your student's inline*. Rollerblade Inc.

Skate in School. (2016b). *Inline skating lesson plans intermediate & enrichment activities*. Rollerblade Inc.

SHAPE America. (2013). *National standards for K–12 physical education*. http://www.shapeamerica.org/standards/pe/

SHAPE America. (2016). *2016 shape of the nation: Status of physical education in the USA*. http://www.shapeamerica.org/advocacy/son/2016/upload/Shape-of-the-Nation-2016_web.pdf

Wallick, M., Porcari, J., Wallick, S., Berg, K., Brice, G., & Arimond, G. (1995). Physiological responses to in-line skating compared to treadmill running. *Medicine & Science in Sports & Exercise*, *27*(2), 242–248. https://doi.org/10.1249/00005768-199502000-00014

Walsh, S. F., & Scharf, M. G. (2014). Effects of a recreational ice skating program on the functional mobility of a child with cerebral palsy. *Physiotherapy Theory and Practice*, *30*(3), 189–195. https://doi.org/10.3109/09593985.2013.863414

Wilson, D., Williams, J., Evans, A., Mixon, G., & Rheaume, C. (2005). Brief report: A qualitative study of gender preferences and motivational factors for physical activity in underserved adolescents. *Journal of Pediatric Psychology*, *30*(3), 293–297. https://doi.org/10.1093/jpepsy/jsi039

Wood, R. (2008). *Vertical jump test*. Topend Sports. from http://www.topendsports.com/testing/tests/vert jump.htm

Yaggie, J., & Campbell, B. (2006). Effect of balance training on selected skills. *Journal of Strength and Conditioning Research*, *20*(2), 422–428. https://doi.org/10.1519/00124278-200605000-00031

The Physical Educator Vol. 78 • pp. 358–370 • 2021
https://doi.org/10.18666/TPE-2021-V78-I4-10685

FITNESS

The Perceived Effects of Psychological Skills Training on Anaerobic Performance of College Students

Nick Madera, Lawrence W. Judge, Nicholette Yates, Brian Fox, Selen Razon

Abstract

The purpose of this study was to test the perceived effects of psychological skills training (PST) on anxiety and anaerobic performance in college-aged students. Fifty-five college students (44 females, 11 males) volunteered to complete an online survey instrument. Participants were recruited via convenience sampling methods to answer questions built through a Qualtrics online survey. The questionnaire was split into two sections. The first section asked participants to identify psychological skills, their familiarity with them, and their frequency of use. The second section consisted of categorizing each skill so participants could mark the extent to which it influences their training goal. Data analysis showed males were more familiar with five out of six psychological skills when compared to females. This is result is likely due to males showing higher stress levels during training and performance compared to females. The findings of this study confirm the importance of mental health education and PST in college students.

Nick Madera, Department of Kinesiology, West Chester University. Lawrence W. Judge, School of Kinesiology, Ball State University. Nicholette Yates, Department of Kinesiology, West Chester University. Brian Fox, School of Kinesiology, Ball State University. Selen Razon, Department of Kinesiology, West Chester University. Please send author correspondence to LWJudge@bsu.edu

Optimizing performance is one of the most sought out aspects of sport and exercise psychology. Individuals who struggle with performance during training or competition often lack the fundamental mental skills (i.e., mental coping strategies) rather than the physical attributes. The application of psychological interventions and techniques can lead to improvements in athletic behavior during training or competition (Keeler, 2006). One of the most researched mental interventions is psychological skills training (PST), which can be defined as the systematic and consistent practice of mental or psychological skills for the purpose of enhancing performance, increasing enjoyment, or achieving greater sport and physical self-satisfaction (Weinberg & Gould, 2018). Simply put, PST is training exercisers to learn mental skills that help these performers regulate their psychological state. Daily implementation of consistent processes may increase the likelihood that an individual reaches optimal focus resulting in a state of flow (Judge et al., 2010).

The most common psychological skill training interventions include imagery, goal setting, self-talk, and arousal control (Birrer & Morgan, 2010). Additionally, centering, mental rehearsal, and attention-shifting are known to help performance and are thus used in interventions (Coetzee et al., 2006; Sherwood et al., 2014; Rogerson & Hrycaiko, 2002). Sport and exercise psychologists use PST to teach individuals how to perform at the highest level possible regardless of the presented conditions. Increasing movement efficiency, limiting external distractions, focusing attention on relevant cues, and reducing negative emotions are expected responses from a properly implemented PST protocol (Röthlin et al., 2016).

The literature on PST has become increasingly available as the importance of mental health collides with exercise and sport. Weinberg and Williams (2001) reported on 45 studies. Of those, over 85% of the studies found positive performance outcomes associated with implementing PST into individual or group mental skill strategies. PST has been shown to be effective at enhancing athletic performance in a variety of sports and settings (Beauchamp et al., 1996; Hardy et al., 1996; Sheard & Golby, 2006). To that end, some studies have even shown performance benefits in as young as 12-year-old professional gymnasts (Fournier et al., 2005). The common ground on performance increases during PST interventions is

gym training. Success in training often leads to success elsewhere. It is important to note that almost all sports and athletic endeavors that seek to optimize performance utilize anaerobic training to an extent (Kraemer et al., 2002).

The American College of Sports Medicine (ACSM, 2013) defines anaerobic exercise as intense physical activity of short duration, fueled by the energy sources within the contracting muscles and independent of inhaled oxygen sources. Anaerobic exercise relies on fast-twitch muscles, which are responsible for high power and force outputs. The most common anaerobic activities include sprinting, rowing, cycling, and weight lifting and powerlifting. For the purpose of this study, anaerobic performance strictly refers to activities that use weight lifting or its derivatives.

All exercise places stress on the body, and the extent to which it influences physical and mental properties depends on the intensity, duration, and frequency. Increases in heart rate (HR) and respiratory rate (RR) are common physiological and psychological responses to stress (Patel et al., 2017). Anaerobic performance tends to induce rapid spikes in HR and RR due to high forces being produced over short periods. As stress increases past a certain threshold, cognitive and biomechanical functioning decreases (Hanin, 2007). In certain high-intensity exercise environments, acute stress is often expected, but if left unchecked, it can negatively impact performance. PST aids in minimizing those stress responses and controlling arousal level (Bali, 2015).

Although a wealth of exercise and sport psychology information is available, the recommended protocols are often quite generic. Even with adequate available information, there is an extreme limit on research for the psychological demands of a specific sport. Thus, it can be hard to generalize this information to specific sports, as the performance tasks for an Olympic weightlifter, for example, differ greatly from those of a 200-m sprinter. When presenting the framework for psychological demand in sport, one must look at and test multiple variables. Duration, intensity, frequency, complexity and variability of action, movement pattern, team cooperation, and fluidity are variables that influence the psychological skills required for performance success (Birrer & Morgan, 2010; Schnabel et al., 2008). This creates a one-size-fits-all mindset that makes it difficult

to connect sport-specific variables to the psychological skills best suited for the athlete. Narrowing down the exact recommendations to best utilize PST is a great starting point for future researchers.

Despite evidence that PST has positive effects on exercise and athletic performance, many studies fall short when investigating empirical evidence. In a meta-analysis, Gardner and Moore (2006) explored the efficacy of PST using objective measurements. Of the over 104 studies assessed, only a small fraction met the criteria for appropriate design and methodology, and an even smaller fraction showed tangible performance enhancements. Furthermore, almost all studies involving PST tested skilled or professional athletes. This leaves a gap in available recommendations for the average, college-aged individual who stands to benefit equally from these interventions. The most meaningful research targeting college-aged individuals regarding PST comes from the push to include these interventions in academic courses (Curry & Maniar, 2003). The purpose of this pilot study was to identify the extent to which college students use psychological skills and the impact it has on their anaerobic training regiments and performance. We hypothesized that women would utilize PST to a greater degree than men. We also hypothesized that the overall stress during training and performance would be considerably higher for men.

Method

Participants

Sixty-nine participants submitted responses for an online questionnaire. Of those participants, 14 either did not meet the inclusion criteria or did not completely fill out the form and thus their data were removed from the set. The age of the participants ranged from 18 to 25 (M = 21.02, SD = 2.51 years), with 89% of the population responding that they were Caucasian (n = 49). In the end, 55 usable surveys were available for data analysis. Participants were randomly sampled from a college in the Northeastern United States and two surrounding universities. Participants were required to be college age (between 18 and 25 years of age) and participating in regular aerobic activity (at least three times a week for 60 min) for at least the past 18 months. Only healthy participants who completed a demographic survey and provided informed consent were included in

the study. The university's institutional review board (IRB) approved this study and no data collection occurred prior to this approval.

Protocol

Demographic Form

The demographic form verified participants met the inclusion criteria prior to online submission. Additionally, demographic variables such as gender and race were added to the survey instrument.

Psychological Skills Questionnaire

The psychological skills questionnaire included 11 questions that combined the previously validated scales of Athletic Coping Skills Inventory 28 (ACSI-28) and the Psychological Skills Inventory for Sports Form-5 (PSIS). The questionnaire helped measure participants' psychological skills related to training and performance, as well as their level of comfort and familiarity with these skills.

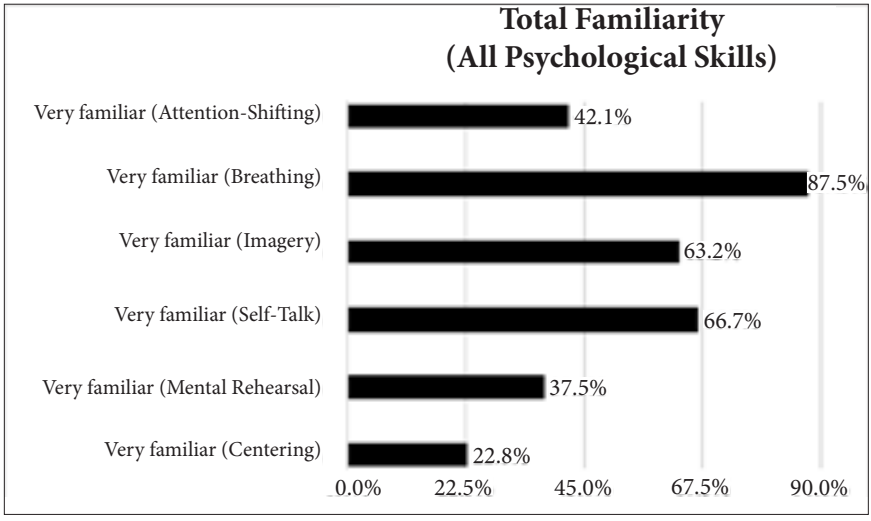
Statistical Analyses

Descriptive statistics were computed with IBM SPSS 23, showing participants' familiarity levels with PST. Frequency of PST use between genders was computed by means of Mann–Whitney U nonparametric tests, showing differences between median ranks of men and women. Significance level was set at .05.

Results

Due to the sample size consisting of majority females (F = 44, M = 11), the distribution of the data is slightly skewed. From the total count of college-aged individuals with familiarity of PST, over 50% categorized as very familiar only three of the six listed skills (Figure 1). Of all the skills (see Table 1), the participants were most familiar with breathing (87.5%, N = 48) and the least familiar with centering (22.8%, N = 12).

Figure 1
Total Familiarity Between Males and Females Across All Psychological Skills Presented



In terms of familiarity, two significant differences were found. Men were found to be more familiar with mental rehearsal compared to women (female rank: 25.16; male rank: 39.36; $p = .004$), and women were found to be more familiar with breathing as a psychological technique compared to men (female rank: 29.15; male rank: 21.05; $p = .009$). There were no significant differences in familiarity between men and women for the remaining four skills ($p > .05$).

In terms of inclusion of psychological skills into training, men were only slightly more likely to incorporate these skills compared to women (female rank: 25.94; male rank: 36.23; $p = .047$). No significant differences were found between sexes in effectiveness of the skills, visualization, inclusion of pregame rituals, or frequency of stress (Table 2; $p > .05$).

Table 1
Gender Familiarity With Psychological Skills Training

Answer to the question, are you familiar with the following examples of psychological skills?	Total	Female	Male
Total count	55	44	11
Centering			
Not at all familiar	40.4%	45.7%	18.2%
Somewhat familiar	36.8%	32.6%	54.5%
Very familiar	22.8%	21.7%	27.3%
Mental rehearsal			
Not at all familiar	17.9%	22.2%	0.0%
Somewhat familiar	44.6%	48.9%	27.3%
Very familiar	37.5%	28.9%	72.7%
Self-talk			
Not at all familiar	7.0%	6.5%	9.1%
Somewhat familiar	26.3%	30.4%	9.1%
Very familiar	66.7%	63.0%	81.8%
Imagery			
Not at all familiar	10.5%	10.9%	9.1%
Somewhat familiar	26.3%	28.3%	18.2%
Very familiar	63.2%	60.9%	72.7%
Breathing			
Not at all familiar	1.8%	0.0%	9.1%
Somewhat familiar	10.7%	6.7%	27.3%
Very familiar	87.5%	93.3%	63.6%
Attention-shifting			
Not at all familiar	15.8%	17.4%	9.1%
Somewhat familiar	42.1%	43.5%	36.4%
Very familiar	42.1%	39.1%	54.5%

Table 2
Frequency of Stress During Exercise and Performance

Answer to the question, do you experience any signs of stress during training or performance?	Gender		
	Total	Female	Male
Total count	55	44	11
About half the time (50%)	21.1%	21.7%	18.2%
Always (100%)	3.5%	0.0%	18.2%
Most of the time (75%)	14.0%	17.4%	0.0%
Never (0%)	12.3%	10.9%	18.2%
Sometimes (25%)	49.1%	50.0%	45.5%

As familiarity with mental rehearsal and breathing differed significantly, their inclusion into performance and training differed as well. Men were more likely to include mental rehearsal into their performance and training compared to women (female rank: 25.86; male rank: 36.55; $p = .036$), and women were more likely to incorporate breathing as a psychological skill into their performance and training compared to men (female rank: 30.07; male rank: 19.73; $p = .023$). No significant differences were found between sexes for the remaining four skills ($p > .05$).

No significant differences were found between sexes for focusing attention, positive self-talk, shifting attention, or taking breaths to remain focused ($p > .05$).

Discussion

The purpose of this pilot study was to identify the extent to which college-aged individuals utilize psychological skills and the impact it has on their anaerobic training regimens and performance. First, we hypothesized that women would utilize PST to a greater degree than men. Second, we hypothesized that the overall stress during training and performance would be considerably higher for men. There is a paucity of literature on gender differences and PST. The results of this pilot study did not display a strong enough connection for us to make concrete conclusions.

Regarding the first hypothesis, males had more overall familiarity with psychological skills during training and performance. This contradicts most research on stressors and coping between genders in sport. The typical results of gender differences are in favor of females being significantly better at problem-solving, planning, communication, and utilizing psychological skills (Nicholls et al., 2007).

However, the data support our second hypothesis. Men reported higher rates of stress during training and performance. These data assume training stressors are individual and not team-based or coaching influenced, which best reflects the defined parameters of anaerobic performance mentioned in the introduction. These data are further consistent with the literature that showed males consistently score higher on competitiveness and win-orientation than females (Gill, 1998). Men placing themselves in highly competitive environments can be a precursor for added stress, especially when in a performance-idolized setting.

According to Judge et al. (2010), the goal of flow is to create the idyllic mindset that enables the body to function automatically with little conscious effort. Sport and exercise psychology consultants often refer to the optimal mindset as a flow state or being in "the zone" (Judge et al., 2010). Additionally, training collegiate recreation professionals to implement a PST program may help bring the need for sport and exercise psychology to the forefront of their minds. That way, individuals utilizing facilities and classes on college campuses can have at their disposal all the physical and mental tools that they need to reach the flow state and get the most out of their recreation fitness activities. Last, training professionals in this subject matter may help foster a consistency with mental training that seems to be a factor in helping individuals achieve flow as they establish healthy lifestyle patterns.

