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How Do I Get Funding for Social Science Research in Sport? Move to Europe!

By Penny McCullagh, KT Editor

Research on social science issues related to sport has been conducted for years in North America and around the world. However, over the last 30 years there has been increased pressure for academicians to receive external funding to support their research.

At universities in the United States, life science disciplines (exercise physiology, biomechanics, motor control) have led the way in securing funding related to exercise and physical activity, and the support for research in sport and exercise psychology and sociology of sport have not kept pace. It is my contention that there is still a bias in the funding arena about the importance of sport.

One of the primary federal funding agencies in the United States to support such research would be National Institutes of Health (NIH), but it is only recently that sport has received any attention. In recent

years, there has been focused support from NIH for research on traumatic brain injury in sport (www.ninds.nih.gov/research/tbi), but there is still little evidence of support for studying psychological issues such as motivation related to youth or adult sport.

The European Commission (<http://ec.europa.eu>) is the executive arm of the European Union (EU). The commission provides grants in support of projects that further the interests of the EU or help implement EU policy or programs. The range of topics is very broad, covering all disciplines. Most EU projects are collaborative, with at least three organizations from different EU countries. The EU is also moving forward in supporting developing countries and independent individuals from a host of countries around the world.

Because of my research interests and teaching responsibilities, I attend conferences related to sport and exercise psy-

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chology, motor learning, and motor development. Two longtime colleagues and friends of mine present research at these conferences. Both Joan Duda and Glyn Roberts were professors at major universities in the United States but moved to Europe. There they continued to do their research, primarily related to motivation in youth sport (along with other topics) and, after a few years, received major funding for their projects. (I gleaned most of the following information from their university websites and the EU website.)

- Joan Duda of the University of Birmingham (UK) headed up a multinational project from 2009 through 2013 that included collaborators from France, Spain, Norway, and Greece. The EU supported the €3,785,303 total cost project with €2,980,680. (That is about 3 million in U.S. dollars.) The aim of the project was to promote quality engagement in youth sport (see www.empoweringcoaching.co.uk). Joan is particularly interested in developing, implementing, and evaluating theory-based interventions in a wide variety of populations, with a particular interest in youth sport.

For years Duda has recognized that youth sport forms the foundation for later partici-

pation in physical activity and that children can have both positive and negative experiences in sport. Much of her research over the years has focused on the motivational climate created by coaches, parents, and teammates; she recognizes that the climate can have a profound influence on whether children maintain an interest in sport or drop out. The project—dubbed the PAPA project (**P**romoting **A**dolescent health through an intervention aimed at improving the quality of their participation in **P**hysical **A**ctivity)—developed the Empowering Coaching program, which helps train coaches, instructors, and teachers in



Joan Duda, University of Birmingham (UK)

sport, dance, and physical education. The original program trained over 1,000 football coaches. Data were collected on about 8,000 players; some played for trained coaches and other did not. In addition to measuring physical activity, information was gathered on coach-created climate, motivation to participate, self-esteem, and enjoyment. The findings suggested that youths playing under the leadership of trained coaches felt more empowered—and were more likely to continue to play—than the players under untrained coaches. Coaches indicated that parents can be a major goal in inhibiting a empowering environment. A goal of the project is to reach out to parents to help them support a positive environment. See this website for a short video of the project: www.empoweringcoaching.co.uk/conference

Two other large-scale projects followed in the footsteps of the PAPA project. Take a look at these additional projects: www.birmingham.ac.uk/schools/sport-exercise/research/sport-performance-policy-education.aspx

<http://www.birmingham.ac.uk/schools/sport-exercise/research/showcase/street-games.aspx>

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- Glyn Roberts is in the department of coaching and psychology at the Norwegian University of Sport Science and is the Norwegian PI and project leader for the EuroFIT project. The EuroFIT project is a collaboration between Belgium, Ireland, Netherlands, Norway, Portugal, and the United Kingdom. The total project cost is €7,775,325, and the EU contribution is €5,957,158. (That is more than 6 million U.S. dollars.) This project runs from 2013 to 2018.

The primary motive behind this project is to get unfit football fans moving! The target audience is 1,000 overweight spectators at 15 top-tier clubs in the United Kingdom, Portugal, the Netherlands, and Norway. The program is an evidence- and theory-based program designed to attract participants based on their loyalty to their football club. To accomplish their goal, the researchers



Glyn Roberts, Norwegian University of Sport Science

will engage the power of the football club to collaborate with the researchers and form a social partnership with the fans. In addition to increasing physical activity, a goal of the program is to decrease sitting time. Participants attend 90-minute coaching sessions at the club over a 12-week period. They walk, do physical exercise in the stands and on the field, play walking football, and have discussions on healthy

eating. In addition to activity measurements, physical measurements of weight, BMI, and blood pressure will be taken, and food intake, self-esteem, and quality of life will be assessed. Participants will be compared to a control group who did not receive the intervention.

If the project is successful, the researchers hope to expand the program throughout Europe and to other populations.

See this site for a short video of the project:

<http://www.birmingham.ac.uk/schools/sport-exercise/research/sport-performance-policy-education.aspx>

For more information about EU sport-related projects, see the article “EU to Fund 11 Projects to Promote Sport and Physical Activity for Refugees”:

https://ec.europa.eu/sport/20161122-eu-funds-refugee-sport-physical-activity_en

Exercise Is Not the Path to Strong Bones—Or Is It?

Misconception: All you have to do is walk or do even the most modest strength training exercises to build strong bones.

Actually: Exercise has little or no effect on bone strength.

—“Exercise Is Not the Path to Strong Bones,” *New York Times*

Thought to be an April Fool's Day hoax by some, the article by Gina Kolata on April 1, 2016, titled “Exercise Is Not the Path to Strong Bones,” was real. Kolata's article in the *New York Times* Misconception series stated that exercise was not beneficial to bone strength. The response to this article was so overwhelming that Kolata published a follow-up piece titled “A Second Look at ‘Misconception’ on Exercise and Bones,” clarifying her original points: that she only meant to focus on exercise and bone in adult populations.

I asked Vanessa Yingling, a faculty member in my department who is an expert on bone to take a look at the New York Times articles and respond.

–PMc

Bone Health

By Vanessa Yingling, PhD

Although some studies indicate that exercise has minimal effect on bone strength in adults, only a portion of the large body of literature on this subject was discussed. Cochrane has for years produced systematic reviews of primary research in health care and is recognized as the highest standard in evidence-based resources. In fact, the Cochrane review in 2011 concluded that exercise will improve bone mineral density slightly and exercise

will slightly reduce the chances of having a fracture in postmenopausal women. Exercise has the potential to be a safe and effective way to minimize bone loss.

