

An Examination of the Role of Physical Education as a Determinant to Continued and Lifelong
Physical Activity in Females

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ABSTRACT

This synthesis examined a critical mass of research to identify significant determinants of continued physical activity in females across the lifespan. More specifically, a central aim of this project was to examine physical education programming as a one of these determinants and examine the potential avenues for educators to instill lifelong involvement for female participants. Literature was used to create themes such as youth participation, physical activity across the life span, gender differences, ethnic and economic determinants of lifetime participation, attitudes and perceptions of physical education and physical activity, physical activity preferences, and physical education as an indicator / promoter of lifelong physical activity. Based on a synthesis of the literature, the following list of recommendations as well as a “Yearly Student Influenced Curricular Plan of Action” was developed in order to increase the likelihood of continued involvement outside and after the influence of physical education programs: (1) programs should increase focus on achievement in the “affective domain” (50% or greater), (2) provide students with a student-selected, choice curriculum based on more non-traditional activities, (3) ensure that each activity has a focus that female students especially find meaningful and enjoyable and can access outside of the classroom, individually, and at least potentially across the lifespan, (4) ensure a safe and success oriented environment sensitive to females and accepting of a variety of attitudes, perceptions and backgrounds, and (5) provide a genuine reflection process at the end of each class session or unit to assess whether or not student attitudes and perception toward course activities are remaining positive and influential.

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CHAPTER 1

INTRODUCTION

The purpose of this synthesis is to examine a critical mass of literature pertaining to the continuation of health enhancing physical activity levels in females from youth to adulthood and across the lifespan. More specifically, the central goal of this paper is to determine the influence and role of physical education as a determinant of such lifelong participation in physical activity. Further, this paper will seek to determine what evidence (if any) exists within the critical mass of research to determine if physical education programs are “on track” with promoting lifelong health and physical activity. Finally recommendations to enhance physical education to better ensure healthy lifetime physical activity behaviors in females throughout the lifespan are provided to impact current practices or to stimulate future research on gender sensitive physical education programming.

Background

It is important to the completeness and full understanding of the focus of this synthesis to first identify those additional underlying roots and factors that exist amongst the research related to physical activity patterns across the lifespan. Throughout the research and literature examined, there evolved a re-occurring and common set of themes and potential related contributors accompanying physical education as a determinant toward lifetime physical education (Bragg et al. 2009; Broderson et al., 2007; Butt et al., 2011; Engstrom, 2008; Hawkins et al., 2009; Kimball, Jenkins, & Wallhead, 2010; Kjonniksen, Fjortoft, & Wold, 2009; Larouche et al., 2012; Makinen et al., 2010; Matton et al., 2006; Trudeau, Laurencelle, & Shephard, 2004; Yang et al., 2007; Zimmerman-Sloutskis et al., 2010). This background section will include sections on aims

of physical education, physical activity, gender related trends, motivational factors and additional / related determinants (race, culture, gender, age and socio-economic status).

Aims of Physical Education

The ultimate role and duty of an educator is to provide students with the knowledge, tools and skills necessary to utilize and apply throughout various aspects of life (National Education Association, 2014; Ennis, 2010). Physical Educators in particular, have the potential to influence the development of a very critical aspect – a healthful, physically active lifestyle. In fact, among the most significant of the National Association for Sport and Physical Activities’ standards for Physical Education is the highlighted “focus on guiding students’ ...toward the value of physical activity in physical education and throughout their lives” (Ennis,2011). Although, the ideal of delivering a Physical Education program that ensures lifelong health, wellness and physical activity may be a central focus of state and national standards, there is an obvious gap in the transition out of current programs as various studies have indicated a decline in physical activity across the lifespan, especially in females (Larouche et al., 2012; Matton et al., 2006).

Both in the initial development decades ago as well as today, the NASPE standards for physical education have highlighted the ultimate goal to “develop physically literate individuals who have the knowledge, skills and confidence necessary to enjoy a lifetime of physical activity” (National Association for Sport and Physical Education & American Alliance for Health Physical Education, Recreation and Dance, 2014). The influence of this all-encompassing goal therefore is meant to be thoroughly practiced and emphasized through the incorporation of each of the following standards.

Standard 1: Demonstrates competency in motor skills and movement patterns needed to perform a variety of physical activities.

Standard 2: Demonstrates understanding of movement concepts, principles, strategies and tactics as they apply to the learning and performance of physical activities.

Standard 3: Participates regularly in physical activity.

Standard 4: Achieves and maintains a health-enhancing level of physical fitness.

Standard 5: Exhibits responsible personal and social behavior that respects self and others in physical activity settings.