Limitations

This study is not without limitations. With retrospective designs, subjects' recall could be limited. A larger sample would have served to increase the statistical power for this research. This descriptive study could have included a stronger qualitative component such as

a number of short open-ended questions that relate to topics such as time spent training and hours performed per month. The reply to these questions would have further bridged the gap on current research and would have allowed for more meaningful conclusions. Giving voice to the viewpoints expressed in the survey data could have added depth to the results. The discussion of the study, therefore, was limited to issues potentially surrounding the quantitative descriptive data collected.

While there was a lack of data that explained which psychological skill best influenced training and performance for college-aged individuals, there were some important findings on gender differences. College-aged males reported higher levels of stress during performance, but also showed greater knowledge on PST. The data showed the importance of PST and mental skills education; however, further research needs to thoroughly investigate which psychological skill has the greatest impact on performance and stress reduction for this specific population.

Conclusion

College students have a lot of potential obstacles when it comes to staying healthy. There is the stress of rigorous coursework, work, overscheduled calendars, and newly found emancipation. College campuses often have a variety of resources available (e.g., recreation facilities and fitness classes) to help students get fit and stay healthy. But exercise can sometimes be stressful to the body; the extent to which stress influences physical and mental properties depends on the volume, intensity, and density of the task. PST is as important to the individual as the physical training and can make a large contribution (between 50% to 90%) to their performance. Goal setting, self-talk, mental imagery, mental rehearsal, and relaxation are among the methods that individuals utilize to assist with PST (Birrer & Morgan, 2010). Narrowing down recommendations for college-aged participants to best utilize PST is a great starting point. Most of the available PST research has focused on competitive (high performance) athletes. The lack of research on this important demographic leaves a gap in recommendations for the average, college-aged individual who stands to benefit from these interventions as they attempt to establish healthy lifelong exercise patterns.

References

American College of Sports Medicine. (2013). *ACSM's guidelines for exercise testing and prescription*. Lippincott Williams & Wilkins.

Bali, A. (2015). Psychological factors affecting sports performance. *International Journal of Physical Education, Sports, and Health*, *1*(6), 92–95.

Beauchamp, P. H., Halliwell, W. R., Fournier, J. F., & Koestner, R. (1996). Effects of cognitive-behavioral psychological skills training on the motivation, preparation, and putting performance of novice golfers. *The Sport Psychologist*, *10*(2), 157–170. https://doi.org/10.1123/tsp.10.2.157

Birrer, D., & Morgan, G. (2010). Psychological skills training as a way to enhance an athlete's performance in high-intensity sports. *Scandinavian Journal of Medicine & Science in Sports*, *20*(S2), 78–87. https://doi.org/10.1111/j.1600-0838.2010.01188.x

Coetzee, B., Grobbelaar, H. W., & Gird, C. C. (2006). Sport psychological skills that distinguish successful from less successful soccer teams. *Journal of Human Movement Studies*, *51*(6), 383–402.

Curry, L., & Maniar, S. (2003). Academic course combining psychological skills training and life skills education for university students and student-athletes. *Journal of Applied Sport Psychology*, *15*(3), 270–277. https://doi.org/10.1080/10413200305384

Fournier, J. F., Calmels, C., Durand-Bush, N., & Salmela, J. H. (2005). Effects of a season-long PST program on gymnastic performance and on psychological skill development. *International Journal of Sport and Exercise Psychology*, *3*(1), 59–78. https://doi.org/10.1080/1612197X.2005.9671758

Gardner, F., & Moore, Z. (2006). *Clinical sport psychology*. Human Kinetics. https://doi.org/10.5040/9781492595335

Gill, D. L. (1988). Gender differences in competitive orientation and sport participation. *International Journal of Sport Psychology*, *19*(2), 145–159.

Hanin, Y. L. (2007). Emotions and athletic performance: Individual zones of optimal functioning model. In D. Smith & M. Bar-Eli (Eds.), *Essential readings in sport and exercise psychology* (pp. 55–73). Human Kinetics.

Hardy, L., Jones, J. G., & Gould, D. (1996). *Understanding psychological preparation for sport: Theory and practice of elite performers*. John Wiley & Sons.

Judge, L. W., Bell, R., Bellar, D., & Wanless, E. (2010). Developing a mental game plan: Mental periodization for achieving a "flow" state for the track and field throws athlete. *The Sport Journal*, *13*(4). https://thesportjournal.org/article/developing-a-mental-game-plan-mental-periodization-for-achieving-a-flow-state-for-the-track-and-field-throws-athlete/

Keeler, L. A. (2006). *The transtheoretical model and psychological skills training: Application and implications with elite female athletes* [Doctoral dissertation]. The Research Repository at WVU. https://researchrepository.wvu.edu/cgi/viewcontent.cgi?article=5277&context=etd

Kraemer, W. J., Ratamess, N. A., & French, D. N. (2002). Resistance training for health and performance. *Current sports medicine reports*, *1*(3), 165–171. https://doi.org/10.1249/00149619-200206000-00007

Nicholls, A. R., Polman, R., Levy, A. R., Taylor, J., & Cobley, S. (2007). Stressors, coping, and coping effectiveness: Gender, type of sport, and skill differences. *Journal of Sports Sciences*, *25*(13), 1521–1530. https://doi.org/10.1080/02640410701230479

Patel, H., Alkhawam, H., Madanieh, R., Shah, N., Kosmas, C. E., & Vittorio, T. J. (2017). Aerobic vs anaerobic exercise training effects on the cardiovascular system. *World Journal of Cardiology*, *9*(2), 134–138. https://doi.org/10.4330/wjc.v9.i2.134

Rogerson, L. J., & Hrycaiko, D. W. (2002). Enhancing competitive performance of ice hockey goaltenders using centering and self-talk. *Journal of Applied Sport Psychology*, *14*(1), 14–26. https://doi.org/10.1080/10413200209339008

Röthlin, P., Birrer, D., Horvath, S., & Grosse Holtforth, M. (2016). Psychological skills training and a mindfulness-based intervention to enhance functional athletic performance: Design of a randomized controlled trial using ambulatory assessment. *BMC Psychology*, *4*(1), Art. 39. https://doi.org/10.1186/s40359-016-0147-y

Schnabel, K., Asendorpf, J. B., & Greenwald, A. G. (2008). Using implicit association tests for the assessment of implicit personality self-concept. In G. J. Boyle, G. Matthews, & D. H. Saklofske (Eds.), *Handbook of personality theory and testing* (pp. 508–528). Sage.

Sheard, M., & Golby, J. (2006). Effect of a psychological skills training program on swimming performance and positive psychological development. *International Journal of Sport and Exercise Psychology*, *4*(2), 149–169. https://doi.org/10.1080/1612197X.2006.9671790

Sherwood, D. E., Lohse, K. R., & Healy, A. F. (2014). Judging joint angles and movement outcome: Shifting the focus of attention in dart-throwing. *Journal of Experimental Psychology: Human Perception and Performance*, *40*(5), 1903–1914. https://doi.org/10.1037/a0037187

Weinberg, R. S., & Gould, D. (2018). *Foundations of sport and exercise psychology* (7th ed.). Human Kinetics.

Weinberg, R. S., & Williams, J. M. (2001). Integrating and implementing a psychological skills training program. In J. M. Williams (Ed.), *Applied sport psychology: Personal growth to peak performance* (4th ed., pp. 347–377). Mayfield.

The Physical Educator Vol. 78 • pp. 371–383 • 2021
https://doi.org/10.18666/TPE-2021-V78-I4-10297

FITNESS/PHYSICAL ACTIVITY

Relationship Between Health-Related Fitness Knowledge, Physical Activity Intensity, and Activity Levels in High School Students

Carol Wilkinson and Keven A. Prusak

Abstract

The purpose of this study was to explore the relationship between health-related fitness knowledge (HRFK) and various intensity and activity levels of physical activity in male and female high school students. At the end of a Fitness for Life course, high school students (N = 280) completed a HRFK questionnaire and the Leisure-Time Physical Activity Questionnaire (Godin & Shephard, 1985). Pearson correlations were computed among physical activity levels (mild, moderate, and strenuous). A one-way MANOVA with appropriate follow-up univariate ANOVAs examined the effect of gender on physical activity intensity scores (total, healthy, and strenuous). A one-way ANOVA examined the difference in HRFK scores between the active group and the less active group. Results showed no significant correlation between HRFK and all physical activity scores. Females had higher HRFK scores and males had higher physical activity scores for all intensity levels. Ninety-two percent of all students were classified as active and males were more active than females. There was no significant difference in HRFK scores between the active group and the less active groups.

Carol Wilkinson, Department of Teacher Education, Brigham Young University. Keven A. Prusak, Department of Teacher Education, Brigham Young University. Please send author correspondence to carol_wilkinson@byu.edu

Many people believe that engaging in physical activity (PA) is vital in helping to prevent obesity and its attendant diseases (Rogers et al., 2008). PA provides beneficial effects for overweight youth, blood pressure in hypertensive individuals, bone mass, cardiorespiratory health, and psychological well-being (Trost & Loprinzi, 2008). For several years, physical education programs in schools have been recommended as the ideal means for promoting lifetime activity in the adolescent population (Sallis et al., 2012). Yet while physical education should promote lifetime PA, the traditional sports-based physical education programs often offered in schools have had limited success in achieving this aim (Dale & Corbin, 2000; Pangrazi, 2010).

Conceptual Physical Education

To tackle this problem, many high schools in the United States have introduced conceptual physical education (CPE) with a health promotion emphasis as a curricular model (Ayers, 2004). Such CPE courses generally include lessons that teach important health and fitness concepts linked with activity sessions that teach application of these principles and also individual fitness assessments, self-monitoring skills, and fitness programming (Dale & Corbin, 2000). The belief behind the development of CPE is that if students gain knowledge about health-related fitness benefits, they will be more likely to develop good attitudes toward PA and choose more active lifestyles than people not exposed to such information (Goldfine & Nahas, 1993). Indeed, Ennis (2010) suggested that teaching fitness knowledge in physical education is crucial in encouraging lifetime PA.

Some research has examined how high school CPE relates to student health-related fitness knowledge (HRFK), attitudes toward PA, and PA behaviors. Goldfine and Nahas (1993) studied an implemented CPE versus traditional physical education at the high school level and found that CPE was related to better HRFK and more positive student attitudes toward PA. However, there was no difference in PA behaviors between the two groups.

Ferguson et al. (1989) found no relationship between middle school students' HRFK and PA exercise intention. Similarly, Haslem et al. (2016), using structural equation modeling, examined the relationship between student HRFK and overall PA associated with

participating in a Fitness for Life course (a state requirement in high schools), but found none. Conversely, however, DiLorenzo et al.'s (1998) study with eighth- and ninth-grade students found that exercise knowledge was a predictor of PA for both males and females.

CPE Using Fitness for Life

The *Fitness for Life* (Corbin & Le Masurier, 2014) textbook provides extensive CPE course materials that were used in this study. It is just one example of CPE courses that are being taught in high schools in the United States. The aim of the Fitness for Life course is to help students develop the knowledge, skills, and dispositions needed to make effective decisions about personal fitness and wellness. Another study (Thompson & Hannon, 2012) revealed no gender differences on HRFK and PA in high school students who had completed a Fitness for Life course. However, there was a moderate, positive correlation between HRFK and PA; that is, students who scored higher on the HRFK test were also more physically active.

Activity and Intensity Levels of PA

In Thompson and Hannon's (2012) study, the researchers also looked at specific activity levels (frequency of participation) in activities that made students breathe hard. They classified students who had scores of 1–2 on the Physical Activity Questionnaire for Adolescents as low active, scores of 3 as moderately active, and scores of 4–5 scores as high active. They found significant HRFK score differences between low active students and moderately active students, and between low active students and high active students, meaning students with greater HRFK reported higher PA levels.

Other research has also focused on specific activity levels. In Dale et al.'s (1998) study, they classified students as active if they engaged in moderate activity 5 days/week, vigorous activity 3 days/week, muscle fitness 3 days/week, and flexibility 3 days/week. Students were defined as sedentary if they engaged in moderate activity 0–2 days/week and vigorous activity 0–2 days/week. Two groups of ninth graders (CPE and traditional PE) were examined for any lasting effects of these courses on student PA behaviors over the next 3 years of high school. They found that females who had taken CPE in Grade 9 were more active after Grade 11 in strength activities than females in the traditional physical education group and less likely to report

sedentary behaviors. They also found that males in Grade 12 who had taken CPE 2 years earlier participated in moderate activity more than males in traditional physical education.

In a follow-up study, Dale and Corbin (2000) used the same active classification (excluding the flexibility component). Sedentary was classified as 0 days of moderate and vigorous activity. They studied the same students as used by Dale et al. (1998) after those students had graduated from high school and results showed more males from the original CPE group reported they were vigorously active 12 months beyond graduation compared to the group that originally took traditional physical education (Dale & Corbin, 2000). However, in neither study did they examine the relationship of HRFK to PA rates.

Looking specifically at PA intensity levels, Keating et al. (2010) examined HRFK and its relationship to PA levels of intensity with a college population. The levels were specified as vigorous PA, moderate PA, and light PA. They found no significant HRFK differences in any of the levels of PA.

Because research concerning high school CPE and its resultant HRFK as it relates to students' activity and intensity levels of PA is scant and shows mixed results, the relationship between these factors should be more thoroughly examined. Therefore, the purpose of this study was to explore the relationship between HRFK and various intensity and activity levels of PA across male and female high school students.

Method

Participants

This study was conducted in a state in the Intermountain West of the United States that requires high school students to take a Fitness for Life course. Participants were students enrolled in Fitness for Life courses in five high schools in two school districts. Two hundred eighty high school students (125 males, 155 females) were just completing a Fitness for Life course. Participants ranged in age from 15 to 18 years (M = 16) and were Caucasian (n = 224, 80%), Hispanic (n = 36, 12.8%), Asian (n = 8, 2.9%), Pacific Islander (n = 7, 2.5%), and African American (n = 5, 1.8%). Thirty-one percent of the students were on free or reduced lunch.

The teachers (4 men, 4 women) of the Fitness for Life courses had teaching experience that ranged from 6 to 26 years ($M = 13$). All of them said they taught the material outlined in the *Fitness for Life* textbook during the course and used a blend of lecture (four teachers taught HRFK in a classroom and the remaining four teachers taught HRFK in the gym) and lab activities in the gym. The time spent on lectures varied from 15% to 60% ($M_{time} = 28\%$) of total teaching, with the rest of the time spent on lab activities. We made no attempt to intervene in the way the Fitness for Life course was taught.

Instruments

Two instruments were used in this study in the assessment of student HRFK and PA behaviors.

Health-Related Fitness Knowledge Questionnaire

The Health-Related Fitness Knowledge Questionnaire (HRFKQ) consisted of 22 multiple-choice questions (each question was worth 1 point) selected from the Fitness for Life test bank. Each question focused on practical application of the five components of health-related fitness: cardiovascular fitness, flexibility, muscular strength, muscular endurance, and body composition (Corbin & Lindsey, 2005). Here is an example of a stem: "National guidelines state that teenagers should engage in vigorous activity for." The student selects the answer from four choices, and in this example, the answer is "20 minutes, 3 or more times per week." The student's score out of 22 possible points was used as the HRFK score in analysis. According to Thompson and Hannon (2012), the HRFKQ is a valid instrument for measuring HRFK because the items were developed by the creators of the Fitness for Life curriculum and therefore had high content and face validity.

Leisure-Time Physical Activity Questionnaire

The Leisure-Time Physical Activity Questionnaire (LTPAQ; Godin & Shephard, 1985) measures PA behavior by a self-reported 7-day recall. The individual records the number of times that they engage in PA of varying intensity, that is, strenuous, moderate, and mild, during a typical week. Several researchers have confirmed the validity of the LTPAQ and stated reliability of alpha greater than .74 (see Godin & Shephard, 1985; Sallis et al., 1993). Student responses

were also calculated to determine three scores: a weekly Total PA score (mild, moderate, and strenuous PA combined), a Healthy PA score (moderate and strenuous PA combined), and a strenuous PA score as specified by Godin (2011). Godin stated that scores greater than or equal to 24 indicate an individual is active, between 14 and 23 moderately active, and less than 14 insufficiently active.