Kolata brought up, but did not fully discuss, a key point in understanding research on bone health in her follow-up piece: that bone density and bone strength differ. The diagnosis of osteoporosis is currently based on an estimation of bone mineral density (BMD), measured by dual-energy

X-ray absorptiometry (DXA). However, one limitation of the 2-D DXA measure is the lack of architectural information on our bones. The author in these pieces missed an opportunity to educate the public on key aspects of bone health:

1. Architecture is a key component of bone strength.
2. Increasing bone strength in adults is not the goal; the more realistic focus should be on mitigating the rate of bone loss. Kolata's focus was on adults; however, adolescence is a key time period to optimize bone health through exercise, and adults can model that behavior for children.
3. Research has identified unique features for an exercise prescription focused on skeletal health.

Bone Architecture Is a Key Component of Bone Strength

A discussion of bone health, and specifically bone strength, cannot gloss over how these parameters are measured. Stronger bones could and should lead to healthier bones, but direct measurement of bone strength in humans is difficult since most of us would hesitate to have our bones

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broken, even for science. Therefore, new scanning technologies are continually being used to add to our understanding of bone strength.

Best research practice requires the use of 3-D imaging techniques in addition to DXA measures. The strength of our bones cannot be described using just one parameter. A key study (Robling et al., 2002) using adult rats following an exercise protocol reported minimal changes (5 percent) in bone density (BMD) but large changes (64-94 percent) in bone strength. In addition, 50 percent of women and 70 percent of men who sustain a low trauma fracture don't have a diagnosis of osteoporosis (Sanders et al., 2006).

Take Home Point: Factors beyond BMD, such as bone size and architecture, are key components of bone strength.

The strength of most structures is a combination of the material that makes up the structure, the amount of material, and the architecture of the structure. For example, bike frames made of steel are strong, but bike frames made of aluminum can be just as strong if the tubes are much larger. Hollow tubes are as strong or stronger than solid tubes. The strength of hollow structures such as bamboo, flower stems,

bike frames, and our own long bones is due to the distribution of the material away from the center bending axis (second moment of inertia). Figure 1 is an example of two different architectures that yield similar bone strength. In this example, the 36-year-old male has a smaller, more slender bone and thus a smaller moment of inertia, which should render this tibia weaker than that of the 42-year-old male. However, the densities of the bones also differ. The 36-year-old male maintains his bone strength with a denser but smaller

bone, and the 42-year-old male has a larger and less dense bone with the same strength.

Take Home Point: One parameter, such as bone density, *cannot* fully describe bone strength.

Conservation Is Not Acquisition

The goal for much of the population is *not* to gain bone mass but to minimize bone loss. Our bones add and lose bone in a mechanically smart manner. As we age, we lose bone mass mainly from the endocortical surface (inner surface of the bone) but we also form a small amount of bone (even as we age) to the periosteal, or outer, surface of the bone—a mechanically smart process.

Aging results in the overall decrease in the amount of bone, but the size (diameter) of our bone increases to take advantage of the moment of inertia concept.

Take Home Point: Bone strength can be preserved as we lose bone mass (figure 2).

In addition, data suggest that bone does not subscribe to the “use it or lose it” paradigm. Exercise results in increased bone mass added to the outer surface of the

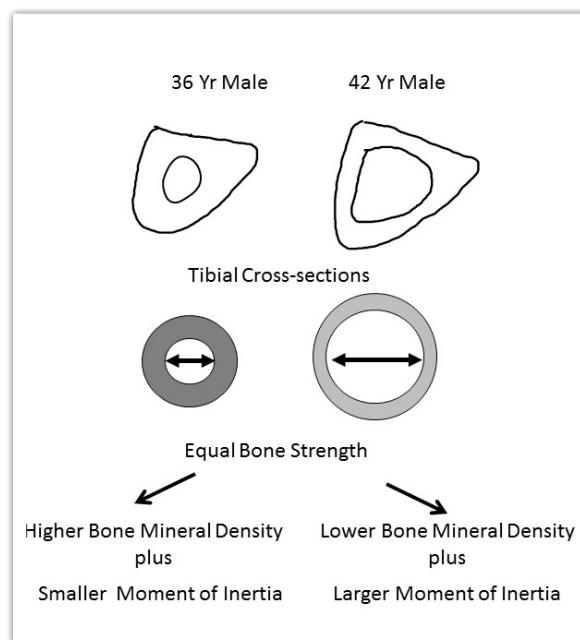


Figure 1. The bones have equal strength.

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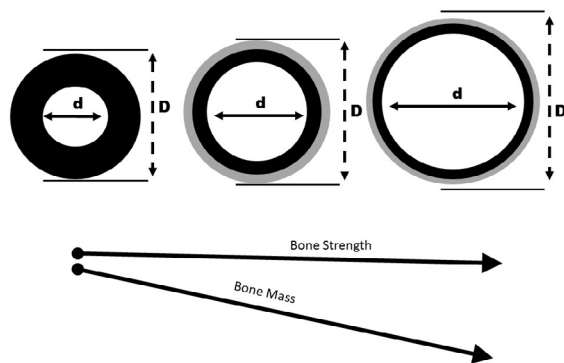


Figure 2. As we age, d (inner diameter of bone) gets larger, but so does D (outer diameter of bone). We lose bone mass (thinner bone) but increase bone size (architecture) and thus maintain strength.

bone (periosteal surface). A study using professional baseball players reported that the gains in bone size and architecture during youth persist later in life. They report that even though bone mass decreased after the players retired, the benefits of bone size and strength persisted (Warden et al, 2014).

Take Home Point: Exercise bone and it may last a lifetime.

Model Good Behavior: Exercise With Your Kids

It may be true that less-than-spectacular results from exercise are reported in adult populations. But as noted in Kolata's article,

exercise has other benefits for fracture reduction, including increased muscle mass that can decrease the risk of falling.

From my perspective, an important reason to exercise is to model behavior for our kids. Adolescence is a key time to optimize bone strength. As illustrated in figure 3, there are two major approaches to decreasing fracture as we age.

1. Decrease the loss of bone during aging
2. Increase the bone strength while we are young so we age gracefully and without fracture

Take Home Point: Exercise during adolescence may strengthen bone for a lifetime.