Standard 6: Values physical activity for health, enjoyment, challenge, self-expression, and/or social interaction

(National Association for Sport and Physical Education & American Alliance for Health Physical Education, Recreation and Dance, 2014)

By the time students reach commencement, every student (male and female) is expected to have the competency to achieve and continue the promise of each of these standards across the lifespan. Based on a great deal of research however, it is obvious that such may not be the case (Ennis, 2010; Hawkins et al., 2009; Bert, 2013, Trudeau & Shephard, 2005).

Physical Activity

The majority of research related to physical activity across the lifespan reflects an age related decline. According to the results and various follow up studies to the Trois-Rivieres Study for example, there exists a clear “waning of physical activity from childhood to adulthood” (Larouche et al., 2012). Larouche et al. (2012) specifically and examined four of the major “transitional periods” including “adolescence, the beginning of post-secondary education, entry into the labor market and parenthood.” Results concluded a “progressive, non-linear decline of PA [physical activity]” from adolescence through middle age (Larouche et al., 2012).

Even within the adolescent years, there is a clear “drop off” in physical activity participation found in the research literature (Butt et al., 2011). Butt et al. (2010) examined how interest levels and preferences in activity types are common of this life period and therefore a key stage to “structure activities differently to sustain interest” in hopes of continuation on into adulthood. By pinpointing the determinants as to why such a decrease in physical activity exists among each of these major life stages therefore (particularly within the adolescent stage), physical educators would have a greater opportunity to prepare students to adapt to maintain physical activity.

Gender Related Trends

Females in particular, according to research tend to be the most vulnerable to such an age related decline. Even within adolescence, as Butt et al. (2011) examined, participation in physical activity decreases as females get older. Further, according to an objective study measuring physical activity of American adults by sex, age and racial / ethnic groups as well, “men [are] more physically active than women across all age groups” (Hawkins et al., 2009). In a discussion related to gender within the Larouche et al. (2012) study which identified the four life transitional periods of “adolescence, the beginning of post-secondary education, entry into the labor market and parenthood” also concluded that males were significantly more active than their female counterparts across each of the four life stages. An additional study conducted on the tracking of physical activity in females from youth to adulthood further examined the potential explanation for this decrease as a relation to “children in the household” therefore motherhood as a major time constraint playing into such a decline as well (Matton et al., 2006). Clearly, with the majority of the trends and research foci suggesting that females in particular show lower rates of physical activity, there is a great need to determine and adapt for a way to increase participation in this population.

Motivational Factors

Additionally, on a more personal and specific level, motivational factors including perception, attitude, preference, and past experiences are also key determinants with a tremendous potential to influence the practice of physical activity across the lifetime. The literature suggests that experiences in sport, physical activity or physical education (whether they be positive or negative) in youth can have a significant impact on the decision to continue participation both later into youth and adolescence on into adulthood (Butt et al., 2011; Kimball et al., 2010; Kjonniksen et al., 2009; Trudeau & Shephard, 2005). Further studies examine that youth participation in physical activity on its own is a motivating and influential factor and predictor of continued activity across the lifespan (Kjonniksen et al., 2009). Clearly, motivational factors and personal determinants such as these play a great role in the continuation of physical activity across the lifespan therefore the ability to shape and mold the most positive perceptions at a young age is critical as well.

Additional / Related Determinants

Finally, in addition to physical education as a potential and significant determinant of the continuation of lifetime physical activity, it is important to understand and identify additional significant factors that can play into these rates as well. Those most commonly examined throughout the literature include race, culture, socioeconomic background, age and of course gender. Among race and culture within itself, research has shown a difference in overall levels of physical activity. The majority of research generalizes that Caucasians are more likely to participate in higher levels of physical activity than other ethnic groups (black, Hispanic etc.) (Bragg et al., 2009; Broderson et al., 2007). In relation to socio-economic status as well, the literature generally concludes that those of lower status do not participate in as much physical

activity across the lifetime as those of higher status (Broderson et al., 2007; Engstrom, 2008). As previously recognized throughout the background explanation of the “age related decline” as well, it is no surprise that as individuals get older physical activity rates generally decrease. Finally, a determinant especially important to the focus of this paper, gender, is a clear determinant of physical activity levels and participation across the lifetime. The majority of literature and research related to the focus of this synthesis highlights an obvious difference between physical activity participation rates of male and females across the lifespan. The common consensus of the literature reflects that males have a higher rate of participation in physical activity across all stages of the lifespan (Hawkins et al., 2009; Larouche et al., 2012). Overall, the thorough understanding and consideration of each of these determinants especially gender as this paper focuses on females, are extremely important to the development of this synthesis and will help to formulate those recommendations for future physical education practices.