Procedures

Prior to the study, the university's Institutional Review Board, both school districts, and all principals at the participating high schools gave approval for the study. The Fitness for Life teachers attended a training seminar so they would know their role in distributing consent/assent forms and in administering each of the questionnaires to their students. Parental consent and child assent forms were obtained from students who volunteered to be part of the study and complete the questionnaires.

The Fitness for Life teachers administered the HRFKQ 2 weeks before the course finished. The LTPAQ was administered 1 week later. During the time the questionnaires were being administered, students who did not volunteer for the study completed an alternative assignment. Also, during this time, we carried out procedural checks by making random visits to the schools to ensure the appropriate protocol was being followed regarding administration of questionnaires.

Data Analysis

Data were entered into a Microsoft Excel file and missing data were dealt with using a list-wise deletion. We used IBM SPSS Statistics for Windows version 25 (2017) to analyze the data. Means and standard deviations were computed for all dependent variables. Pearson correlations were computed among the three levels of LTPAQ PA (mild, moderate, and strenuous) so that we could assess the strength and direction of their relationship to HRFK. A one-way MANOVA and follow-up univariate ANOVAs for post hoc comparisons were computed so that we could examine the gender effect on PA intensity scores (total PA, strenuous PA, and healthy PA). Effect sizes were calculated for each significant difference using eta-squared.

Substantial health benefits occur when students are active (24 units or more), as defined by Godin (2011), that is, when only

moderate and strenuous PA is used in the LTPAQ calculation. There were not enough numbers in either the moderately active group (14 to 23 units) or insufficiently active group (less than 14 units) to have statistical power, so we combined these two groups (labeled less active). A one-way ANOVA was calculated to find out if there was a significant difference in HRFK scores between the active group and the less active group.

Results

Table 1 shows the correlation matrix. There was no significant correlation between HRFK and strenuous PA, moderate PA, and mild PA. There were significant positive, moderate correlations between strenuous PA and moderate PA and between moderate PA and mild PA. There was a significant positive, weak correlation between strenuous PA and mild PA.

Table 1
Bivariate Correlations Among Health-Related Fitness Knowledge and Physical Activity Levels for All Students

Variable	1	2	3	4
Strenuous PA	_			
Moderate PA	.30**	_		
Mild PA	.12*	.54**	_	
HRFK	-.09	-.00	.10	_

* $p = < .05$. ** $p = < .01$.

Table 2 shows the descriptive statistics (means and standard deviations) for the dependent variables. The average HRFK score was 13.49 (61%) for all students. Results of the one-way MANOVA that examined the effect of gender on the HRFK, total PA, healthy PA, and strenuous PA scores revealed a significant effect, Wilks' Λ (4, 275) = .841, p = .000. Follow-up univariate ANOVAs indicated a significant gender difference for HRFK, $F(1, 278) = 29.31$, p = .000, η^2 = .1; total PA, $F(1, 278) = 8.56$, p = .004, η^2 = .03; healthy PA, $F(1, 278) = 11.90$, p = .001, η^2 = .04; and strenuous PA, $F(1, 278) = 19.72$, p = .000, η^2 = .07. Green and Salkind (2005) proposed that eta-squared values of .01, .06, and .14 could be interpreted as small, medium, and large effect sizes, respectively.

Table 2
Descriptive Statistics for HRFK and Physical Activity Levels

	All students				Males		Females	
Variable	***M***	***SD***	**Skewness**	**Kurtosis**	***M***	***SD***	***M***	***SD***
HRFK	13.49	3.83	-.515	.033	12.18	3.75	14.55***	3.56
Total PA	68.26	33.17	1.803	6.999	74.63**	40.31	63.12	25.01
Healthy PA	54.31	28.35	1.76	7.48	60.70**	33.65	49.16	22.02
Strenuous PA	33.69	22.83	2.40	13.27	40.22***	26.90	28.42	17.29

Note. HRFK points possible = 22. Total PA (via LTPAQ) responses were calculated as a total leisurely activity score using strenuous, moderate, and mild PA scores. Healthy PA (via LTPAQ) uses only strenuous and moderate PA scores. Strenuous PA (via LTPAQ) uses only strenuous PA scores.
**$p < .01$. ***$p < .001$.

Female students had significantly higher HRFK scores (M = 14.55, 66%) than males (M =12.18, 55%). Male students had significantly higher PA scores than females for total PA, healthy PA, and strenuous PA.

In this study, 92% of all students were classified as active, and results of a one-way ANOVA revealed males were significantly more active than females, $F(1, 255) = 15.06$, $p = .000$, males ($M = 64.8$, $SD = 31.80$) and females ($M = 52.03$, $SD = 20.71$). Results of a one-way ANOVA showed no significant difference in HRFK scores between the active group ($M = 13.54$, $SD = 3.74$) and the less active group ($M = 12.96$, $SD = 4.70$), $F(1, 278) = .485$, $p > .05$.

Discussion

The aim of this study was to explore the relationship between HRFK and various intensity levels of PA and activity levels of PA across male and female high school students. First, we would like to address the HRFK scores in this study. Even though we used application-oriented questions taken from the Fitness for Life test bank, a valid source (Thompson & Hannon, 2012), we were disappointed with the low HRFK test scores (mean score was 61%), as it seemed to indicate a lack of course effectiveness. Low HRFK scores following a Fitness for Life course were also reported by Thompson and Hannon (2012), who noted a lower average score of 42%, and by Stewart and Mitchell (2003), who reported a mean score of 57% on a cognitive test of fitness concepts. The low HRFK scores in this study reveal a curricular and pedagogical concern about what material is being covered, how these courses are being taught, and the lack of teacher accountability regarding this issue. Females had higher HRFK scores than males, which is in line with the findings of Keating et al. (2009) but differs from the findings of Thompson and Hannon (2012) and Ferkel et al. (2015), who both found no gender difference, though the latter research was with a college population.

The results of the study showed no relationship between HRFK and all intensity levels of PA as designated in this study. This is supported by previous research findings when no intervention was used (Haslem et al., 2016; Keating et al., 2010) but is in contrast to other studies that found significant relationships (Dale & Corbin, 2000; Dale et al., 1998). The latter two studies used an intervention with the researchers helping to create the CPE courses used in their research.

It seems that when HRFK is being taught, content and pedagogy are crucial in helping students make the connection between what they are learning regarding HRFK and their choice of PA intensity levels.

In this study, there was also no difference in HRFK scores between activity levels (active and less active groups), in contrast to other research findings (Dale & Corbin, 2000; Dale et al., 1998; Thompson & Hannon, 2012). Dale and Corbin (2000) and Dale et al. (1998) used an intervention, as previously mentioned. This study and Thompson and Hannon's (2012) study did not involve researcher intervention in how HRFK was taught in the schools, leaving it to the teachers regarding both content and pedagogy, but whereas the current study found no relationship between HRFK scores and activity levels, Thompson and Hannon found significant HRFK score differences between the low active group and moderately active group and between the low active group and high active group. In all, it seems evident that different uncontrolled pedagogical approaches revealed mixed results.

According to Godin's (2011) definition, the majority of the students in this study (92%) were classified as active. In contrast with the children and adolescents in Sallis et. al (1993), who used the LTPAQ and other PA self-reports, the males in this study were more active and the females slightly less active than the students in their study. The population in this study was possibly more active than normal.

Godin (2011) did not use mild PA scores from the LTPAQ for the calculations of his active and inactive categories. For the correlations in this study, the moderate positive correlation between mild PA and moderate PA indicates that engaging in mild PA is related to participation in moderate PA and therefore perhaps should not be ignored. Engaging in mild PA could help motivate students to take their activity up a notch and participate in moderate PA.

The males had higher scores for total PA than the females, which is in line with some research (Taymoori & Lubans, 2008; Trost et al., 2002; U.S. Department of Health and Human Services, 1996), but differs from Thompson and Hannon's (2012) finding of no gender differences. The males also engaged in more healthy PA and strenuous PA than the females in this study.

Conclusion

Overall, the findings in this study expand on existing knowledge concerning the relationship of HRFK and PA. There are still mixed results from research on HRFK. With such an active population in this study, further research is needed to see if HRFK affects less active populations rather than active ones. A common thread in HRFK research is how poorly students do on HRFK tests. There needs to be a focus on optimizing the pedagogy regarding what and how material is taught, and the seeming disconnect between HRFK and reported PA behaviors in CPE students needs to be addressed.

Future studies, including longitudinal studies, could consider pre–post testing of HRFK and PA. A limitation of this study is that some self-reported data about PA may be different than actual student PA.

References

Ayers, S. F. (2004). High school students' physical education conceptual knowledge. *Research Quarterly for Exercise and Sport*, *75*(3), 272–287. https://doi.org/10.1080/02701367.2004.10609160

Corbin, C. B., & Le Masurier, G. C. (2014). *Fitness for life* (6th ed.). Human Kinetics.

Corbin, C. B., & Lindsey, R. (2005). *Fitness for life* (5th ed.). Human Kinetics.

Dale, D., & Corbin, C. B. (2000). Physical activity participation of high school graduates following exposure to conceptual or traditional physical education. *Research Quarterly for Exercise and Sport*, *71*(1), 61–68.

Dale, D., Corbin, C. B., & Cuddihy, T. F. (1998). Can conceptual physical education promote physically active lifestyles? *Pediatric Exercise Science*, *10*(2), 97–109. https://doi.org/10.1123/pes.10.2.97

DiLorenzo, T. M., Stucky-Ropp, R. C., Vander Wal, J. S., & Gotham, H. J. (1998). Determinants of exercise among children. II. A longitudinal analysis. *Preventive Medicine*, *27*(3), 470–477. https://doi.org/10.1006/pmed.1998.0307

Ennis, C. D. (2010). On their own: Preparing students for a lifetime. *Journal of Physical Education, Recreation, & Dance*, *81*(5), 17–22. https://doi.org/10.1080/07303084.2010.10598475

Ferguson, K. J., Yesalis, C. E., Pomrehn, P. R., & Kirkpatrick, M. B. (1989). Attitudes, knowledge, and beliefs as predictors of exercise intent and behavior in schoolchildren. *Journal of School Health*, *59*(3), 112–115. https://doi.org/10.1111/j.1746-1561.1989.tb04675.x

Ferkel, R. C., Stodden, D. F., Judge, L. W., Griffin, K., & Hamman, D. (2015). Relationship between health-related fitness knowledge and physical fitness. *International Journal of Physical Education, Sports, and Health*, *1*(6), 76–82.

Godin, G. (2011). The Godin-Shepard Leisure-Time Physical Activity Questionnaire. *Health & Fitness Journal of Canada*, *4*(1), 18–22.

Godin, G., & Shephard, R. J. (1985). A simple method to assess exercise behavior in the community. *Canadian Journal of Applied Sport Sciences*, *10*(3), 141–146.

Goldfine, B. D., & Nahas, M. V. (1993). Incorporating health-related fitness concepts in secondary school physical education curricula. *Journal of School Health*, *63*(3), 142–146. https://doi.org/10.1111/j.1746-1561.1993.tb06103.x

Green, S. B., & Salkind, N. J. (2005). *Using SPSS for Windows and Macintosh: Analyzing and understanding data*. Pearson/Prentice Hall.

Haslem, L., Wilkinson, C., Prusak, K. A., Christensen, W. C., Pennington, T. (2016). Relationships between health-related fitness knowledge, perceived competence, self-determination, and physical activity behaviors of high school students. *Journal of Teaching in Physical Education*, *35*(1), 27–37. https://doi.org/10.1123/jtpe.2014-0095

Keating, X. D., Castro-Pinero, J., Centeio, E., Harrison, L., Ramirez, T., & Chen, L. (2010). Health-related fitness knowledge and its relation to student physical activity patterns at a large U.S. southern state university. I*CHPERD SD Journal of Research*, *5*(2), 3–9.

Keating, X. D., Chen, L., Guan, J., Harrison, L., & Dauenhauer, B. (2009). Urban minority ninth-grade students' health-related fitness knowledge. *Research Quarterly for Exercise and Sport*, *8*(4), 747–755. https://doi.org/10.1080/02701367.2009.10599616

Pangrazi, R. P. (2010). Chasing unachievable outcomes. *Quest*, *62*(4), 323–333. https://doi.org/10.1080/00336297.2010.10483652

Rogers, H., Morris, T., & Moore, M. (2008). A qualitative study of the achievement goals of recreational exercise participants. *The Qualitative Report*, *13*(4), 706–734.

Sallis, J. F., Buono, M. J., Roby, J. J, Micale, F. G., & Nelson, J. A. (1993). Seven-day recall and other physical activity self-report in children and adolescents. *Medicine and Science in Sports and Exercise*, *25*(1), 99–108. https://doi.org/10.1249/00005768-199301000-00014

Sallis, J. F., McKenzie, T. L., Beets, M. W., Beighle, A., Erwin, H., & Lee, S. (2012). Physical education's role in public health: Steps forward and backward over 20 years and HOPE for the future. *Research Quarterly for Exercise and Sport*, *83*(2), 125–135. https://doi.org/10.1080/02701367.2012.10599842

Stewart, S., & Mitchell, M. (2003). Chapter 4: Instructional variables and student knowledge and conceptions of fitness. *Journal of Teaching in Physical Education*, *22*(5), 533–551. https://doi.org/10.1123/jtpe.22.5.533

Taymoori, P., & Lubans, D. R. (2008). Mediators of behavior change in two tailored physical activity interventions for adolescent girls. *Psychology of Sport and Exercise*, *9*(5), 605–619. https://doi.org/10.1016/j.psychsport.2007.09.001

Thompson, A., & Hannon, J. C. (2012). Health-related fitness knowledge and physical activity of high school students. *Physical Educator*, *69*(1), 71–88.

Trost, S. G., & Loprinzi, P. D. (2008). Exercise – Promoting healthy lifestyles in children and adolescents. *Journal of Clinical Lipidology*, *2*(3), 162–168. https://doi.org/10.1016/j.jacl.2008.03.001

Trost, S. G., Pate, R. R., Sallis, J. F., Freedson, P. S., Taylor, W. C., Dowda, M., & Sirard, J. (2002). Age and gender differences in objectively measured physical activity in youth. *Medicine & Science in Sports & Exercise*, *34*(2), 350–355. https://doi.org/10.1097/00005768-200202000-00025

U.S. Department of Health and Human Services. (1996). *Physical activity and health: A report of the Surgeon General*. Centers for Disease Control and Prevention. https://www.cdc.gov/nccdphp/sgr/pdf/sgrfull.pdf

The Physical Educator Vol. 78 • pp. 384–414 • 2021
https://doi.org/10.18666/TPE-2021-V78-I4-10478

PEDAGOGY

Eye-Opening Experiences: Physical Education Teacher Candidates' Conference Attendance

Xiaoping Fan, Kevin Patton, Luciana Zuest, Craig Buschner, Cathrine Himberg

Abstract

The benefits of professional conference attendance include acquisition of knowledge and practical ideas, establishment of professional networks, exploration of job opportunities, and staying current). Yet, to date, no study has comprehensively examined physical education teacher candidates' (TCs) conference attendance at the national level. Using occupational socialization theory, this study examined physical education TCs' perceptions of their professional conference attendance. Participants included 12 university physical education TCs attending the 2017 Society of Health and Physical Educators (SHAPE) National Convention. Data sources included photo-elicitation interviews, participants' diaries, photographs, and demographic questionnaires. Interview transcripts and diaries were analyzed utilizing open and axial coding. Photographs were analyzed using a reflexive approach combined with methods recognizing the contingency of visual meanings. Results indicated that the majority of formal conference sessions attended by TCs were activity/movement oriented and were selected based upon professor advice and learner interests. Prominent themes

Xiaoping Fan, School of Sport and Exercise Science, University of Northern Colorado. Kevin Patton, Department of Kinesiology, California State University, Chico. Luciana Zuest, Department of Kinesiology, California State University, Chico. Craig Buschner, Department of Kinesiology, California State University, Chico. Cathrine Himberg, Department of Kinesiology, California State University, Chico. Please send author correspondence to xiaoping.fan@unco.edu

of their experience included future focused learning, relationship building, and breaking out of the comfort zone. Overall, conference attendance represents an impactful learning activity, one in which faculty play an important role in shaping TCs' professional growth. Results indicate the importance of supporting TCs' continual learning and development as they transition between phases of teacher socialization.