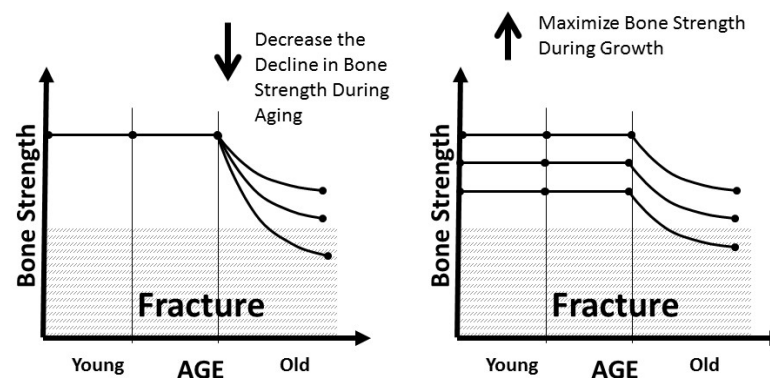


Figure 3. Decrease the rate of bone loss as we age to avoid fracture. Optimize bone strength during growth to avoid fracture.

Exercise Prescription for Bone Health

Although a specific exercise prescription for bone adaptation remains to be determined, Kolata missed an opportunity to highlight what we know at this stage regarding the positive effects of physical activity and sport on bone. Specifically, positive effects result from *unique, variable, and dynamic* loading.

Static loading does not trigger an adaptive response in bone; dynamic exercise is necessary. Also, the applied load must exceed the usual loading conditions to stimulate bone formation. Currently, weight-bearing activities are recommended to stimulate bone formation due to the greater

magnitude of load that these activities apply to the skeleton. Activities that provide larger loads, such as weightlifting, volleyball, basketball, and gymnastics, produce a greater stimulus compared to endurance activities, such as distance running and triathlon. Variety in exercise modalities is a key to bone health.

Your bones, although they need high-impact loading, also need rest. Emerging

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evidence indicates that bone cells lose sensitivity to mechanical stimulation after a certain number of loading cycles and that recovery periods are needed to restore the mechanosensitivity. Animal studies have proposed that very few loading cycles are necessary to optimize bone formation. Furthermore, for a given number of loading cycles, multiple daily sessions are more beneficial than a single daily session. Therefore, you should exercise your bones multiple times per day for short durations.

Take Home Point: Short duration, high-impact exercise multiple times per day is optimal.

The Wrap Up

A *misconception* is defined as a view or opinion that is incorrect because it is based on faulty thinking or understanding. Exercise's effect on bone strength, although complex and age dependent, is not based on faulty thinking. Exercise is effective for bone strength development and healthy aging.

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Drink a Beer, View a Van Gogh, Exercise!

Terri Akman in the *Inquirer Daily News* reports that many museums and municipal park and recreation departments in Philadelphia are offering exercise opportunities outside the gym: doing yoga in the art gallery, exercising outside in the park, meeting friends and heading to the pub for a beer after the run.

While yoga in the museum may be good for your health, what about heading to the pub after your run? Is there any relationship—good or bad—between exercising and drinking? A study published in 2001 in the *Journal of Studies of Alcohol* looked at the relationship between alcohol consumption and physical activity. For the correlational study, the authors used data derived from over 40,000 participants who took part in the 1990 National Health Interview Survey. They found that individuals who self-reported drinking a couple of drinks a day were more likely to exercise.

A recent study by David E. Conroy and colleagues published in *Health Psychology* in 2015 and highlighted in a *New York Times* article by Gretchen Reynolds attempts to shed further light on the topic. These researchers recognized that reducing alcohol consumption and increasing physical activity are both important goals of Healthy People

2020. However, most previous studies have not examined these behaviors in the same individuals over time, and many studies have been limited to examining younger individuals. They therefore examined when (and how much) individuals age 18 to 89 years consumed alcohol and engaged in physical activity in their regular daily lives.

Data were drawn from a previous study by the researchers that included 150 adults who completed three 21-day “measurement bursts” over the course of a year. Participants visited the lab at the beginning and end of each measurement period and also had an app on their smartphones to record their daily drinking and exercise behaviors. Such a methodology is considered to be more accurate than having participants recall their behaviors over the past month (the typical procedure in many studies), and the intensity of assessment allows for consideration of how behaviors may differ on work days versus weekends.

The following are some findings suggested by the authors:

- This is the first evidence of a daily within-person coupling between physical activity (PA) and alcohol consumption across the adult life span. Results elaborated previous



cross-sectional findings that recent PA and alcohol use are positively associated.

- People drank more than usual on the same days that they engaged in more PA than usual.
- The daily within-person link between PA and alcohol use did not differ systematically across age or sex. Thus, it appears that the findings were not driven by younger or male participants, who tend to both engage in more PA and consume more alcohol.
- The link was driven largely by beer consumption and was uniform across the entire week, despite changes in the amount of alcohol consumed on the social weekend.

The authors concluded that further work

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must be conducted to identify the causal links between alcohol consumption and physical activity, but point to the possibilities for developing interventions that decouple individuals' tendencies to pair alcohol and exercise. In the meantime, go to the art museum for yoga class and drink your beer in moderation while keeping up your exercise!

–PMc

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Cover Up Those Mirrors When You Are Exercising!

A recent article by Courtney Perkes in the *Orange County Register* reports that many gyms in Southern California are removing their mirrors so exercisers cannot watch themselves. Mirrors in gyms became commonplace in the 1970s due to the popularity of bodybuilding, but now many of those mirrors are being removed or replaced with photos of outdoor environments. Evidence to support the claims that exercisers may feel better about themselves if they do not see themselves is not new. Jeffrey A. Katula

and colleagues at the University of Illinois published results in 1998 demonstrating that mirrors led to decreased self-efficacy for exercisers, especially females. Further research by Kathleen A. Martin Ginis and colleagues in 2003 also demonstrated that exercisers felt worse if they watched themselves in a mirror. So get in to yourself and your body and cover up those mirrors. They may be more interesting things to look at than yourself.

–PMc



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Going the Distance: Fitness Trackers and the 10,000-Step Goal

By Patrick Wade, KT Staff Writer

As more and more fitness trackers appear on the market, the people who buy them are finding motivation to step it up—literally.

And 10,000 steps, to be exact: Hit that number, the advertisements suggest, and you will be the picture of fitness.

According to a 2015 study, although only 1 to 2 percent of Americans had adopted fitness trackers, sales were projected to increase by more than \$50 billion by 2018. But one-third of people who purchase or receive a fitness tracker stop using it within six months.