Definition of Terms

It is important for the thorough understanding of this synthesis to comprehend the functional definitions of keywords that will be found throughout related to the topic of Physical Education as a determinant of lifelong physical activity in females.

Determinant of Physical Activity. In relation to this paper, a determinant of physical activity can be defined as any potential factor that can play into one’s motivation, likeliness or unlikeliness to participate in physical activity. Those commonly referred to throughout this paper include race, culture, socioeconomic background, age, gender, and motivational factors including perception, attitude, preference, and past experiences related to physical activity.

Lifelong Physical Activity. For the purposes of this synthesis, lifetime physical activity refers to the continuation of participation and practice in physical activity beyond the school years and outside of the influence of physical education.

Quality Physical Education. Quality physical education for the purpose of this paper can most appropriately be defined through NASPE's definition as a program that develops "physically literate individuals who have the knowledge, skills and confidence to enjoy a lifetime of healthful physical activity" (National Association for Sport and Physical Education & American Alliance for Health Physical Education, Recreation and Dance, 2014).

"Stages" of the Life Cycle. The stages of the life cycle will be discussed in two different ways throughout this paper. First, the majority of the literature examines and pertains to the basic life stages of adolescence, young adulthood, middle and older adulthood. Second, Larouche's four "transitional periods" (or stages) including "adolescence, the beginning of post-secondary education, entry into the labor market and parenthood" will be referred to and cited throughout (Larouche et al., 2012).

Health Enhancing Physical Activity. Throughout this paper, a health enhancing level of physical activity can be best defined as the practice of physical activity at a level that encourages and yields health and wellness. In addition, this term encompasses one of the key goals of a quality physical education program.

Objective Physical Activity. Some of the literature utilized throughout this paper reflects the use of objective research methodology to measure rates and physical activity patterns in their subjects (observation, accelerometer use etc.).

Self-report Physical Activity. While many of the studies examined throughout the literature may reflect the use of objective measures to gain insight on rate and physical activity

behavior patterns, studies that utilized self-report methodology for data collection will also be utilized to supplement and support objective findings.

Summary

This synthesis proposes to examine if there is a clear connection between the potential of physical education programs and lifelong physical activity in females. The research has indicated that there are a number of additional determinants (in addition to physical education) discussed that may be contributing factors toward continued involvement in physical activity across the lifespan (Bragg et al., 2009; Broderson et al., 2007; Butt et al., 2011; Engstrom, 2008; Hawkins et al., 2009; Kimball et al., 2010; Kjonniksen et al., 2009; Larouche et al., 2012; Makinen et al., 2010; Matton et al., 2006; Trudeau et al., 2004; Yang et al., 2007; Zimmerman-Sloutskis et al., 2010). Throughout the course of this paper each determinant will be thoroughly examined.

CHAPTER 2

METHODS

The critical mass and additional supplemental articles for this paper were selected using four central database search engines. Such key databases included SPORTDiscus, Physical Education Index, MEDLINE as well as Google Scholar. All articles selected to be included into the critical mass were limited to research based literature. In order for an article to be used in this synthesis, each study had to meet the following list of criteria:

- 1.) A connection to physical education as a determinant.
- 2.) The article had to be peer reviewed.
- 3.) The article had to include at least some information directly generalizing to female participants.
- 4.) A relation to participation in physical activity and / or related determinants.

Studies by Bragg et al. (2007), Broderson et al. (2007), Kjonniksen et al. (2009), Larouche et al. (2012), Matton et al. (2010), and Trudeau et al. (2004) were retrieved using the SPORTDiscus database search engine. The key words, “physical activity,” “lifetime” and “physical education” were used in the search process and yielded 192 results. After refining the search to peer reviewed, full text, and limiting the publication date to within the last 10 years (2004-2014), 62 results matched the criteria. From these 62 results, studies by Kjonniksen et al. (2009) and Larouche et al. (2012) were selected and used in this study. Next, the search words “physical activity” and “females” were run through the search engine which returned 1,373 initial results. After again limiting the search to full text, peer reviewed, within the last 10 years and adding the additional key term “determinants,” the search engine presented 41 results. From these 41 results, studies by Bragg et al. (2007), and Broderson et al. (2007) were selected to be

referenced throughout this study. Finally, the search was refined once more and the key words changed to “physical activity” and “life stages” which when limited to full text, peer reviewed and within the past 10 years, produced 76 results. From those 76 results, studies by Matton et al. (2010) and Trudeau, et al. (2004) were selected and used within the critical mass in this study.