Teacher education programs and their faculty shoulder the primary responsibility for preparing qualified teachers (Cochran-Smith, 2003). A goal of these programs is the development of teacher candidates (TCs) into effective, reflective, and creative decision makers who adopt a lifelong learning mindset (Armour, 2010). Achievement of this goal requires a committed, qualified, and diverse faculty collaborating to prepare educational professionals for today's schools. The initial physical education teacher education standards (SHAPE America, 2017) suggest TCs participate in activities leading to professional growth and development. Similarly, SHAPE America (2009) indicated that teachers at all levels should continually engage in professional development (PD) initiatives throughout their careers. Professional activities as part of physical education teacher education (PETE) programs can improve the impact of teacher education on TCs' learning and provide opportunities to help TCs learn new information and meet more people to prepare for a career in teaching (Hickson, 2006; Kampla et al., 2008; Stroot, 2001). Therefore, it is a responsibility of teacher education programs to instill TCs with an appreciation of the benefits of lifelong learning, which is a career-long process, and help them to develop the knowledge, skills, and dispositions to be willing and able to effect change in an increasingly diverse and technologically integrated educational environment.

Effective Professional Development

Professional development (PD) refers to a variety of educational experiences designed to improve teachers' practice and students' learning outcomes (Darling-Hammond & McLaughlin, 2011). Throughout their careers, teachers experience a wide variety of PD activities with the potential to result in professional learning such as new knowledge and skills, thus improving practice and contributing to their growth as professionals. Far too often, much of the PD

offered to teachers is passive rather than active. The most commonly reported formats include school-based in-service days, structured workshops, university coursework, engagement in professional learning communities, and conference attendance (Parker & Patton, 2017).

Like the socialization process, PD is continuously shaping teachers' decisions, actions, and orientations across the teaching career (Richards et al., 2014). PD research confirms that one-size-fits-all workshops intended to meet the diverse learning needs of practicing teachers are inadequate (Darling-Hammond et al., 2009). Scholars have suggested that effective PD, aimed at changing pedagogical practices and resulting in student achievement gains, is dramatically different. Parker and Patton (2017) described effective PD to be social and active and involve collaborative learning. They noted, however, that there have been few major changes over the past three decades in the way that much physical education PD is conducted (Parker & Patton, 2017). Therefore, there is a need to work toward new and alternative PD formats throughout all phases of a teacher's careers from teacher education programs to late career.

As part of their preparation, TCs are frequently exposed to PD opportunities and are encouraged to engage in continued professional growth. Such activities often stressed in teacher education programs include joining professional organizations and attending conferences (Graber, 1996; SHAPE America, 2017). Anecdotal benefits of professional conference attendance include acquiring new knowledge about strategies and practical teaching ideas, discussing best practices in teaching, and finding resources for current or future physical education programs (Darden et al., 2005; Stroot, 2001). In addition, studies have identified professional conferences as a major vehicle for keeping teachers updated and current (Napper-Owen et al., 2008), establishing professional networks, and gaining exposure to job opportunities (Kampla et al., 2008; Stroot, 2001).

Despite these recommendations, few physical education teachers are involved in professional activities such as attending conferences (Castelli & Williams, 2007; Sears et al., 2014). In one of the few studies examining conference attendance, Davis-Brezette (2009, 2010) investigated TCs' motives for, benefits of, barriers to, and overall impact of attending and presenting at a state conference. Results

indicated that participants were eager to learn new teaching activities during the conference and gained new awareness about becoming a professional. This study relied primarily on survey data, focusing largely on participants' overall satisfaction.

Theoretical Framework

Occupational socialization theory served as the theoretical framework for this study. Lawson (1986) defined occupational socialization as "all kinds of socialization that initially influence persons to enter the field of physical education and that later are responsible for their perceptions and actions as teacher educators and teachers" (p. 107). Teacher socialization is recognized as a nonlinear process, generally represented along the three phases of acculturation, professional socialization, and organizational socialization (Richards et al., 2014). This study focused on the professional socialization phase (preservice) as described by occupational socialization theory, or the process through which individuals learn to be physical educators through PETE programs. Professional socialization begins when a TC enters a PETE program designed to prepare effective teachers, typically in a college or university (Ayers & Housner, 2008; Lawson, 1983a, 1983b, 1986). During this phase, prospective teachers grapple with PETE disciplinary knowledge, curricula, and student learning. Further, TCs develop the knowledge, skill, and dispositions of the profession deemed important by the faculty through a combination of learning experiences (Lawson, 1983b). For example, TCs typically complete methods and foundational courses within the department, take general education courses outside the department, and participate in early field experience and student teaching in local schools and classrooms (Graber et al., 2017). It has been advocated that PETE programs focus on supporting TCs to question and challenge initial assumptions of what it means to be a physical educator (Richards et al., 2013). Despite well-intentioned faculty and thoughtfully designed PETE programs, some scholars have suggested their limited impact on professional socialization, noting that teacher education courses often do not effectively alter the beliefs and dispositions that recruits acquire during acculturation (Zeichner & Gore, 1990).

Other scholars have argued that, when done in a proactive manner, programs have successfully helped TCs to reformulate their subjective theories (Graber et al., 2017). Common features of these

programs include a shared technical culture among faculty about what candidates should learn (Curtner-Smith, 2001); integrated and reinforced essential features of teaching across the program (Graber et al., 2017); and multiple, purposeful, supervised field experiences (Richards et al., 2014).

Likewise, physical education teacher educators investment in their own professional learning and development, and the successful portrayal of that to TCs through innovative pedagogies, role modeling, and mentoring, has also been identified as an area with potential to positively affect TCs' views of learning (MacPhail et al., 2014). This investment by teacher educators holds the potential to instill the appreciation and necessity for lifelong learning as they move into teaching in schools, and perhaps combat the negative aspects of occupational socialization. Because PD does not end with initial university training, the adoption of a lifelong learning mindset and subsequent behaviors is a critical attribute that must be impressed upon TCs during the socialization process (Armour, 2010).

Socialization and Teacher Professional Learning and Development

K. Patton et al. (2015) proposed that professional socialization be considered from a new perspective, one that is no longer viewed as a reactive and linear process, but rather a dynamic, ever changing process that illustrates the changing nature of professional socialization over time. In alignment with this perspective, Kearney (2014) presented a conceptual framework exemplifying how beginning teachers advance through the induction practices of an organization and illustrated how socialization may aid in, rather than detract from, novices' progression. This work, founded on Van Maanen and Schein's (1979) framework for organizational socialization, is based on the premise that teacher induction is "the primary phase in a continuum of professional development leading to the teacher's full integration into a professional community of practice and continuing professional learning throughout their career" (Kearney, 2014, p. 5). As such, learning is viewed as central to the socialization process.

However, limited research has identified what constitutes PD opportunities within PETE programs with the potential to instill in TCs an appreciation for experiences that will contribute to lifelong learning. Proponents of a focus on lifelong learning frequently

advocate conference attendance as one PD strategy to maximize the impact of teacher education programs (Graber, 1996). The ways in which conference attendance can influence TCs' professional learning and development are important and yet needs investigation. Additionally, the role of teacher educators in TCs' adoption of a lifelong learning disposition demands attention. Therefore, the purpose of this study was to examine physical education TCs' perceptions of their professional conference attendance. Three research questions were explored: (a) What were TCs' motives and expectations for attending a national conference? (b) What formal and informal activity and event choices did TCs make and why? (c) What was the perceived impact of conference attendance on TCs' learning and growth as future professionals? Findings hold the potential to positively inform PETE programs and shape PD opportunities for TCs.

Method

Participants

Participants included 12 physical education TCs (9 females, 3 males) attending the 2017 SHAPE America National Convention. Participants had an average age of 21.6 years (range 20–26), representing two PETE programs (one in the Western United States and one in the Northeastern United States). Their previous conference attendance included state and national conferences. The average number of conferences attended was 1.9 (range 0–6). Previously attended conferences were primarily at the state level and physical education focused. Conference attendance was highly encouraged for one program, while attendance (either state or national) was a degree requirement for the other program.

We used a combination of convenience and purposive sampling (M. Patton, 2002) to recruit participants from the two PETE programs with a history of encouraging and facilitating TCs to attend the SHAPE America conferences. We contacted PETE faculty at those institutions and asked them to provide the contact information of TCs scheduled to attend the conference. Once potential participants were identified, we contacted them via email, informing them of the study and asking if they would participate. Procedures for obtaining appropriate informed consent were approved by institutional review board guidelines.

Data Collection

A combination of methods were utilized to capture TCs' perceptions of their attendance at the 2017 SHAPE America National Convention. These data collection techniques included (a) participant diaries of formal and informal activities and events, (b) demographic questionnaire, (c) TCs' photographs of their meaningful events and experiences using a photovoice approach, and (d) formal semistructured photo-elicitation interviews.

Participant Diaries

First, to explain and clarify study protocols, Xiaoping Fan met with the participants at the convention center on the first day of the conference. During the meeting, diaries were distributed and participants were asked to record formal sessions, informal events (conversations, meals, sightseeing), and write a brief reflection on their learning throughout the conference. To supplement the diaries, Fan asked participants to take a minimum of five pictures each day of meaningful events and experiences with their phones or cameras. During the conference, Fan sent two messages per day (morning and late afternoon) to all participants, prompting them to record in their diaries as well as to take the photographs.

Demographic Questionnaire

Participants also completed a demographic questionnaire and informed consent at this meeting. The demographic questionnaire was to gain additional context about the participants, including gender, age, university, major, classification, previous conference attendance experience, and future career goal.

Photographs

During the conference, participants took digital photographs of personally meaningful events, representations, and activities (Harper, 2002). After the conference, TCs were asked to submit to the researchers their five most meaningful photographs representing (a) learning, (b) a formal session, (c) an informal event, (d) people they met or interacted with, and (e) a place they visited. This visual ethnography approach (Pink, 2007) generated different and complementary information because of its ability to gather important evidence of TCs' personally meaningful events when and where it happened.

Photo-Elicitation Interviews

Using Wang and Burris' (1997) three-step approach of selecting, contextualizing, and codifying, TCs then analyzed their photographs. Within 2 weeks of the conference, Fan conducted formal semistructured photo-elicitation interviews with TCs focusing on their motives for conference attendance, their activity choices, and the perceived impact of conference attendance on their professional learning and growth. By prompting and shaping latent memory and reducing areas of misunderstanding, teachers' photographs served as a means of communication between Fan and the participants (Harper, 2002). Photographs provided an opportunity to evoke longer and more comprehensive accounts of TCs' experience. Through participant images, we sought to hear and understand how TCs made meaning of their conference attendance. Interviews lasted between 45 and 60 min and were conducted via FaceTime.

Data Analysis

First, analysis of attendance recorded in participants' diaries consisted of calculating frequencies and percentages for both formal sessions and informal events. Second, TCs' qualitative responses to individual interview questions and their diaries were analyzed with open and axial coding (Corbin & Strauss, 2008). During the open and axial coding phase, all interview transcripts were read individually several times, with notations made in the margins. From each transcript, significant phrases or sentences that pertained directly to perceptions of conference attendance were identified. Also during this phase, analytic memos (Creswell, 2007) were written for each data source, which allowed for documentation of and enriched the interpretive process. Analytic memos consisted of questions, comments, and ideas about emerging categories. Next, categories were conceptualized and defined in terms of their properties and dimensions. Photographs were analyzed through a reflexive approach combined with methods recognizing the contingency of visual meanings (Pink, 2007). Analysis began with identification of all features (e.g., people, places, events) and examination of TCs' explanations of why they took the photographs. Then the identified features and quotes were coded and classified into categories according to similar themes.

Trustworthiness

Trustworthiness was established through three techniques: (a) triangulation, (b) a researcher journal, and (c) an audit trail (Merriam, 2009). First, multiple investigators and multiple data sources were used in the confirmation of the findings. Data were triangulated for analytical purposes across three data sources (interviews, diaries, and photographs). Investigator triangulation occurred as Fan and two experienced qualitative researchers, Kevin Patton and Luciana Zuest, engaged in multiple debrief meetings throughout the data analysis process. Second, Fan kept a researcher journal to document personal reflections, methodological decisions, questions raised, theoretical propositions, and evolving perceptions of the study, acknowledging the researchers' beliefs, values, assumptions, and positions throughout the research process. Finally, an audit trail was maintained, allowing for a transparent description of the research steps taken from the start of a research project to the development and reporting of findings (M. Patton, 2002).

Results

Results are presented in two main sections. First, conference session attendance is described in terms of the types and frequency of conference sessions chosen by TCs. Next, TCs' perceptions of their conference attendance are presented.

Conference Session Attendance

Formal Sessions

Analysis of participants' diaries indicated that collectively, TCs attended 109 formal conference sessions (see Table 1). The most frequently reported type of formal sessions were categorized as physical education curriculum and instruction (n = 44). Examples included yoga, cricket, and Irish dance. This category was accountable for the highest percentage of formal sessions attended (40.4%). Other types of sessions selected by participants included those focused on physical activity with Comprehensive School Physical Activity Program (n = 14), conference-sponsored sessions, general sessions (n = 9), and adapted physical education (n = 8).

Table 1
Formal Sessions Participants Attended (N = 109)

Category	Example	Frequency	% of total formal sessions
Physical Education			
Curriculum and instruction	Yoga, Irish step dancing	44	40.4
Adapted physical education	APE TOY playbook	8	7.3
Technology	Fitness assessment	4	3.7
Professional preparation	Effective PE teacher	2	1.8
Subtotal		58	53.2
Physical Activity			
CSPAP	Physical activity leader training	14	13.8
Adapted physical activity	Archery and autism	2	1.8
Dance	Fun dances from around the world	1	.9
Subtotal		17	15.6
School Health Education			
Professional preparation	The edTPA	4	3.7
Curriculum and instruction	Assessment in the health education classroom	2	1.8
Subtotal		6	5.5

Table 1 (cont.)

Category	Example	Frequency	% of total formal sessions
Conference-Sponsored			
General sessions	Wednesday general session	9	8.3
Exhibition	Equipment and products	4	3.7
Student orientation	Student orientation	4	3.7
The award ceremony	The year ceremony	1	1.9
Subtotal		18	16.5
Others			
Presentation	Student research work-in-progress poster	6	5.5
Leadership development	Transitioning from student to teacher	2	1.8
Advocacy	Success stories from advocacy champions	1	1.9
Coaching	Soccer	1	1.9
Subtotal		10	9.2

Informal Events

Teacher candidates recorded a total of 55 informal events (see Table 2), which included sightseeing (n =17), meeting and talking with people (n =11), and having meals with professors and peers (n = 11). Sightseeing accounted for the highest percentage of informal events (30.9%). For examples of formal and informal event diary entries, see Figure 1.