That is why wearable devices should be a facilitator, not a driver, of behavioral change, according to the study's authors, from the Philadelphia VA Medical Center. "Most health-related behaviors such as eating well and exercising regularly could lead to meaningful improvements in population health only if they are sustained," the authors write. "If wearable devices are to be part of the solution, they either need to create enduring new habits, turning external motivations into internal ones (which is difficult), or they need to sustain their external motivation (which is also difficult)."

There's no doubt that increasing physical

activity has health benefits, but does the 10,000-step goal have merit?

"The 10,000-step number is an arbitrary cultural phenomenon," author and biomechanist Katy Bowman tells *Kinesiology Today*. "I imagine that someone in marketing realized that steps were less daunting than miles and that people like the idea of doing 10,000 of something, versus the three to five miles covered by those steps. Fewer would be motivated by doing three of something, I'd imagine."

And it's adequate for a one-size-fits-all approach, she added. "Given large sedentary habits . . . and the complexity of exercise dosage, the 10,000 steps seems like poor exercise prescription," Bowman said. "It's similar to a RD telling a patient they need to keep their calories below 1,200 a day, and no additional information. A simple numeric recommendation seems adequate in theory, but kinesiologists and movement teachers need to do better as



professionals."

The research on the benefits of 10,000 steps per day is nonetheless plentiful. Studies suggest that those who literally go the distance have lower blood pressure and better cardiovascular fitness. Walking can also fight COPD and lower the risk of diabetes.

Walking more can lower the risk of stroke in older men. Among 3,400 study participants in the United Kingdom, the more the men walked, the lower their risk for stroke. Men who walked four to seven hours per

week had a risk of stroke 11 percent lower than those who walked less. Risk of stroke was 64 percent lower in men who walked 22 or more hours per week.

In a survey of 550 COPD patients, a research team found that those who walked two to four miles per day were hospitalized only 53 percent as often as those without regular walking routines.

But, as with all kinds of exercise, walking may only have benefits to a degree. At some point, walkers will need to increase their activity.

“Walking can absolutely improve fitness in individuals who are less active,” Jinger Gottschall, an associate professor of kinesiology at Penn State University, told *Kinesiology Today*. “However, as fitness increases, the stimulus to raise intensity must also increase. Therefore, walking uphill or increasing your speed to a jog or run may be required to overload the system and continue to see benefits.”

That also means walking should be only the beginning for people who have not yet achieved a higher level of fitness.

“Walking is an ideal way to start exercising,” Gottschall said. “It does not require much money, equipment, or memberships. Ten thousand may be too many for some and too few for others. The most important thing is start moving more. Once an indi-

vidual can acquire 10,000 steps comfortably, the next step would be adding a different type of training, such as strength training or adding higher intensities, such as hills and speed. The goal is to continue to challenge yourself with activities you enjoy.”

Bowman does see a potential benefit of fitness trackers. “I do think that our sedentary habit is reinforced by our lack of awareness of it; thus movement trackers can help for those that depend on technology to measure such things,” Bowman said.

There are barriers, though, according to the Philadelphia VA Medical Center researchers. In a survey of fitness tracker users, 48 percent were younger than 35 years old. Twenty-nine percent earned more than \$100,000 annually—which is helpful when it comes to purchasing the relatively expensive devices. But the people who have most to gain from fitness trackers are likely to be older and less affluent.

If the devices are to effect any kind of real behavioral or fitness change in our society, the researchers suggest that new models are needed to make the devices more useful. Employers or insurers might offer incentives to make the devices more affordable, for example, and the device programmers themselves could offer rewards to make sustained use more likely.

So is 10,000 a worthwhile goal? If you

ask Gottschall, it's as good as any. “Any goal that helps an individual's motivation for physical activity is worthwhile,” Gottschall said. “I have seen many people begin their fitness journey with pedometers. Not only do you minimize hours of continual sitting, but you learn to explore the environment around you in order to accomplish your goal.”

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Get Your Blood Pressure Down—Get Outside!

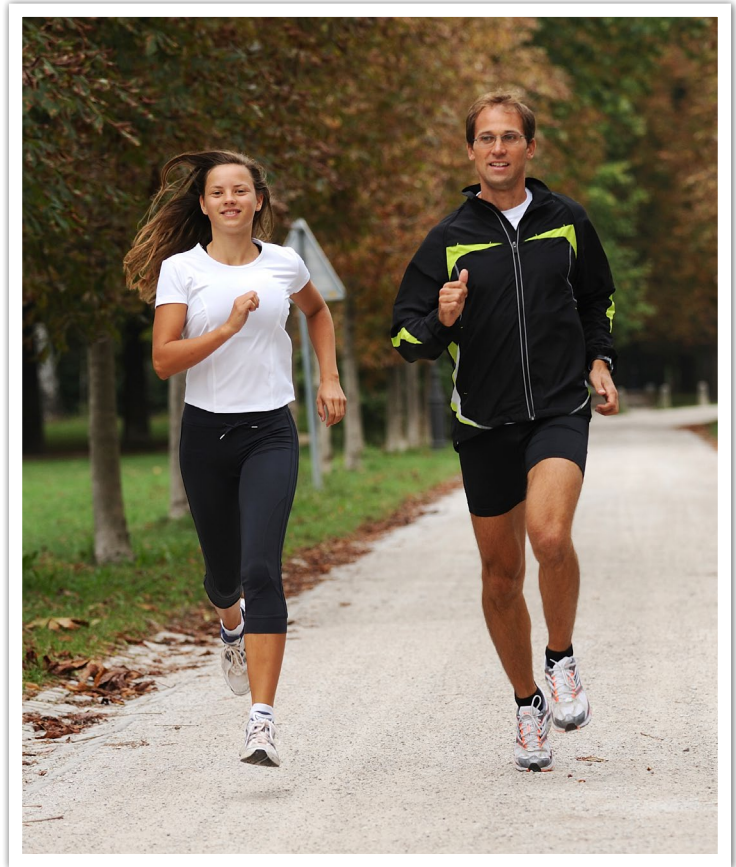
A long history of research shows that experiences in nature are linked to many positive outcomes. Studies show improved physical, mental, and social well-being when individuals engage with nature. This correlation has become a prominent issue in city planning—especially in high-density cities, where land costs are prohibitive. Researchers from the University of Queensland in Australia were interested in how the frequency and duration of exposure to nature was related to long-term health outcomes. One hypothesis was that higher levels of vegetation would lead to higher positive health outcomes.

Results indicated that the longer folks were in nature, the lower their depression and blood pressure and the more they moved. Being in green space also increased social cohesion. The most positive results were shown for individuals who spent 30 minutes or more visiting a green space.