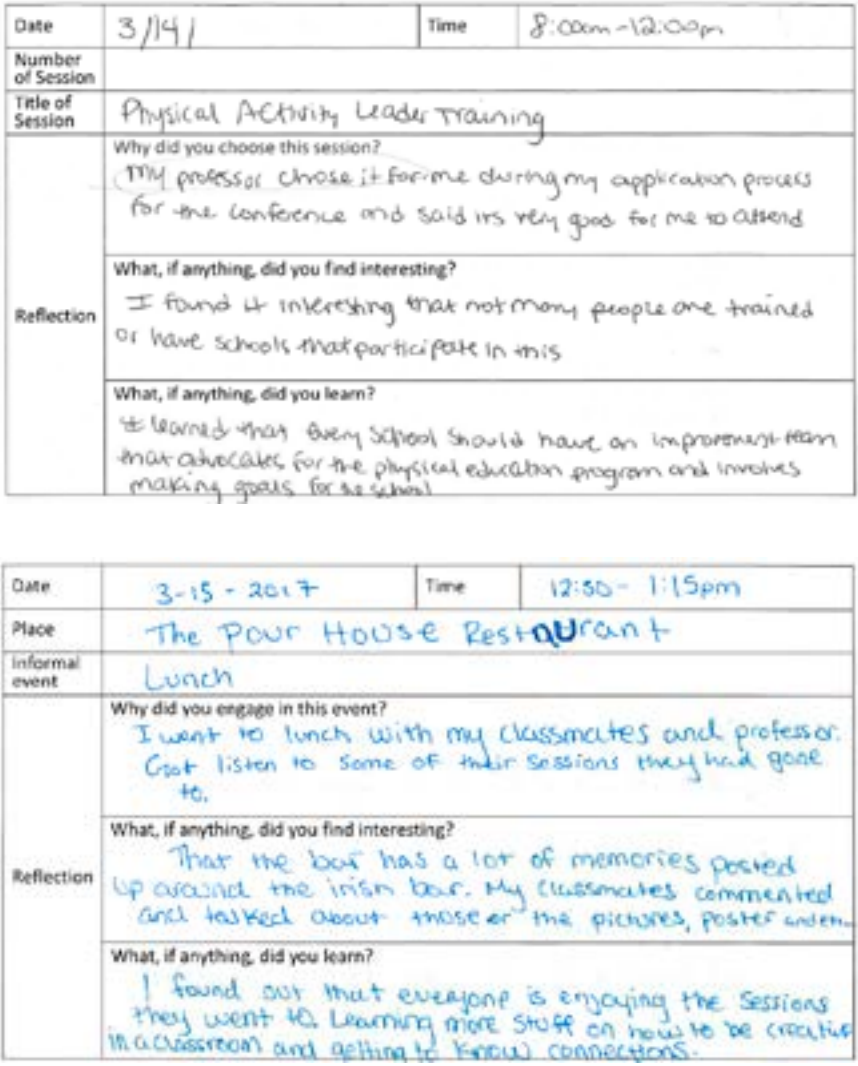
Table 2
Informal Events Participants Attended (N = 55)

Category	Example	Frequency	% of total formal sessions
Sightseeing	Fenway Park, Harvard	17	30.9
Meeting and talking to people	Physical education teachers	11	20
Having meals with professors and peers	Having dinner with peers	11	20
Attending sporting events	NBA basketball game	10	18.2
Attending university alumni social	University social	6	10.9

Teacher Candidates' Perceptions of Conference Attendance

Analysis of qualitative data resulted in three themes describing TCs' perceptions of their attendance: future focused learning, relationship building, and breaking out of the comfort zone.

Figure 1
Diary Entry of Formal (Andrea) and Informal (Audrey) Activities and Events



Date	3/14/	Time	8:00am-12:00pm
Number of Session			
Title of Session	Physical Activity Leader Training		
Reflection	Why did you choose this session? My professor chose it for me during my application process for the conference and said its very good for me to attend		
	What, if anything, did you find interesting? I found it interesting that not many people are trained or have schools that participate in this		
	What, if anything, did you learn? I learned that Every School should have an improvement team that advocates for the physical education program and involves making goals for the school		

Date	3-15-2017	Time	12:50- 1:15pm
Place	The Pour House Restaurant		
Informal event	Lunch		
Reflection	Why did you engage in this event? I went to lunch with my classmates and professor. Got listen to some of their sessions they had gone to.		
	What, if anything, did you find interesting? That the bar has a lot of memories posted up around the irish bar. My classmates commented and talked about those or the pictures, poster and...		
	What, if anything, did you learn? I found out that everyone is enjoying the sessions they went to. Learning more stuff on how to be creative in a classroom and getting to know connections.		

Future Focused Learning

Participants were motivated to seek new information that would help them become better teachers. Specifically, TCs wanted to expand their knowledge base and noted that they wished to learn about unfamiliar topics that they did not learn about in their PETE programs. For example, Chris shared,

> I just want to learn about new stuff. I was wishing to learn about different sports because kids get bored with basic stuff…Learning new material, new ways to use technology. I was just curious about knowledge, just the new ways people teach. My intentions were to learn new content and think about ways to implement it in my classroom when I teach.

Participants frequently sought novel content and sessions featuring hands-on learning. This affinity to select physically active sessions was corroborated by their diary entries recording which sessions they attended and why. For example, Chris shared:

> I wanted to go to the seminars [sessions], but I also want to go active [sessions] where I'm actually doing something, like the Irish step dancing. I also wanted to be active and be engaged in the learning process. I feel like if you do what the students will do, it's easier for you to teach. Plus, you also know what the students are going for.

In addition to seeking active sessions, TCs sought sessions that engaged their sense of curiosity to learn new content, sports, technology, and activities. For example, Zoe expressed his excitement:

> This was just incredible to me. There were all these people around these exercise balls and drumsticks, and no one really told us what to do. The presenter just came in and started drumming on an exercise ball, and we all followed, and she went about half an hour into the session without saying a word, and we got a lot of physical activity in different rhythms and beats.

See Figure 2. Similarly, Michelle shared,

> For some of the stuff I didn't know, like Irish step dancing, seminars about optimism, and cricket, I wanted to get a broad idea on how to teach those, or how to understand them, or how to play the game…I wanted to learn how to convey that information to my students, to my future students.

Figure 2
Activity Session in Progress (Zoe)

In addition, some TCs chose the sessions with the topics not specifically addressed or not addressed in depth within their PETE program. As such, they chose sessions, often prompted by their professors, to fill perceived gaps in their knowledge. Maria reported,

> In the physical education [teacher education] program, we don't learn much about coaching because coaching is a minor, and so I definitely want to attend that...In the physical education [teacher education] program, we do have health classes, but it's more physical education oriented and so that's why I went to more health [sessions], so I can get a lot more information about how to teach health.

Exhibit hall attendance supported participants in learning information that could be incorporated into their future teaching. Amy's photo (see Figure 3) indicated she was introduced to a variety of equipment sizes and uses:

> That specific [picture] showed you all sorts of different balls that they make. And it was cool because you're just seeing like one size ball versus they had like 10 on the table…I could use this stuff for future, [I] tried to compare that to other equipment companies.

Figure 3
Variety of Equipment and Uses (Amy)

Linda also indicated that she gained new assessment ideas:

> Things that are more effective for assessing women students and bringing fitness into the gym with no equipment…also learning another sport is different and it's something that you can modify in a gym to teach at a middle school or high school students…I took a lot away from the ideas behind physical education.

Relationship Building: Creating a Sense of Community

Engagement in conference preparation with peers and professors supported TCs getting to know one another and initiating meaningful conversations, resulting in confidence building. For example, Anna felt she "learned much more about one another, and opened up on deeper levels besides just having that professor–student relationship, it was more of a friend-to-friend relationship." Further, they noted that making connections and developing relationships was a significant outcome of their attendance.

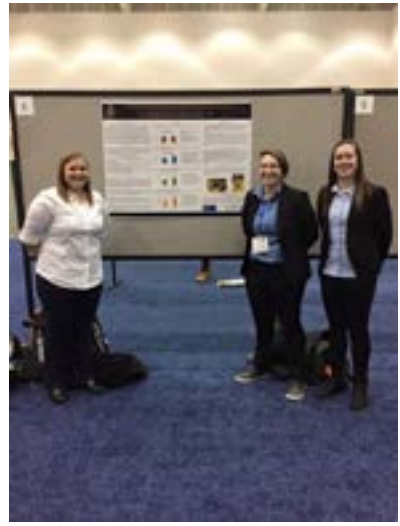
For one PETE program, conference attendance (either state or national) was a degree requirement. While encouraged (but not required) to attend, the TCs in the other program in this study were motivated by the opportunity to present with their professor as part of a research team. Zoe shared, "This was the picture of me presenting my rolling station at the session. So, basically I was able to teach other teachers about the program [underhand bowling for preschool]" (see Figure 4). This opportunity to prepare and present together provided a bonding experience. Sharing her thoughts about presenting a research poster at the conference (see Figure 5), Lauren explained,

> It was just an awesome experience to show what we've been working on as a group, and people coming over to us to ask good questions. They wanted to know more about it. And this was definitely a positive impact. It was also just cool to meet people and presenting is not in my comfort zone.

Conference activities, such as presenting with professors, allowed TCs to get to know their professors and peers, resulting in the development of a sense of community. Amy shared about her experiences

Figure 4
Conference Presentation (Zoe)

Figure 5
Research Poster Sessions With Co-Presenters (Linda)



with others, including touring Harvard University with her peers and professors. She also indicated that connecting with others made conference attendance meaningful: "It was nice connecting with our professors, or with just the girls. It was really nice because we got to know each other a lot better" (see Figure 6). Because of the trust and relationships developed, PETE faculty played an important role not only by encouraging TCs to attend the conference, but also in influencing which sessions TCs selected. For example, Chris shared, "all of our teachers were talking about it this year…So it was mainly from my teachers, but also from a couple of students, other peers." Maria added,

> Our professors had gone to conferences all over the country, and they were so supportive in going to this [conference]. There were even people from last year who went to the conference in Minnesota who encouraged us to go. They would tell us about all the events they attended, and how much fun it was, and how much they gained, and the people that they met and the connections they made.

Figure 6
Together With Classmates (Amy)

Advice from professors was the most frequently cited stimulus for session selection. They provided general advice and encouraged interactions with other participants. Raven indicated,

> [The professor] told us to go to sessions that weren't necessarily our strengths, things we wish to work on, and she told us to basically go to those instead of going to all the sessions you were confident in or were more interested in, go to ones that you weren't sure about.

Andrea shared advice that she received from her professor about meeting others:

> One professor was just saying to, like, make the most of it, see as much as you can, meet as many people as you can, go around and try to go to sessions that aren't necessarily what you would pick out right away but are the things you could work on.

In addition to strengthening bonds with peers and professors, participants also met and connected with people at the conference including students, teachers, and professors. These other people shared their experiences and information about teaching, research, job opportunities, and graduate school. Edward shared that he got to meet people from the United States and internationally:

> I got to meet people from the East Coast; they shared their experiences and ways to get students motivated, so I can use that in my future teaching…I talked to some of the students, I talked to a couple of teachers…I got to meet a few people from Ireland and a lot of people from different states.

Interactions with others during the conference also helped to confirm their career choice. Andrea shared her excitement of meeting new people and information that would help her in her future teaching: "I got excitement into entering the field because of just how the teachers there and professors there. I was surrounded by how invested they were in learning new things, how excited they got off of it." Karen indicated a shared motivation to become a better physical educator:

> We were all there for the same reasons: to become more knowledgeable, creating networks, sharing ideas, learning new things and new activities we can teach later …[I] saw hundreds of teachers there keeping up with their professional development, and gaining new ideas, and hoping to find something that they can add or incorporate into their classroom. So, when I become a future professional I need to do the same.

Participants also received the contact information from teachers so they could request teaching resources, ask questions about teaching, and inquire about job prospects. Cathy shared,

> I got [the teachers'] school email. So they told me if I had questions, wanted to go over ideas with them and that I could contact them, which is awesome…Sometimes it's nice to have those contacts to say this is what I'm thinking, do you have any resources for it?

Raven added these contacts could result in future employment opportunities after graduation:

> I got to meet people who were like "oh, here's a business card, my school is hiring next year," or even people talking about my different graduate schools. Actually, I met a guy in a session who said that he used to be a professor at the university that I'm looking at [for graduate school]. It was just accidental, but that sounds like an awesome opportunity. So it was great just networking and seeing the different opportunities out there.

Several participants shared that their previous positive conference experience was impactful, identifying making connections with others and relationship building as a motivating factor in their attendance. Chris reported the benefits of attending a state conference:

> I feel like at state conference, you can create connections better in your state because we talked to one of the top people in Seattle who are hiring, and also teachers just from local districts very close to home.

TCs also noted the value in making connections, gaining different teaching ideas, and confirming that the content in their own PETE programs was current and relevant. The positive previous conference experience motivated TCs to attend this national conference: "I've gone to the state conferences, I've been to the last two years, and I really like those. So I thought that this would be just another cool experience to be able to meet more people" (Linda).

Breaking Out of the Comfort Zone

Participants indicated that conference attendance helped to break them out of their comfort zones, providing new perspectives on career and lifelong learning. Andrea shared, "[The conference] definitely opened my eyes to different perspectives, and how to kind of pull apart certain things and now I might just think about them differently." Chris noted, "It was a very good eye-opening experience…I would do it again in a heartbeat. It was an amazing conference and there's a lot to learn."

In addition to providing new perspectives on teaching, the conference supported TCs transition from student to teacher. For example, Karen, in her diary entry, shared,

> [I chose] transition from students to teachers [formal session] because in the fall I'll be doing my student teaching. So I really wanted to gain more knowledge on how I can actually transition and be a professional other than a student.

In providing other students advice about how to navigate a conference experience, Anna stated,

> Try to step out of your comfort zone. We are here for the right reasons. We are here to expand our mind, expand our experiences, learn from other people. Take it seriously. Try to get sessions because we do not know what we could walk away with, and try to avoid staying in that comfort zone, like do not to be too shy, like everyone is accepting or everyone is learning.

Similarly, Lauren shared how her attendance and interaction with others provided a different perspective on the teaching perspective,

noting that being comfortable with uncertainty is a reality of teaching:

> I think going to conferences is so beneficial because you get so many different perspectives and you get to interact and network with so many different people…and again being pushed outside my comfort zone, like I feel like that's something that happens in teaching a lot, so like getting used to it now, I guess is just going to pay off eventually, like help me in the future.

Finally, participants appreciated the role of trying something new in pursuing lifelong learning. As Anna stated, "There was never enough to learn. So there will always be something new out there for me to bring into my own classroom or gymnasium one day." Overall, the experience served, often, to push TCs out of their comfort zones, allowing them to examine the transition from student to teacher and motivating them to work hard and remain engaged professionally:

> [This conference] definitely has taught me a lot and has made me want to keep motivated this semester to work hard because I can see the bigger picture now, like why I am going to school, and because sometimes I just want to quit, but now it helps me see the bigger picture of what can come from and what I'm doing. (Michelle)

Discussion

While physical education scholars have argued that professional conference attendance may affect TCs' continual growth and development, limited PETE research has been conducted in this area (Richards et al., 2014). The findings in this study indicate that conference attendance plays an influential role in TCs' PD. The TCs viewed the conference as a positive experience that resulted in the attainment of new content, relevant ideas, and relationship building. Participants also perceived that their experiences, both formal and informal, resulted in new career perspectives and an appreciation of lifelong learning. Several participants shared the sentiment of having "eye-opening experiences," indicating that their experiences pushed

them out of their comfort zone and thus increased their motivation to work hard to prepare for a career in physical education teaching.

In line with occupational socialization theory, participation in professional activities and organizations such as conference attendance may complement and support quality teacher education programming. Conference attendance, as a component of a quality teacher education program (either encouraged or required), introduced TCs to learning opportunities impossible in PETE programs alone. It also supplemented perceived voids in PETE programming by allowing TCs to seek content not formally addressed in their coursework. It has been reported that PETE programs sometimes have limited impact on TCs' beliefs and dispositions during acculturation (Capel et al., 2011; McCullick et al., 2012; Srean & Curtner-Smith, 2009). This study, however, provides some initial evidence that these TCs began to change the ways they viewed themselves as professionals. For some TCs, conference attendance helped them think about their career as future teachers, positively shaping their transition from students to physical educators.

As TCs move beyond the acculturation and professional socialization phases into organizational socialization of their teaching careers, continuing to learn and develop as individuals and professionals is crucial. If teachers are to be successful, the transition between and among each phase of socialization needs to be planned in a seamless fashion (Parker & Patton, 2017). When any person adjusts to "novel circumstances" that come when beginning teaching, a change in jobs, taking on a second role, and receiving tenure, there is likely to be some surprise or reality shock involved (Van Maanen & Schein, 1979). These surprises may be described as the realities or circumstances of teaching—all of which require some type of adjustment.

Over the past three decades, scholars have called for a revision of teacher education curricula in physical education to better prepare recruits for the realities of working in schools (Lawson, 1986; Richards et al., 2013). Teacher candidates in this study had opportunities to talk to teachers and learn about their experiences in school as well as the problems they face daily. Such opportunities helped TCs see a more realistic picture of being a physical education teacher. Participants shared that their interactions with teachers

exposed them to the difficulties and milestones they may experience as professionals and the best practices teachers had utilized when faced with challenges within the public school system. While difficult to quantify, these opportunities to interact with and ask teachers questions helped TCs to think about themselves and the profession differently.

Most often in physical education, teachers, especially beginning teachers, find the reality of school does not match what they were taught in their teacher education program (Blankenship & Coleman, 2009). Within physical education, two of the most prominent circumstances of teaching are isolation and marginalization (Stroot & Ko, 2006). In one sense, physical education teachers are physically isolated, with the gymnasium most often being on the perimeter of the school, and/or in elementary schools they are often the only physical education teacher. These circumstances often result in lack of conversations with other teachers and physical education teachers' opinions not being sought. In another sense, physical education teachers are often intellectually isolated due to conflicting views of physical education's place in schools, which results in feelings of marginalization and is often epitomized by the multitude of noninstructional functions and duties assigned to them (Stroot & Ko, 2006). In their study of inservice physical education teachers, Richards et al. (2018) reported that enhanced personal accomplishment and resilience helped to foster perceptions of mattering (i.e., feeling a meaningful part of the school curriculum), reducing physical educators' perceived isolation and marginalization. Within the results of this study, TCs viewed their attendance, especially presenting research with their professors, as a personal and professional accomplishment. Their experience also affirmed that the content in their PETE program was important, relevant, and contemporary. Further, participants described engaging with fellow students and professors as well as interacting with other teachers as a valuable experience. They indicated conferences as a venue for new teachers to be accepted, have a voice, ask questions, and be supported. With such support, young teachers may be more likely to weather the effects of washout (Blankenship & Coleman, 2009).

Current professional guidelines indicate that TCs should pursue PD opportunities that support collaboration in schools and/

or professional organizations and should continually seeking new information to stay current and improve their professional growth and professionalism (SHAPE America, 2009, 2017). Effective PD advocates have described teacher learning as "interactive and social, based in discourse and community practice" (Desimone, 2011, pp. 68–69). This brand of PD highlights formal and informal learning within communities (Parker & Patton, 2017). For the participants in this study, conference attendance represented several of these characteristics. They learned new content and gained ideas to improve their learning and professional growth and the sessions they most frequently selected to attend were active in nature. Further, TCs identified relationship building with peers and professors and conversations with current teachers as the most memorable and impactful conference experiences.

A unique finding of this study was the pivotal role PETE faculty play in influencing conference attendance and their critical role in preparing TCs to maximize opportunities to grow professionally. Teacher candidates from one university were provided opportunities to formally co-present research findings with faculty. In both programs, PETE faculty demonstrated their commitment to helping TCs get the most out of conference attendance by focusing on engagement in meaningful conversations and learning important content knowledge. For TCs, the role of faculty was prominent; faculty not only encouraged them to attend but also provided them with guidance about conference attendance either formally or informally. Importantly, faculty served as role models by demonstrating their dedication to lifelong learning. Therefore, teacher preparation programs should thoughtfully support TCs in acquiring the essential knowledge, skills, and dispositions that contribute to the development of professionals who accept a lifelong responsibility for continued learning. As such, teacher educators' investment in their own professional learning and development, and the successful portrayal of that to TCs, is crucial and holds the potential to positively affect TCs' view of learning (MacPhail et al., 2014).

Conclusion

Results of this study indicate that conference attendance is a meaningful activity for TCs' learning and professional growth. TCs shared that they learned new content, built relationships, and gained

more awareness of becoming a professional. Interacting with current teachers assisted them in examining the realities of teaching physical education and working in schools. Results in this study begin to scratch the surface in terms of examining the impact of conference attendance. For example, utilizing different and varied methodologies could bring additional insight into the complex process of teacher candidate professional learning and development. Future research could also document actual impact of conference attendance on TCs' positive socialization, beliefs, and teaching performance. Other studies may examine the impact of conference attendance on in-service teachers' PD and further investigate the role of PETE faculty in TCs' learning and professional growth. A deeper understanding of the impact of conference attendance and other similarly impactful learning experiences may result in more effective ways of preparing TCs. Results of this study highlight the influence of continual learning and development on TCs as they move beyond the acculturation and professional socialization phases into organizational socialization in their teaching careers. They also capture the composition of PETE programs that succeed in the socialization of TCs (Richards & Gaudreault, 2017).

References

Armour, K. M. (2010). The physical education profession and its professional responsibility... or... why "12 weeks paid holiday" will never be enough. *Physical Education and Sport Pedagogy*, *15*(1), 1–13. https://doi.org/10.1080/17408980903413479

Ayers, S. F., & Housner, L. D. (2008). A descriptive analysis of undergraduate PETE programs. *Journal of Teaching in Physical Educatio*n, *27*(1), 51–67. https://doi.org/10.1123/jtpe.27.1.51

Blankenship, B. T., & Coleman, M. M. (2009). An examination of "wash out" and workplace conditions of beginning physical education teachers. *Physical Educator*, *66*(2), 97–111.

Capel, S., Hayes, S., Katene, W., & Velija, P. (2011). The interaction of factors which influence secondary student physical education teachers' knowledge and development as teachers. *European Physical Education Review*, *17*(2), 183–201. https://doi.org/10.1177/1356336X11413184

Castelli, D., & Williams, L. (2007). Health-related fitness and physical education teachers' content knowledge. *Journal of Teaching in Physical Education*, *26*(3), 3–19. https://doi.org/10.1123/jtpe.26.1.3

Cochran-Smith, M. (2003). The multiple meanings of multicultural teacher education: A conceptual framework. *Teacher Education Quarterly*, *30*(2), 7–26.

Corbin, J., & Strauss, A. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (3rd ed.). Sage. https://doi.org/10.4135/9781452230153

Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches* (2nd ed.). Sage.

Curtner-Smith, M. (2001). The occupational socialization of a first-year physical education teacher with a teaching orientation. *Sport, Education, and Society*, *6*(1), 81–105.

Darden, G., Nelson, S., & Parsons, R. (2005). Attending the AAHPERD national convention: A guide for faculty advisors. *Journal of Physical Education, Recreation & Dance*, *76*(2), 19. https://doi.org/10.1080/07303084.2005.10607330

Darling-Hammond, L., & McLaughlin, M. (2011). Policies that support professional development in the era of reform. *Phi Delta Kappan*, *92*(6), 81–92. https://doi.org/10.1177/003172171109200622

Darling-Hammond, L., Wei, R., Andree, A., Richardson, N., & Orphanos, S. (2009). *Professional learning in the learning profession: A status report on teacher development in the United States and abroad*. National Staff Development Council.

Davis-Brezette, J. (2009). Undergraduate physical education major's motives for attending and presenting at an IAHPERD conference. *Indiana AHPERD Journal*, *38*(3), 11–14.

Davis-Brezette, J. (2010). Benefits, barriers, and overall impact of attending/presenting at an IAHPERD conference for undergraduate physical education majors. *Indiana AHPERD Journal*, *39*(1), 23–26.

Desimone, L. M. (2011). A primer on effective professional development. *Phi Delta Kappan*, *92*(6), 68–71. https://doi.org/10.1177/003172171109200616

Graber, K. (1996). Influencing student beliefs: The design of a "high impact" teacher education program. *Teaching and Teacher Education*, *12*(5), 451–466. https://doi.org/10.1016/0742-051X(95)00059-S

Graber, K. C., Killian, C. M., & Woods, A. M. (2017). Professional socialization, teacher education programs, and dialectics. In K. A. R. Richards & K. L. Gaudreault (Eds.), *Teacher socialization in physical education: New perspectives* (pp. 63–78). Routledge.

Harper, D. (2002). Talking about pictures: A case for photo elicitation. *Visual Studies*, *17*(1), 13–26. https://doi.org/10.1080/14725860220137345

Hickson, M. (2006). Raising the question #4: Why bother attending conferences? *Communication Education*, *55*(4), 464–468. https://doi.org/10.1080/03634520600917632

Kampla, J., Bennet, S., & Marcum, P. (2008). How do we get our majors more involved in IAHPERD? *Indiana AHPERD Journal*, *37*(2), 27–31.

Kearney, S. P. (2014). Understanding beginning teacher induction: A contextualized examination of best practice. *Cogent Education*, *1*(1), 1–15. https://doi.org/10.1080/2331186X.2014.967477

Lawson, H. A. (1983a). Toward a model of teacher socialization in physical education: Entry into schools, teachers' role orientations, and longevity in teaching. *Journal of Teaching in Physical Education*, *3*(1), 3–15. https://doi.org/10.1123/jtpe.3.1.3

Lawson, H. A. (1983b). Toward a model of teacher socialization in physical education: The subjective warrant, recruitment, and teacher education. *Journal of Teaching in Physical Education*, *2*(3), 3–16. https://doi.org/10.1123/jtpe.2.3.3

Lawson, H. A. (1986). Occupational socialization and the design of teacher education programs. *Journal of Teaching in Physical Education*, *5*(2), 107–113. https://doi.org/10.1123/jtpe.5.2.107

MacPhail, A., Patton, K., Parker, M., & Tannehill, D. (2014). Leading by example: Teacher educators' professional learning through communities of practice. *Quest*, *66*(1), 39–56. https://doi.org/10.1080/00336297.2013.826139

McCullick, B. A., Lux, K. M., Belcher, D. G., & Davies, N. (2012). A portrait of the PETE major: Re-touched for the early twenty-first century. Physical Education & Sport Pedagogy, *17*(2), 177–193. https://doi.org/10.1080/17408989.2011.565472

Merriam, S. B. (2009). *Qualitative research and case study applications in education* (3rd ed.). Jossey-Bass.

Napper-Owen, G. E., Marston, R., Van Volkinburg, P., Afeman, H., & Brewer, J. (2008). What constitutes a highly qualified physical education teacher? *Journal of Physical Education, Recreation & Dance*, *79*(8), 26–51. https://doi.org/10.1080/07303084.2008.10598228

Parker, M., & Patton, K. (2017). What international research evidence tells us about effective and ineffective forms of teacher continuing professional development. In C. D. Ennis (Ed.), *Routledge handbook of physical education pedagogies* (pp. 447–460). Routledge.

Patton, K., Parker, M., & Tannehill, D. (2015). Helping teachers help themselves: Professional development that makes a difference. *NASSP Bulletin*, *99*(1), 26–42. https://doi.org/10.1177/0192636515576040

Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Sage.

Pink, S. (2007). *Doing visual ethnography* (2nd ed.). Sage. https://doi.org/10.4135/9780857025029

Richards, K. A. R., & Gaudreault, K. L. (2017). *Teacher socialization in physical education: New perspectives*. Routledge. https://doi.org/10.4324/9781315679471

Richards, K. A. R., Gaudreault, K. L., & Woods, A. M. (2018). Personal accomplishments, resilience, and perceived mattering as inhibitors of physical educators' perceptions of marginalization and isolation. *Journal of Teaching in Physical Education*, *37*(4), 78–90. https://doi.org/10.1080/00336297.2013.804850

Richards, K. A. R., Templin, T. J., & Gaudreault, K. L. (2013). Organizational challenges and role conflict: Recommendations for the preparation of physical education teachers. *Quest*, *65*(4), 442–457. https://doi.org/10.1080/00336297.2013.804850

Richards, K. A. R., Templin, T. J., & Graber, K. (2014). The socialization of teachers in physical education: Review and recommendations for future works. *Kinesiology Review*, *3*(2), 113–134. https://doi.org/10.1123/kr.2013-0006

Sears, J. V., Edgington, W. D., & Hynes, J. W. (2014). The effect of professional development on physical education instruction in middle schools. *Middle School Journal*, *45*(5), 25–31. https://doi.org/10.1080/00940771.2014.11461897

SHAPE America. (2009). *Appropriate instructional practice guidelines, K–12: A side-by-side comparison*. https://www.shapeamerica.org/standards/guidelines/upload/Appropriate-Instructional-Practices-Grid.pdf

SHAPE America. (2017). *National standards for initial physical education teacher education*. https://www.shapeamerica.org/accreditation/upload/National-Standards-for-Initial-Physical-Education-Teacher-Education-2017.pdf

Srean, M., & Curtner-Smith, M. (2009). Influence of occupational socialization on two preservice teachers' interpretation and delivery of the sport education model. *Journal of Teaching in Physical Education*, *28*(1), 38–53. https://doi.org/10.1123/jtpe.28.1.38

Stroot, S. A. (2001). Once I graduate, am I an expert? *Teaching Elementary Physical Education*, *12*(2),18–20.

Stroot, S. A., & Ko, B. (2006). Induction of beginning physical education teachers into the school setting. In D. Kirk, D. Macdonald, & M. O'Sullivan (Eds.), *The handbook of physical education* (pp. 425–448). Sage Publications. https://doi.org/10.4135/9781848608009.n24

Van Maanen, J., & Schein, E. (1979). Toward a theory of organizational socialization. *Research in Organizational Behavior*, *1*, 209–264.

Wang, C., & Burris, M. (1997). Photovoice: Concept, methodology and use for participatory needs assessment. *Health Education and Behavior*, *24*(3), 369–387. https://doi.org/10.1177/109019819702400309

Zeichner, K. M., & Gore, J. M. (1990). Teacher socialization. In W. R. Houston, M. Haberman, & J. Sikula (Eds.), *Handbook of research on teacher education* (pp. 329–348). Macmillan Publishing Company.

The Physical Educator Vol. 78 • pp. 415–429 • 2021
https://doi.org/10.18666/TPE-2021-V78-I4-10593

PHYSICAL ACTIVITY

College Students' Perceptions of Social Interactions in College Physical Activity Classes

David C. Barney and Teresa Leavitt

Abstract

Physical activity (PA) has been found to benefit a person in many ways. One benefit of being physically active is the social component. This deals with interacting with someone before, during, or after the activity. The purpose of this study was to investigate the effects of social interactions on college-aged students during their PA class. Participants for this study included 408 college-aged students (272 males, 136 females) who were surveyed regarding their interactions during their PA class. The survey contained Likert scale questions and open-ended questions, which required the students to respond with written answers. In short, these students thought that their interactions during their PA were important and that the interactions were enjoyable. These results, along with other results from this study, highlight the positive benefits that come from being involved in PA.

David C. Barney, Department of Teacher Education, Brigham Young University. Teresa Leavitt, Department of Teacher Education, Brigham Young University. Please send author correspondence to David_Barney@byu.edu

The literature has strongly endorsed the benefits of physical activity (PA) in a person's life. For example, PA can reduce risks of cardiovascular disease (Altavilla et al., 2018), diabetes (Bassuk & Manson, 2005), osteoporosis (Dhurup, 2012), and depression (Schuch & Stubbs, 2019). Brown and Fry (2014) established the benefits of PA for college-aged students and noted that one of the main opportunities for being physically active comes through PA classes offered through their university or college. Four-year colleges and universities and community and junior colleges all offer physical education classes to their students (Cardinal et al., 2012; Strand et al., 2010). These classes, also known as PA classes, lifetime activity courses, or basic instruction courses, are offered for the purpose of providing PA options for college students (Barney & McGaha, 2006). Friedrich-Cofer (1985), Leigh (1982), and Welch (1967, 1975, 1982) found that PA courses have a long history, which began at Amherst College in Massachusetts in 1861. Amherst provided activities that would help their students maintain their health and that would relieve the strain associated with their "academic courses" (Van Dalen & Bennett, 1953, p. 368). These college PA classes are typically taught by graduate students working toward a master's or doctoral degree (Wahl-Alexander & Curtner-Smith, 2018). Currently, the requirement of a PA class for a student to earn a baccalaureate degree has declined since the inception of PA classes being offered to college students. Cardinal et al. (2012) discovered that only 39.5% of 4-year institutions require students to take PA classes to graduate. With this being the case, large numbers of college students miss out on opportunities on specific days and at designated times to be physically active while attending college.