The researchers recognize that their survey methodology has implications for determining causes. Nonetheless, it might be nice to get out of the office and go to your urban park!

—PMc

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I Wanna Hold Your Hand

Runner's World reported on 80-year-old Kay and Joe O'Regan from Ireland, who held hands as they finished a marathon on their 57th wedding anniversary and won in their age groups. Kay has finished 113 marathons, and Joe has completed 29. They held hands while finishing their first marathon in London in 1986, when they were 50! This time, at the Cork Marathon, they held hands for the last half mile. They finished in 5:25:29. Amazing! They have traveled around the world running marathons, and they helped support a running club in their hometown.

Kay and Joe just missed the Guinness World Record for oldest couple to finish a marathon, so let's keep an eye out and see if they do it again. Joe is quoted as saying "Never say never."

—PMC

Fox, K. (2016, June 21). Octogenarian couple finishes final marathon holding hands. *Runner's World*. www.runnersworld.com/general-interest/octogenarian-couple-finishes-final-marathon-holding-hands



Photograph courtesy of Cork City Marathon

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World Youth Fitness Comparison Study

By Amy Rose, KT Staff Writer

It's common knowledge that the physical fitness of youths in the United States has been steadily declining for several years. A recent study now shows that the United States is lagging dreadfully behind other countries when it comes to the fitness level of our children, which eventually correlates to reduced health in our adult population as well.

An international study led by the University of North Dakota (UND) and the Children's Hospital of Eastern Ontario (CHEO) studied the aerobic fitness level of children from 50 countries. The results, which were published in the *British Journal of Sports Medicine*, ranked American youths in 47th place. Other developed countries didn't fare so well either: Australia was ranked

35th, and Canada came in 19th overall.

The study centered around data that had been collected between 1994 and 2015 using the 20-meter shuttle test with children between the ages

of 9 and 17 years old. This included results from 1.1 million children across 50 countries. The 20-meter shuttle test seemed to be the most commonly used test throughout the world, although the results were often reported in different ways. So the research group developed an international fitness score as a way to compare the studies. They looked at country, gender, ages, and year of study to determine whether kids today are fitter than in the past and to ascertain where they are the most fit. The top five countries for fit youths turned out to be Tanzania, Iceland, Estonia, Norway, and Japan.

As mentioned, some of the wealthier and more developed countries didn't rank so well in the overall fitness of their young citizens. Grant Tomkinson, associate professor of kinesiology at UND and senior author of the study, said several factors stood out as affecting the recorded fitness levels, but the most telling was the socioeconomic gap in the population of the country. The larger the income inequality in a country, the lower the fitness levels became. A larger population of poor people equaled poor general health in the country and a higher

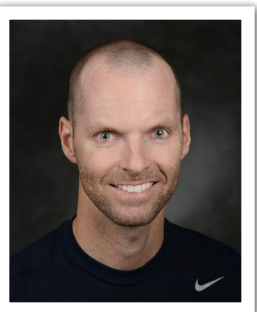
risk of cardiovascular risk and poor nutrition. "The United States is sitting at the bottom of the pack due to a large population of poor in contrast to the higher-level income population," Tomkinson explained.

What may be surprising is that places like Tanzania, which is considered a poor country, have superior fitness levels because of their lack of public transportation systems. Walking and biking are "a necessity in these places. Active transportation is a requirement," Tomkinson said.

Another obvious factor was the culture of physical education in schools. Estonia, which finished third, has a much higher commitment to physical education in the schools, as compared to the United States and Australia. "We do elite sports really well, but the others many times get left by the way side," Tomkinson pointed out.

Tomkinson says the results of the study should put some pressure on those lower-scoring countries to really start analyzing what can be done to change this. "America doesn't want to be left behind," he said. "We need to start to improve the health of our nation with children's health, which translates into adult health, and we might be

Continue on Page 17



Grant Tomkinson

standing in a better position in the future.”

From this study and the cooperation of many kinesiology and health researchers around the world, the group has formed the Active Healthy Kids Global Alliance (www.activehealthykids.org). The group has distributed physical activity report cards to 38 countries and is establishing an international aerobic activity database. Educators, policy makers, and health professionals can use the database to compare the results of tests that will be recorded each year. The alliance is also developing a recognized standard protocol for fitness reporting to collect fitness-based data for future use and comparison. They hope to distribute

physical activity report cards to 75 countries by the 2018-2019 school year.

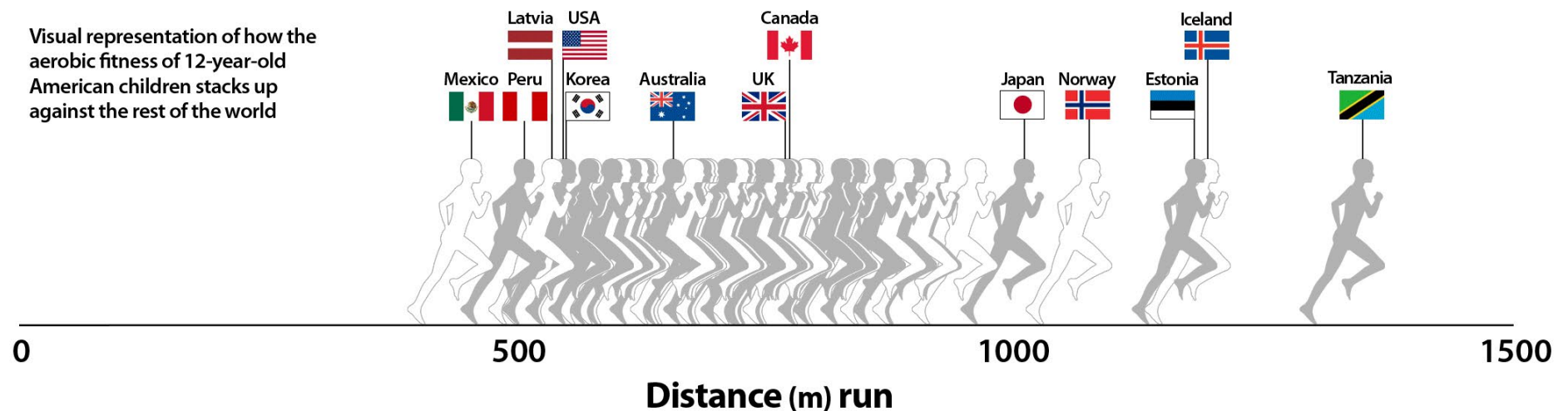
The alliance is looking for groups and individuals working with youths and the health care industry to champion their initiatives in each country. They are using more advertising and communication of the fitness facts gathered to get people on board, and they hope to use the data to help change global policies regarding youth fitness.