College students take PA classes for a variety of reasons. Barney and McGaha (2006) studied why college students took basketball or tennis classes and the likelihood of being active in these activities after graduation. They found that college students participated in these PA classes to have fun, to get exercise, to complete credit for graduation, to improve skills in the sport, to have a social outlet, and to relieve stress. One finding about PA classes serving as a social outlet revealed that social interactions with friends led to the development of life skills and positive relationships, positively affecting the PA over a person's lifetime.

The research has highlighted that socializing during PA has positive effects for the individual. The social component of PA can have different effects on a person. Fahey et al. (2017) reported several benefits a person might experience through social interactions with a partner/friend during an activity: motivation, safety purposes, adherence to activities, and time to talk with their partner/friend. Burke et al. (2006) studied the effects of exercising with a group of people as compared to exercising at home alone. The researchers concluded that exercising with a group of people is better than exercising at home alone. They summarized that when someone exercises with a group of people, the amount of contact with the others aids in obtaining the health benefits of exercise. A built-in social support exists in the form of encouragement and social interactions. Another study looked at social interactions in a college PA class, more specifically examining a caring climate in an exercise setting in relationship to well-being, hope, happiness, and perceived self-concept (Brown & Fry, 2014). The researchers defined a caring climate as one that fosters cooperation and in which members feel welcomed by and comfortable with their classmates and instructor. They concluded that college students in college PA classes experienced greater hope and happiness when they perceived a caring climate.

Barney et al. (2014) studied the effects of college students' perceptions of participation in PA classes on stress in their lives. The results of the study indicated that the college students perceived that their participation in the PA class helped them to manage stress while in college. A secondary finding from this study was that the students felt that the socializing they had during their PA classes helped them cope with stress in their overall lives, not necessarily just stress related to being college students. The study found that 75% of the males and 85% of the females felt that the socializing aspect of their PA classes helped them to cope with stress in their life. Student comments dealing with socializing during their PA classes included "I have met people in class and talking to them about anything and how I deal with things," "I can unwind to visit and talk through some of my stressors," and "Because I can talk and joke they [students] don't know anything I'm going through so they don't bring it up" (p. 159).

In alignment with research, direction is given to PA instructors to purposefully provide socializing opportunities for students. The National Association for Sport and Physical Education (NASPE) has created a document titled *Appropriate Instructional Practice Guidelines for Higher Education Physical Activity Programs* (NASPE, 2014), which gives "guidance to colleges and universities for offering quality instructional physical activity programs" (p. 3). The document has seven topic areas to assist the college PA instructor: (1) Administration/Support, (2) Assessment, (3) Curriculum, (4) Instruction Strategies, (5) Program Staffing, (6) Learning Environment, and (7) Professionalism. An example of an appropriate instructional practice in the Curriculum section, states,

> Program offerings include content that allows students to develop social skills (cooperation and communication) and responsible behavior that will lead them to become productive members of society. Curriculum is designed to ensure that these skills are taught intentionally and are not left for "teachable moments" only. (p. 26)

This statement encourages college PA instructors to put students in situations to socialize in a positive manner, which allows them to be responsible in social situations when involved in PA. With the literature and research presented, we hope that this study will shed light on the important benefits of social interactions for college-aged students during PA. Thus, the purpose of this study was to further investigate the effects of social interactions on college-aged students during their PA classes.

Method

Participants

Participants for this study included 408 college-aged students (272 males, 136 females) from a private university in the Western United States. Participants comprised both undergraduate students (94 freshman, 96 sophomores, 86 juniors, and 119 seniors) and graduate students (13). The participants were enrolled in volleyball, basketball, bowling, Zumba, and badminton activity classes. The

university Institutional Review Board (IRB) granted approval for this study to be conducted.

Instrumentation

A review of the literature failed to identify an instrument specific to addressing social interactions during PA. Therefore, after reading through the literature, we developed a 14-question survey instrument (see Table 1). The survey consists of three Likert scale questions, eight open-ended questions, and three demographic questions. To establish content validity, we had college-aged students and three physical education faculty review the survey questions for clarity and understanding (Barney et al., 2012). The survey was pilot-tested on college-aged students who did not participate in this study. Following the pilot test, we performed checks on the instrument and found it reliable.

Table 1
Social Interactions in Physical Activity Classes

The following survey questions will ask you about experiences dealing with social interactions you have had in your physical activity class. Questions will ask you to circle your answer and respond from your experiences dealing with your social interactions in your physical activity class. Thank you for participating in this survey.
1. How important are the interactions you have in your physical activity class to you? Very Important Important Not a Big Deal Not Important Not at All
2. Have you found your interactions with classmates during your physical activity class enjoyable or not enjoyable? Enjoyable Neutral Not Enjoyable
3. What positive interactions have you had with your classmates in your physical activity class? Please give some examples.
4. What negative interactions have you had with your classmates in your physical activity classes?

Table 1 (cont.)

5. Have your interactions with your classmates during your physical activity class been beneficial or non-beneficial? Please explain your answer.

6. Have your interactions you have had with classmates carried on outside of your physical activity class? Please explain your answer.

7. Have your interactions with classmates positively or negatively affected your experience in your physical activity class? Please explain your answer.

8. Have you noticed if your interactions with your classmates in your physical activity class have helped you manage stress in your life (school, family, dating and others)? Please explain your answer.

9. What factors led to you forming interactions (or not) in your physical activity class? Please explain your answer.

10. When do your social interactions take place?
    ___ During Class
    ___ Before or After Class
    ___ Both

11. Do you feel these social interactions you have in your physical activity class will have a positive or negative effect on your physical activity throughout your life? Please explain your answer.

Gender: Male _____Female _____

Academic Year: _____ Freshman _____ Sophomore _____ Junior
_____Senior _____ Grad Student

STAC Class (ex. Volleyball, basketball, Bowling)

Procedures

Convenience sampling was employed for data collection for the study. We contacted the instructors of the PA course, explaining both the study and the survey. After obtaining instructor agreement, we attended each PA class (16 total classes) and administered the survey to the students. For this study, 97% of the students agreed to participate by taking the survey. All students were assured that their

voluntary decision to participate in the study would not affect their grade in the class or their class standing.

Data Analysis

For the quantitative data, descriptive statistics were derived from the survey. We conducted qualitative data analysis consisting of thematic content analysis. To accomplish thematic content analysis of respondents' short answers, we completed multiple readings of the data, noting emerging themes that became evident for each survey question (Mueller & Skamp, 2003).

Results

Table 2 shows the descriptive statistics about student interactions in PA class. The first statement on the survey asked college students, "How important are the interactions you have in your physical activity class to you?" For this statement, a majority of the male participants felt their interactions were very important (17%) or important (42%), and a majority of female participants also felt their interactions were very important (16%) or important (51%). A third of the college students were neutral (38% males, 33% females) regarding their interactions in their PA class. The second statement asked the college students, "Have you found your interactions with classmates during your physical activity class enjoyable or not enjoyable?" A majority of the students (88% males, 89% females) felt the interactions were enjoyable. Statement 10 asked, "When do your social interactions take place?" Again, a majority (60% males, 63% females) had interactions before and after class, while 37% of the males and 30% of the females had interactions only during class.

Other data collected for this study included short answer responses from seven survey statements. When asked what positive interactions they had with classmates in their PA classes (Statement 3), common student responses included "I made new friends" (Julie), "It's fun to get to know people and share experiences" (Carol), and "People have been friendly and not judgmental when I or anyone else get something wrong. For example, if I ever mess up with a serve, no one judges or minds" (Susan). Students were asked what negative interactions they have had with classmates in their PA class (Statement 4). Two common responses to this survey question included "too competitive" and "ball hogs." Other comments for this

Table 2
Results From Social Interactions in Physical Activity Classes

Question/answer	Male %	Female %
How important are the interactions you have in your physical activity class to you?		
Very Important	17	16
Important	42	51
Not a Big Deal	38	33
Not Important	3	0
Not at All	0	0
Have you found your interactions with classmates during your physical activity class enjoyable or not enjoyable?		
Enjoyable	88	89
Neutral	12	11
Not Enjoyable	0	0
When do your social interactions take place?		
During	37	30
Before or After Class	3	7
Both	60	63

survey statement included "Trash talking. People who think they know the sport" (Mark) and "Being co-ed classes I've found it takes about a third of the semester for guys to take girls seriously as athletes with skills equal to theirs" (Jennifer).

When asked if their interactions in their PA class were beneficial or non-beneficial (Statement 5), a majority (88% males, 89% females) of the students stated that their interactions were beneficial because their PA class was a "good way to meet people" (Rosie). Another common response was that their interactions in PA class helped relieve stress. Other responses for this statement included "Knowing that I have friends to talk to is comforting" (Kathy) and "This class helps me stay sane" (Robert). Despite this, a number of the students were "neutral" in regard to their interactions during

their class. For Statement 6, students were asked if their interactions they had in their PA class have carried on outside of their PA class. For this statement, we noticed two themes. The first was that a PA class resulted in some students continuing PA beyond the class by finding players for their intramural teams. One student stated, "As I play basketball in class, I can find good players to be on my intramural team" (Joe). A second theme was that socializing among students included personal relationship with a classmate from their PA class. One student said, "I went on a couple dates with a nice girl from my basketball class" (Frank). The next survey question asked the students if their interactions with their classmates positively or negatively affected their experience in their PA class (Statement 7). Student responses included "I actually really look forward to the class and not solely because of the bowling" (Stan) and "They have very positively affected my experience. I have felt more comfortable and secure and as a result learned better and enjoyed myself more" (Rose). Another student stated, "My first class was negative because I was intimidated, but now it's positive" (Wilma). Another student indicated her experience was not positive when she stated, "So many boys make me feel inadequate when I played" (Marilyn).

The study also sought to understand what factors led students to forming (or not forming) interactions with classmates (Statement 9), whether such interactions would have a positive or negative effect on their PA throughout their lives (Statement 11), and if these interactions helped them manage stress in their lives (Statement 8). In terms of forming interactions, the student said their interactions "naturally happened" because of the sports in which they were participating. One student stated, "Being part of a team" (George). Another student said, "You form friendships by just playing" (Edward). It seems that interactions are a natural part of PA courses, though this may come more easily for some than others. Again, students' survey responses reflected that their participation and experiences in the PA class would translate into their lives after college. One student said that "this class would make me more willing to sign up for community teams in the future" (Stan). A positive effect from interactions in PA classes was found for students in regard to handling stress. Student responses included "We always talk about how our week has been and sometimes talk about hard things. It's nice to know

someone cares" (Heather) and "Interactions with people keep me less stressed" (Heather). It should be noted that a majority of the students' survey responses indicated that PA relieved their stress but did not necessarily make it easy to interact with their classmates.

Discussion

The purpose of this study was to investigate the effects of social interactions on college-aged students during a PA class. It was generally found that college students' interactions had a positive effect on them in and out of class and potentially long term. These results highlight the power PA can have on a person's life. The survey results showed what kind of interactions they have had, if their interactions were beneficial, if their interactions positively or negatively affected their experience in the PA class, and the effects of their interactions on future PA in their life.

The results of this study coincide with previous research. For example, Kahn et al. (2002) conducted a systematic review of certain interventions to increase PA. One of the interventions the researchers discussed was the social support interventions. They discussed building, strengthening, and maintaining social networks. They call this having a "buddy system." Having a buddy system gives the participant a chance to maintain and to strengthen relationships that help with a person's PA. For this study, students felt that participating with their classmates on teams helped them build friendships. These results imply that having someone to be with during PA greatly helps the person stay on task with the activity. Thus, as a person stays involved during the activity, they receive the benefits of the activity.

Another finding from this study that coincides with the literature is that the students felt their interactions with classmates during their PA class were beneficial. Burke et al. (2006) studied the effects of people who exercised with people or as a group and those who stayed home and exercised on their own. They found that those who exercised with people had support in the form of being with someone to keep them on task with their exercises. The researchers stated that exercising with people is better than exercising on one's own. This study found that the students felt it was beneficial for them because they were with friends—and because they were with friends, they looked forward to coming to class, and in many cases, they wanted to come to class and have those interactions during class activities.

These results illustrate that if students look forward to coming to class, they will have better attitudes about their participation, thus leading to greater learning from class participation.

Other discussion points from the results of this study include student interactions in their PA class and if the PA class helped them manage stress in their life. VanKim and Nelson (2013) studied the association of vigorous PA with mental health, perceived stress, and socializing with college-aged students. They found that when college students' PA was vigorous and they socialized during their PA class, the benefits were positive in regard to mental health and stress. For this study, many of the students felt that the PA relieved their stress more than the socializing did. Yet one student felt that the PA provided opportunities to talk to classmates, which helped them to deal with stress from school. These results hint that PA instructors need to do all they can to have their students as active as possible. PA instructors need to plan activities in which students are not standing in line or waiting around for instructions or activities. A final discussion point from the study was, do the students feel their interactions have any effect on their future PA?

Barney and McGaha (2006) studied college students' perspectives on taking PA courses (basketball and tennis) and if participation in these courses influenced their participation after the courses were completed. One student responded, "As I get older, playing basketball will help me stay fit and give me the chance to be with friends" (p. 25). Many of the other student responses to this question used the word "confident" or "confidence" in regard to future participation later in life. For this study, a majority of the students concurred with previous research when they stated, "I am building healthy habits that will help me be active in my later years" and "I would be willing to sign up for community teams in the future" (p. 25). These results show that even at the relatively young age of a college student, there is a strong possibility for lifelong PA for those who participate in PA classes. These results should be shared with college administrators to inform them of the effect of college PA classes on a person's life. The results from this study add to the limited research highlighting the positive benefits of social interactions that can and do take place in a PA setting. These results provide further evidence that PA courses are important and that when taken these courses can be beneficial

for students. Cardinal et al. (2012) found that many 4-year colleges and universities do not require PA courses for graduation. If this is the case, then, as Li et al. (2009) put forth, "Greater attention must be paid to [college students'] health and physical activity habits to help them establish positive health and physical activity trajectories across their life course" (p. 34).

Implications for College Physical Activity Classes

The results from this study reinforce to college PA programs that they are doing more than helping their students improve their skills, cardiovascular functions, and strengthen muscles. They are helping their students form friendships that have the possibility of lasting throughout their life. In addition, they are talking through situations that they believe to be stressful at this time in the students' lives and that such interactions are helping the students manage and work through the stress or certain situations in their lives. The interactions students are having affect the learning of activities in which they are participating. The outcomes that students are reporting as positive will benefit college students as they participate during their college experience and throughout their life. One student perfectly conveyed this sentiment by stating, "I think there is more going on here than just playing volleyball."

Limitations

Two primary limitations to this study are noted. First, the participants came from one university. Second, the research study was conducted at a private university. Thus, the participants may not be representative of participants from other colleges or universities or geographic regions, which may limit the generalizability of the findings. Thus, the conclusions and implications are limited and perhaps mostly applicable to those participants' demographics. Further research with a broader demographic would provide a richer data set to ascertain the generalizability of the conclusions and implications in the study.

References

Altavilla, G., D'Elia, F. D., & Raiola, G. (2018). A brief review of the effects of physical activity in subjects with cardiovascular disease: An interpretive key. *Sport Mont*, *16*(3), 103–106. https://doi.org/10.26773/smj.181018

Barney, D., Benham, L., & Haslem, L. (2014). Effects of college students' participation in physical activity classes on stress. *American Journal of Health Studies*, *29*(1), 155–160.