“Kids who are aerobically fit tend to be healthy; and kids who are healthy are apt to be healthy adults. So studying aerobic fitness in early years is very insightful to overall population health,” said Justin Lang,

the report’s lead author and a PhD student at the University of Ottawa. “It’s important to know how kids in Canada or America fare on the world stage, for example, because we can always learn from other countries with fitter kids.”

Lang, J.J., Tremblay, M.S., Leger, L., Olds, T., & Tomkinson, G.R. (2016). International variability in 20 m shuttle run performance in children and youth: Who are the fittest from a 50-country comparison? A systematic literature review with pooling of aggregate results. *British Journal of Sports Medicine*. doi:10.1136/bjsports-2016-096224

Visual representation of how the aerobic fitness of 12-year-old American children stacks up against the rest of the world



Do All Foods Cause Cancer?

A recent article by Gina Kolata in the *New York Times* suggests that all we have been fed about food and exercise may not be quite what we should believe. Although hundreds of studies related to exercise and nutrition are published weekly, she suggests that these findings may be weak compared to those that link smoking and lung cancer.

She cites Dr. Barnett Kramer (director of the National Cancer Institute's division of disease prevention), who states, "You can ask people how many times a week or month they eat bread or berries or you can ask them to keep a diary of what they ate in the last 24 hours . . . but it should be no surprise that people misremember or give researchers an answer they think makes them sound good." If much of the research is based on this sort of data, then it becomes suspect.

Dr. Kramer suggests that the research is "whipsaw literature" since one week certain foods are good for you and the next they are not. There is also the suggestion that researchers may overemphasize some of their findings and that there have been few large-scale highly controlled studies on lifestyle.

Jonathan D. Schoenfeld and John P.A. Ioannidis, researchers from Harvard Medical School and Stanford Prevention Research Center, did an interesting study on diet. They examined a popular cookbook and randomly selected recipes from the book and the listed the ingredients. They then reviewed the literature to determine which of the 50 ingredients were linked to cancer. Forty of the ingredients had been reported to be linked with cancer. Of the 264 assessments, 191 of the studies concluded that the food was associated with increased cancer, while 88 showed a decrease. When they conducted a meta-analysis, the results were far more subdued. Only 4 reported an increase in cancer risk, and 9 reported a decrease. An interesting finding was that significant results (that is differences) were likely to be reported in abstract, while nonsignificant results (no differences) were not. Dr. Kramer suggests that researchers need to be a little more modest on how they report their results.

In the article, Dr. Berry, who is a member of the board of the Physician Data Query for the National Cancer Institute, suggests that no foods are associated with cancer.



While the board would like to make some statements about whether diet affects cancer, they do not feel they have sufficient evidence to make any claims.

—PMC

Kolata, G. (2016, Aug. 11). We're so confused: The problems with food and exercise studies. *New York Times*. www.nytimes.com/2016/08/11/upshot/were-so-confused-the-problems-with-food-and-exercise-studies.html?_r=0

National Cancer Institute. PDQ—NCI's comprehensive database. www.cancer.gov/publications/pdq

Schoenfeld, J.D., & Ioannidis, J.P.A. (2013). Is everything we eat associated with cancer? A systematic cookbook review. *American Journal of Clinical Nutrition*, 97(1), 127-134.

Train Low, Compete High? Fasting Before Exercise May Be Good

Patrick Wade, KT Staff Writer

While high-intensity interval training has long been considered a proven strategy to improve both aerobic and anaerobic endurance, emerging evidence suggests that fasting before activity may be one way to make sure you are getting the most out of your workout.

The findings in a number of studies contradict traditional wisdom that training is best completed with normal to high carbohydrate levels. According to a review by Pim Knuiman and colleagues of the research published in *Nutrition & Metabolism*, engaging in high-intensity workouts while glycogen levels are low may enhance the capacity for muscles to oxidize fat and generate energy.

While it is widely known and accepted that carbohydrates are the fuel for a single, prolonged workout or endurance activity, research is beginning to show that withholding carbohydrates in advance of training sessions may not affect performance and help to burn fat more efficiently. And some studies do not rule out the possibility that it may actually improve performance over time.

“Indeed, several studies have reported that endurance exercise with low glycogen

availability may be a strategy to augment the response in exercise-induced signaling associated with improved oxidative capacity . . . and potentially enhance exercise performance,” according to the review authored by Pim Knuiman, Maria T. Hopman, and Marco Mensink of Wageningen University in the Netherlands.

Here’s what some of those studies have shown:

- In one study, 14 well-trained cyclists performed nine high-intensity training sessions and nine aerobic training sessions—some with high-glycogen levels at the time of the workouts and others with depleted glycogen levels. During the study period, time trial performance improved by about 10 percent for both groups, and fat oxidation increased in the low-glycogen group, “which may have been due to the enhanced metabolic adaptations in skeletal muscle,” according to the study’s authors.
- In another study, 23 “recreationally active men” in three groups completed a 24-week training regimen of high-intensity running. Two groups started training sessions with glycogen levels depleted by 35 to 40 percent after consuming a low-carb lunch, but one of those groups consumed a glucose supplement immediately before and during exercise. The third group completed training under normal conditions, and all three groups reverted to their habitual diet on nonactivity days. The low-glycogen group that did not receive a supplement showed increases as high as 70 to 76 percent in oxidative activity in their leg and thigh muscles following the training regimen, whereas the other groups showed gains between 17 and 53 percent—although the increased oxidative activity did not translate to better performance.
- In a third study, 20 young men took up cycling for six weeks; half of them worked out after missing breakfast, and the other half worked out 90 minutes after eating a carbohydrate-rich breakfast. Gains in performance were nearly identical in the two groups after the training regimen,

and the ability to oxidize fat was nearly 21 percent higher in the low-carb group. But again, the difference did not translate to enhanced performance; the study's authors suggest that the reason may be that the training itself did not subject the athletes to the intensity of a real-life competition.

The authors of the review say there are still some unknowns. For example, the body of research is not clear on how glycogen levels affect fat oxidation or energy levels in highly trained athletes versus novices, and in different kinds of exercise. Training parameters like time, intensity, and frequency varied widely from study to study.

Notably, the majority of the research shows no difference in performance gains between low- or high-glycogen training regimens. In some, performance gains were less pronounced in the low-glycogen groups compared to those training under normal conditions.

While further research certainly is needed, the authors say there may be something there. "[T]he low glycogen approach seems promising with regard to the adaptive response following exercise," the authors write. "Therefore, low glycogen training may be useful as part of a well-thought out periodization program."

Knuiman, P., Hopman, M.T., & Mensink, M. (2015). Glycogen availability and skeletal muscle adaptations with endurance and resistance exercise. *Nutrition & Metabolism*, 12(1).

Hulston C.J., Venables M.C., Mann, C.H., Martin, C., Philp, A., Baar K., & Jeukendrup, A.E. (2010). Training with low muscle glycogen enhances fat metabolism in well-trained cyclists. *Medicine & Science in Sports & Exercise*, 42(11), 2046-2055.

Morton, J.P., Croft, L., Bartlett, J.D., Maclaren, D.P., Reilly, T., Evans, L., et al. (2009). Reduced carbohydrate availability does not modulate training-induced heat shock protein adaptations but does upregulate oxidative enzyme activity in human skeletal muscle. *Journal of Applied Physiology*, 106(5), 1513-1521.

Van Proeyen, K., Szlufcik, K., Nielens, H., Ramaekers, M., & Hespel P. (2011). Beneficial metabolic adaptations due to endurance exercise training in the fasted state. *Journal of Applied Physiology*, 110(1), 236-245.

You Can't Sit Around Just Because You Exercise

Most people are aware that exercise is good for you and that sitting too long is bad. But what if those dedicated exercisers get up and take their early morning run and then go to the office and sit down for extended periods of time? Are they immune to the negative effects of prolonged sitting?

The answer is probably not! While there have been numerous correlational studies suggesting that exercise may help reduce the effects of prolonged sitting, the jury is still out. Il-Young Kim and colleagues reviewed previous studies that had suggested that exercising for 75 minutes might alleviate the increased mortality rates associated with sitting. However, Il-Young Kim claims that they could not identify experimental studies

(that would provide stronger evidence) to support this claim.

Their hypothesis was that after prolonged period of sitting, exercise will not show its beneficial effects. They created three experimental conditions and controlled diet. They found that sitting for long periods of time was not good, even if people exercised.

So get up in the morning and exercise, and then be sure you get up and about during the day as well.

–PMC

Kim, I.-Y., Park, S., Chou, T.-H., Trombold, J.R., & Coyle, E.F. (2016). Prolonged sitting negatively affects the postprandial plasma triglyceride-lowering effect of acute exercise. *American Journal of Physiology: Endocrinology and Metabolism*, 311(5), E891-E898. DOI: 10.1152/ajpendo.00287.2016



NPAP Alliance Releases 2016 U.S. Report Card on Physical Activity for Children and Youth

By Jason R. Carter, AKA Board Member of the NPAP Alliance

The National Physical Activity Plan (NPAP) is based on a simple, yet powerful, vision—that one day all Americans will be physically active by living, working, and playing in environments that encourage and support regular physical activity. The plan outlines several policies, programs, and initiatives that support this vision of America. The latest version of the plan, updated in 2016, recognizes a complex physical activity behavior model that intersects with nine key societal sectors:

1. Business and industry
2. Community recreation, fitness, and parks
3. Education
4. Faith-based settings
5. Health care
6. Mass media
7. Public health
8. Sport
9. Transportation, land use, and community design

Over the past few months, I have been transitioning to the NPAP Alliance board of directors as the AKA-designated board member. My AKA predecessor, Wojtek Chodzko-Zajko of the University of Illinois at Urbana-Champaign, was involved in the latest NPAP update in 2016 and served the NPAP Alliance well. On behalf of the AKA membership, as well as the NPAP Alliance, I want to thank Wojtek for his service and commitment to the NPAP over the past few years. I am humbled to have the opportunity to build upon Wojtek's contributions to the NPAP Alliance, and I hope to represent AKA strongly in this important national initiative.

The most recent initiative to come from the NPAP Alliance is the 2016 U.S. Report Card on Physical Activity for Children and Youth (released November 16, 2016). The primary goals of the report card were to assess (1) levels of physical activity and sedentary behaviors in American children and youth, (2) facilitators and barriers for physical activity, and (3) health outcomes related to physical activity. Using data from nationally recognized surveys (National

Health and Nutrition Examination Survey, Youth Risk Behavior Surveillance System, National Youth Fitness Survey, etc.), the NPAP research advisory committee developed a scoring rubric and graded several key areas related to physical activity in America's children and youth. The following are the assigned grades:

Category	Grade
Overall Physical Activity Levels	D–
Sedentary Behaviors	D–
Active Transportation	F
Organized Sport Participation	C–
Active Plan	I
Health-Related Fitness	D
Family and Peers	I
School	D+
Community and Built Environment	B–
Government Strategies and Investments	I

I = incomplete grade due to lack of data

Several key findings and statistics shaped each grade. For example, the category of Overall Physical Activity Levels was defined as the “proportion of U.S. children and youth attaining 60 or more minutes of moderate-

to-vigorous activity on at least 5 days per week.” As outlined in the full report, there is evidence documenting that this level of physical activity is prevalent in only 43 percent of youths ages 6 to 11, 8 percent of youths ages 12 to 15, and a mere 5 percent in youths ages 16 to 19. A key statistic underlying the F grade for Active Transportation was the fact that only 13 percent of children ages 5 to 14 typically walk or bike to school. You can see that

we have major work to do!

For a full description of the 2016 U.S. Report Card on Physical Activity for Children and Youth, visit the following site:

www.physicalactivityplan.org/projects/reportcard.html

Lastly, I encourage all of you to not only check out the 2016 report card, but to also review the National Physical Activity Plan to learn more about the challenges and opportunities that exist with the vision of a

physically active America. The plan outlines several key strategies and tactics that might be considered in building a more physically active and healthier nation. The full plan can be accessed via the following site:

http://physicalactivityplan.org/docs/2016NPAP_Finalforwebsite.pdf

Fingers Together or Fingers Apart? What Is Better for Front Crawl?

Evidence by researchers from the Netherlands (reported at the American Physical Society meeting in November 2016) indicates that swimming efficiency is increased by spreading the fingers. The authors suggest that claims have previously been made about the benefit of spreading the fingers but argue that no convincing evidence had been presented. So the researchers

built and printed a 3-D model of the hand and tested it in wind tunnels and through computer-based simulations. Their findings? “Spreading the fingers gives a small efficiency advantage by obstructing flow with the spaces created between spread fingers. This increase in drag also increases thrust. The higher the drag coefficient, the more efficient the pull.”