Barney, D., Gust, A., & Liguori, G. (2012). College students' usage of portable music players (PMP) during exercise. *ICHPER*SD Journal of Research*, *7*(1), 23–26.

Barney, D., & McGaha, P. (2006). College students' perspective and after course participation in basketball and tennis classes. *Journal of International Council for Health, Physical Education, Recreation, Sport, and Dance*, *42*(3), 23–26.

Bassuk, S. S., & Manson, J. E. (2005). Epidemiological evidence for the role of physical activity in reducing risk of type 2 diabetes and cardiovascular disease. *Journal of Applied Physiology*, *99*(3), 1193–1204. https://doi.org/10.1152/japplphysiol.00160.2005

Brown, T. C., & Fry, M. D. (2014). College exercise class climate, physical self-concept, and psychological well-being. *Journal of Clinical Sport Psychology*, *8*(2), 299–313. https://doi.org/10.1123/jcsp.2014-0031

Burke, S. M., Carron, A. V., Eys, M. A., Ntoumanis, N., & Estabrooks, P. A. (2006). Group versus individual approach? A meta-analysis of the effectiveness of interventions to promote physical activity. *Sport & Exercise Psychology Review*, *2*(1), 19–35.

Cardinal, B. J., Sorensen, S. D., & Cardinal, M. K. (2012). Historical perspective and current status of the physical education graduation requirements at American 4-year colleges and universities. *Research Quarterly for Exercise and Sport*, *83*(4), 503–512. https://doi.org/10.1080/02701367.2012.10599139

Dhurup, M. (2012). A dimensional analysis of the benefits derived from physical activity participation among university students and variation in terms of gender. *African Journal for Physical, Health Education, Recreation, and Dance*, *18*, 614–627.

Fahey, T. D., Insel, P. M., Roth, W. T., & Insel, C. E. A. (2017). *Fit & well: Core concepts and labs in physical fitness and wellness* (12th ed.). McGraw Hill Education.

Friedrich-Cofer, L. K. (1985). The legacy of Edward Hitchcock. *Journal of Physical Education, Recreation, and Dance*, *56*(9), 24–29. https://doi.org/10.1080/07303084.1985.10603820

Kahn, E. B., Ramsey, L. T., Brownson, R. C., Heath, G. W., Howze, E. H., Powell, K. E., Stone, E. J., Rajab, M. W., & Corso, P. (2002). The effectiveness of interventions to increase physical activity: A systematic review. *American Journal of Preventive Medicine*, *22*(4, Suppl. 1), 73–107. https://doi.org/10.1016/S0749-3797(02)00434-8

Leigh, M. H. (1982). Edward Hitchcock, Jr., dean of the profession. *Journal of Physical Education, Recreation, and Dance*, *53*(8), 19–21. https://doi.org/10.1080/07303084.1982.10631163

Li, K. K., Cardinal, B. J., & Settersten, R. A. (2009). A life-course on physical activity promotion: Application and implications. *Quest*, *61*(3), 33–36. https://doi.org/10.1080/00336297.2009.10483620

Mueller, A., & Skamp, K. (2003). Teacher candidates talk: Listen to the unsteady beat of learning to teach. *Journal of Teacher Education*, *54*(5), 428–440.

National Association for Sport and Physical Education. (2014). *Appropriate instructional practice guidelines for higher education physical activity programs.*

Schuch, F. B., & Stubbs, B. (2019). The role of exercise in preventing and treating depression. *Current Sports Medicine Reports*, *18*(8), 299–305. https://doi.org/10.1249/JSR.0000000000000620

Strand, B., Egeberg, J., & Mozumdar, A. (2010). Health-related fitness and physical activity courses in U. S. colleges and universities. *The International Council for Health, Physical Education, Recreation, Sports, and Dance Journal of Research*, *5*(2), 17–20.

Van Dalen, E. D., & Bennett, B. L. (1953). *A world history of physical education.* Prentice-Hall.

VanKim, N. A., & Nelson, T. F. (2013). Vigorous physical activity, mental health, perceived stress, and socializing among college students. *American Journal of Health Promotion*, *28*(1), 7–15. https://doi.org/10.4278/ajhp.111101-QUAN-395

Wahl-Alexander, Z., & Curtner-Smith, M. D. (2018). Influence of negotiations on graduate teaching assistants' instruction within university activity courses. *Journal of Teaching in Physical Education, 37*(2), 164–174. https://doi.org/10.1123/jtpe.2017-0091

Welch, J. E. (1967). The impact of Edward Hitchcock on the history of physical education. *The Physical Educator, 24*, 54–56.
Welch, J. E. (1975). Edward Hitchcock, M. D. founder of physical education in the college curriculum. In E. F. Zeigler (Ed.), *A history of physical education and sports in the United States and Canada* (pp. 121–127). Stipes.
Welch, J. E. (1982). Pioneering in health education and services of Amherst College. *Journal of American College Health*, *30*(6), 289–295. https://doi.org/10.1080/07448481.1982.9938911

The Physical Educator Vol. 78 • pp. 430–436 • 2021

YOU AND THE LAW

Negligence in Sport

Stephen Picucci, Michael G. Hypes, Julia Ann Hypes

Jennifer Bradley, Plaintiff, v. National Collegiate Athletic Association, et al., Defendants

United States District Court for the District Of Columbia, April 12, 2017, Decided

Jennifer Bradley (plaintiff) was a junior year student athlete at the University in Washington, D.C. Bradley played field hockey for the university, and in September 2011, she was hit on the head during a field hockey game between the university and Richmond University. After that hit, she began experiencing symptoms of a concussion, but continued to play hockey in practice and games. The plaintiff was not advised to sit out of practices and games, despite her symptoms persisting and a diagnosis of a concussion being confirmed. The plaintiff claimed the injury caused harm to her physical, emotional, and mental state. Paying monetary damages and the staff failing to appropriately treat her condition led to this situation. The plaintiff filed actions against the National Collegiate Athletic Association (NCAA), the Patriot League, the University, the Medicine Center, David L. Higgins, and Aaron Williams.

Stephen Picucci, Athletic Department, University of Missouri, St. Louis. Michael G. Hypes, School of Business Administration, Morehead State University. Julia Ann Hypes, School of Business Administration, Morehead State University. Please send author correspondence to m.hypes@moreheadstate.edu

The issues of this case include (1) NCAA being careless and negligent by breaching the duties of care it assumed for the benefit of the plaintiff; (2) NCAA negligence leading to severe emotional distress; (3) NCAA for false representation to her by stating it "undertook and assumed a duty to protect the physical and mental well-being of all student-athletes participating in intercollegiate sports . . . [and] to protect student-athletes from brain injuries"; (4) NCAA for failing to protect her physical and mental well-being and protecting her from brain injuries; (5) NCAA for medical malpractice and not providing the care she needed; (6) the Patriot League for carelessness and negligence by breaching the duties of care assumed for the benefit of the plaintiff, especially for failing to "provide and oversee a management system for [the treatment of the] concussion" that she suffered; (7) the Patriot League for negligent infliction of emotional distress; (8) the Patriot League for breach of contract; (9) the Patriot League for medical malpractice; (10) The University for negligence through breaching duties of care assumed for benefit of plaintiff; (11) the University for negligent infliction of emotional distress; (12) the University for breach of contract; (13) the University for medical malpractice; and (14) the Medicine Center, Dr. Higgins, and the Higgins Practice for negligent infliction of emotional distress.

Findings in the Case

1. The NCAA filed a motion to dismiss the claim of negligence. The claim of negligence alleged that the NCAA was careless and negligent by breaching the duties of care it owed the plaintiff. The plaintiff had to establish that the defendant owes a duty of care to the plaintiff, the defendant breached that duty, and the breach of duty proximately caused damage to the plaintiff. The plaintiff was able to plead facts sufficient to establish a claim of negligence as the NCAA took a duty to protect the physical and mental well-being of all student athletes participating in intercollegiate sports and a duty to protect student athletes from brain injuries. The plaintiff claimed that this negligence caused her to suffer economic and noneconomic damages as well as deterioration of her mental status. The court denied the NCAA's motion to dismiss with respect to plaintiff's negligence claims against it.

2. The NCAA's motion to dismiss claims of gross negligence, negligent infliction of emotional distress, fraudulent misrepresentation, breach of contract, and medical malpractice were granted as the plaintiff asserted a claim of gross negligence only for the purpose of recovering punitive damages. As neither gross negligence nor punitive damages are standalone cause of actions in the District of Columbia, the court dismissed gross negligence claim against the NCAA. The plaintiff did not plead facts sufficient to state a claim of negligent infliction of emotional distress nor did she allege any facts to demonstrate how the NCAA's representations were allegedly false or sufficient facts to establish a valid contract between her and the NCAA for the full duty or obligation to provide her medical treatment. Finally, the medical malpractice claim was dismissed as the plaintiff failed to show how she was entitled to relief through either direct liability or vicarious liability against the NCAA.
3. The Patriot League filed a motion to dismiss claims of negligence. The claim of negligence alleged that the Patriot League caused a negligent infliction of emotional distress, a breach of contract, and medical malpractice. The plaintiff was not able to show reasonable inference that the Patriot League owed her a legal duty of care. The plaintiff did not allege facts sufficient to plausibly state a claim of negligent infliction of emotional distress against the Patriot League, and because her allegations did not rise to the level necessary to state a claim of entitlement to relief, this was also dismissed. For both breach of contract and medical malpractice against the Patriot League, the plaintiff failed to identify a valid contract between her and the Patriot League and to demonstrate that the Patriot League is an authorized health provider, and therefore they are not liable for her alleged injuries.
4. The University was found to be negligent by breaching the duties of care assumed for the benefit of the plaintiff. The court concluded that it was reasonably foreseeable that the University did not take the necessary precautions to minimize additional risks to her injuries by prohibiting her from participating in field hockey activities with a risk of additional

injuries. Therefore, the plaintiff had alleged facts sufficient to show a duty of care from the University. Their motion to dismiss was denied. The motion to dismiss the plaintiff's medical malpractice claim was also denied without prejudice as the University provided health care to its student athletes and the plaintiff was shown to have a concussion from tests the University's athletic trainers and physicians gave her, which were considered medical services.

5. The plaintiff failed to allege facts sufficient to show the university had a special relationship with her that implicated her emotional well-being; therefore, the emotional distress claim against the University was dismissed, as was the breach of contract, as the plaintiff failed to provide any contracts including an obligation or duty owed by the University.
6. The motion of the Medicine Center, Dr. Higgins, and the Higgins Practice to dismiss was granted as the plaintiff did not allege that her serious emotional distress was caused by the medical defendants' negligent performance of care, but instead she relied on medical research suggesting that head injuries may lead to depression or other brain injuries. Her complaint was therefore dismissed.

Verdict of the Court

The court found the plaintiff was able to plead facts sufficient to establish a claim of negligence against the NCAA, as they took a duty to protect the physical and mental well-being of all student athletes participating in intercollegiate sports and a duty to protect student athletes from brain injuries. The motion was granted for the plaintiffs' claims of negligence, but denied for the other claims.

The court found the University was liable for breaching the duties of care assumed for the benefit of the plaintiff by not taking the precautions necessary to prevent her from further damage from her concussion. The court also found the University provided her with medical tests through the athletic trainers, which was sufficient to show her medical malpractice case against the University could not be dismissed. The plaintiffs claim of negligence and medical malpractice claims were granted, and the motion to dismiss by the university was denied.

Definition of Terms

- **Borrowed servant doctrine:** The common law principle that the employer of a borrowed employee, rather than the employee's regular employer, is liable for the employee's actions that occur while the employee is under the control of the temporary employer. Sometimes referred to as borrowed employee doctrine.
- **Sovereign immunity:** A legal doctrine that says that a state cannot be sued by a citizen of the state.
- **Exhaustion requirements (exhaustion of remedy):** The principle that states that you should do everything possible to correct the situation before seeking help from a court.
- **Fraudulent concealment:** Intent to deceive or defraud in a contractual arrangement by deliberate hiding, nondisclosure, or suppression of a material fact or circumstance legally or morally bound to reveal. Also referred to as suppression of evidence.
- **Tortfeasor:** A person who commits a tort, delict, or quasi-offense.
- **Prima facie:** Lat. At first sight; on the first appearance; on the face of it; so far as can be judged from the first disclosure; presumably. "A litigating party is said to have a *prima facie* case when the evidence in his favor is sufficiently strong for his opponent to be called on to answer it. A *prima facie* case, then, is one which is established by sufficient evidence, and can be overthrown only by rebutting evidence adduced on the other side. In some cases the only question to be considered is whether there is a *prima facie* case or no. Thus a grand jury are bound to find a true bill of indictment, if the evidence before them creates a prima facie case against the accused; and for this purpose, therefore, it is not necessary for them to hear the evidence for the defense" (Mozley & Whitley, 1904, p. 238; see also *State v. Hardelein*, 109 Mo. 579, 70 S. W. 130; *State v. Lawlor*, 28 Minn. 210, 9 N. W. 698).

Risk Management

An issue that sometimes arises within this setting is whether the university is liable under respondeat superior for negligent acts of University athletes. Courts have ruled that applicability of the doctrine requires an individualized determination of whether a master servant relationship exists between the tortfeasor and the university. Whether on scholarship or not, the athlete is not an employee and the university is not liable for the athletes negligent acts.

In this situation, the University motion to dismiss the case of negligence was denied as the education of the staff at the university was not at the level it should have been to appropriately treat the athlete.

Therefore, some risk management tips include the following:

1. Education for athlete coaches on concussions, including what to look for if an athlete has had any kind of injury to the head. The athlete and coach should also build a trust in the athletes to be able to report any potential concussions to the coaches if it occurred away from the coach. The coach should be educated on signs and symptoms to look out for in athletes to know when to send the athlete to get medical treatment and sit out of practice and games if they are showing signs or symptoms of concussion.
2. Education for the medical staff at the university is also critical, and a procedure should be created for the staff to follow upon first report of any kind of concussion. This should involve immediate cessation of all exercise once the athlete first reports the concussion until the athlete has either had enough time to recover or their symptoms are completely gone. There should also be education on how to follow up on the athlete and keep track of which athletes have had concussions, as well as education on what to do if an incident should happen again. Every person within the athletic training department, as well as any outside medical professionals who work with the team, should be given some training on treating concussions correctly.

3. An athlete consent form for concussions should be created to hold the athlete liable for their injuries and requiring that they report any head injuries immediately and openly share the symptoms they are experiencing for an extended period after the concussion. The athletes should be given some education with the consent form to be aware of all the symptoms they may face and how serious this can be if ignored.
4. The athletes should also be given information on how to report their concussion and how long they should expect to experience symptoms and therefore sit out of practice. They should be educated on why lying to medical staff about feeling better will leave them liable for further medical issues.

References

Mozley, H. N., & Whitley, G. C. (1904). *Mozley and Whiteley's Law dictionary*. Butterworth. https://archive.org/details/mozleyandwhitel00westgoog/page/n252/mode/2up

Instructions for Authors
The Physical Educator

Author manuscripts must be submitted online (https://js.sagamorepub.com/pe/index) and meet the following guidelines:

Manuscripts must be double spaced in Times New Roman 12-point font in a Microsoft Office Word document. Number the lines of the manuscript, including the references. Manuscripts should be 25 pages or fewer in length, including charts, graphs, graphics, pictures, and tables. Please follow APA 7th edition style guidelines consistently throughout the manuscript.

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

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

Carefully check references to ensure they are correct, included only when they are cited in the text using APA 7th edition style guidelines. Only include references that have been published or accepted for publication.

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

1. An e-mail of acceptance certifying the article will be published in the near future.

2. An e-mail of rejection and copies of reviewers' comments.

3. An e-mail recommending revision and copies of reviewers' comments and suggested revisions. A due date will be listed for resubmission of the revised manuscript.

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