While the increase in performance was small, a small difference can mean the difference between winning a silver medal and taking home the gold.

–PMc

American Institute of Physics (AIP). (2016, Nov. 21). Paddle or rake to improve your swimming stroke? [ScienceDaily](http://www.sciencedaily.com/releases/2016/11/161121090711.htm). Retrieved January 7, 2017, from www.sciencedaily.com/releases/2016/11/161121090711.htm

EDITOR'S ONE CENT WORTH

Share Your Ideas With Us and Share KT With Others*By Penny McCullagh, KT Editor*

Penny McCullagh

Well, another year has come and gone. I completed four issues of KT in 2016, and it has been an adventure. At AKA we are still working on trying to get more people to engage with KT. I urge you

to use it in your classes, share it with parents, and share with other colleagues. If you would like a research focus from your department, please send it along—we would like to highlight AKA members.

Please send along ideas of how you might use KT in your classes. Here is one example.

Sample Class Exercise for Students

Go to the American Kinesiology Association website (www.americankinesiology.org) and do one or more of the following exercises:

1. Go to the Publications dropdown menu and select *Kinesiology Today*. Examine one issue of KT from 2008 through the present issue. Pick one article that sparked your interest. Give the title and the exact issue (e.g., fall 2014) and page number, and write a two- to three-line summary of the article.
2. As you look through KT, give at least two examples of how you might use this publication in your profession.
3. Go to the Events & Services dropdown menu; select AKA Awards > Scholar Awards. Find criteria for getting nominated for the AKA award for your level of study (undergraduate, masters, or doctoral). Do you think you would be eligible? Why or why not? Clearly refer to at least two criteria. If you are eligible, please let your faculty know so you can get nominated.
4. Go to the Career Center dropdown menu. Select Featured Careers. Pick two careers that you were not very much aware of and tell us why a kinesiology major might be good at such a career.
5. Share *Kinesiology Today* with a family member or friend who is not very aware of the field. Let them browse through an issue, and then ask them to identify one story that they could read and share with other friends or family. Did they learn anything new about the field of kinesiology?

Contact me at kintodayaka@gmail.com if you have any great ideas!

Executive Director's Report

By Amelia Lee, AKA Executive Director

Nominate Your Students for the 2017 Scholar Awards

Each year, the AKA recognizes and focuses attention on member departments' most exceptional students, and it is time to send in your nominations. Scholar Awards are given in four categories: Undergraduate Scholar, Master's Scholar, Doctoral Scholar, and the Graduate Student Writing Award. The deadline for the 2017 nominations is March 1, and the specific criteria for these awards can be found on the AKA website: www.americankinesiology.org. The awards committee will review the nominations and select the national winners. All nominees from member institutions will receive a certificate of recognition, and the Scholar Award recipients will also receive a \$250 gift certificate from Human Kinetics. Pictures of the winners will be posted on the AKA website.

Nominate Your Colleagues for the 2017 Distinguished Leadership Awards

The AKA also recognizes outstanding leaders in administrative units at member institutions, and it is time to send in nominations for these awards. Up to four awards are given each year, based on the kind of degrees granted by the institution: doctoral, masters, undergraduate, and associate degrees. The award criteria and all other nomination information can be found on the AKA website: www.americankinesiology.org. The deadline for award nominations is April 30, 2017.

Official Position Statements and Perspective Publications

The executive committee has recently approved a set of policies and procedures for the development of papers that are related to kinesiology as an academic discipline; the procedures offer recommendations for a course of action that reflects AKA's stance regarding this important

issue. After a thorough review, papers will either be submitted for publication in *Kinesiology Review*, considered for publication in *Kinesiology Today*, or posted on the AKA website. More information will be available soon.

AKA Is Growing in Numbers

One of our major goals has been to increase the number of academic departments or schools participating in AKA and to try to achieve a balance between small, medium, and large units. This past year, thanks to the work of our membership committee, some progress has been made in these areas. We now have 160 members, up from 138 in 2014 and 151 in 2015.

Welcome to our newest members:

- Southwestern University
- St. Mary's College of California
- University of Toronto
- Winston-Salem State University

AKA ANNUAL WORKSHOP

Advantages and Challenges of Partnerships and Relationships

by Thomas J. Templin, University of Michigan, AKA President

As I assume the presidency of the American Kinesiology Association, it is my pleasure to write about our recent annual leadership workshop held in Dallas from January 26 to January 29. The association owes Phil Martin and President Mary Rudisill a debt of gratitude for organizing the workshop, titled Advantages and Challenges of Partnerships and Relationships. Equal thanks go to Sandy Schultz and Jason Carter for overseeing our preworkshops on athletic training and graduate education, respectively. A special thanks to our executive director, Amelia Lee, and past president, Duane Knudson, for their counsel in helping to shape the conference. Finally, as always, we are especially grateful to Kim Scott from Human Kinetics for her wonderful logistical expertise and pleasant demeanor throughout the meeting.

While some of our preworkshop attendees learned a great deal from Russ Richardson about the prospect of changes in athletic training education, others profited from the expertise of Ketra Armstrong, Steve Eimer, Karen Meaney, Ting Liu, and Jared Russell on emerging trends in graduate education.

One hundred and four participants representing 75 institutions attended our

major program, which centered on partnerships and collaborations on and off campus. Through keynote presentations (Frank Ascione, Gayle Hutchinson, and Tim Moore) and panel and roundtable presentations from nearly 70 presenters, our attendees learned a host of lessons about creating effective partnerships that not only benefit each partner but also serve the clientele across the life span in a variety of contexts. We learned how research is generated from these initiatives to provide insights into the efficacy of these unions. Most importantly, we learned about the importance of partnerships that result in meaningful and ongoing efforts to promote diversity, equity, and inclusion.

We learned that social, organizational, and partnership capital is generated, whereby long-term relationships are created from the knowledge, skill, and dispositions of those leading programs. Trust, caring, respect, leadership, communication, and a host of other positive attributes and strategies from project champions and other contributors all combine to produce positive collaborations. A number of exemplars were provided in each and every presentation.

Thanks to all those who attended this

most gratifying meeting. I look forward to the publication of a variety of manuscripts in *Kinesiology Review* that will illustrate the wonder of the multitude of partnerships at the meeting. I look forward to seeing you in January 2018 at our next meeting in Denver, Colorado.

SAVE THE DATE

2018 AKA Workshop

January 25-28, 2018

Marriott Denver Airport at Gateway Park

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