Studies by Butt et al. (2011), Hawkins et al. (2009), Makinen et al. (2010), and Zimmerman-Sloutskis et al. (2010) were retrieved from the MEDLINE database search. First, the key words “physical activity,” “women” and “physical education” were entered into the search which returned 3,003 results. After condensing the search to include only articles peer reviewed, full text and written within the past 10 years (2004-2014), the database yielded 965 results. Still looking to condense the search even further the key words were changed slightly to include “physical activity in females” and “physical education.” This modification presented 173 results from which the study by Butt et al. was selected and used as part of the critical mass in this study. Next, to narrow the search even further from the 173 previous results, the term “physical education” was replaced with “determinants producing 37 results. From those 37 studies presented, studies by Makinen et al. (2010) and Zimmerman-Sloutskis et al. (2010) were selected, used and included in the critical mass for this study. Finally, in order to have a better understanding of an objective measure of physical activity rates across different populations, the key words “physical activity rates,” “objective measures” and “race” were used in the search which produced 49 results. From this list of 49 results, the study by Hawkins et al. (2009) was selected and utilized within the critical mass in this study.

Studies by Bert (2013), Ennis (2010), Ennis (2011), Kimball et al. (2010), and Trudeau and Shephard (2005) were selected from the Physical Education Index database search engine. The first key words entered into this data system were “physical education,” “physical activity,”

and “lifetime” which initially yielded 369 results. After limiting the search to full text, peer reviewed and written within the past 10 years, the search presented 189 results. From this result list, the study by Kimball et al. (2010) was selected, included and used within the critical mass of this study. This same search also yielded non-research based however very useful supplemental articles by Ennis (2010), Ennis (2011), and Trudeau and Shephard (2005). Next, in order to gain the background knowledge on the production and selection of the NASPE standards and their relation to the lifetime component of physical education, the key words, “NASPE standards” and “lifetime” were entered into the search yielding 26 results. From those 26 results an additional supplemental, non-research based article by Bert (2013) was selected and used however not within the critical mass of this study.

Studies by the National Association for Sport and Physical Activity and American Alliance for Health Physical Education, Recreation and Dance (2014), Engstrom (2008) and Yang et al. (2007), were collected from Google Scholar. The unique aspect of the search on this particular system is that full names of articles were directly entered into the system. The full names of articles as well as their authors were selected directly from the reference list of articles previously selected and mentioned that were included in the critical mass. Each of these articles proved extremely helpful, met the search criteria and were selected to be used within the critical mass for this study.

Finally, after a careful selection of research it should be mentioned, that the critical mass includes studies that utilized self-report methodology as well as those that utilized objective measures for data collection. It was ensured that those articles utilizing self-report methodology yielded congruent results and supplemented articles utilizing objectively based measures and methodology in order to increase validity. Overall, the search process and selection of articles

used as either part of the critical mass or as supplemental, supportive research, fit all of the above listed criteria for this study and proved extremely useful in the development of this paper.

CHAPTER 3

RESULTS

The purpose of this section is to report the findings from the critical mass of literature. These results will be organized around the following themes and headings: youth participation, physical activity across the life span, gender differences, ethnic and economic determinants of lifetime participation, attitudes and perceptions of physical education and physical activity, physical activity preferences, and physical education as an indicator / promoter of lifelong physical activity. This section will be concluded with a summary of the findings from the critical mass.

Youth Participation

Research and general conversation surrounding lifetime involvement in physical activity have examined youth participation as an influential determinant of the continuation of such practices into adulthood. Many studies have indicated involvement at a young age as a positive indicator of continued involvement. For example, research by Yang et al. (2007) supported the ideal that enhancing physical activity in youth plays a significant role in the promotion of health and physical activity within the general population. Further, this particular study concluded that this notion of physical activity during the younger years is the most influential factor for later participation into adulthood (Yang et al., 2007). Another study focused on the tracking of physical activity from childhood to adulthood expressed as a result that physical activity levels in adulthood showed a significant association with childhood participation (Trudeau et al., 2004, p. 1937). However, the study went on to conclude that the correlation was actually quite low. Thus, there is also research that exists that examines that youth physical activity plays little to no role in adulthood participation. As perhaps already inferred by Trudeau and colleagues conclusion on

a low or “weak” correlation, another study concluded that sports participation is not a robust correlate to later adult physical activity behavior (Matton et al., 2006). The results of a study conducted by Engstrom (2008) as well indicated that physical activity participation within a sports club, team or other activities in adolescence (youth) had a no significant association with exercise habits in young to middle adulthood.

Physical Activity Across the Life Span

The majority of the research indicates that age and life stages, along with other life events are influential factors mediating later physical activity participation for the population as a whole. Many studies indicate an age related decline. Research shows that the decline actually begins in adolescence (Butt et al., 2011) and rates steadily decrease into young, middle and older adulthood. According to Larouche and colleagues’ 2012 study (previously mentioned), the percentage of individuals participating in physical activity ≥ 5 hours per week dropped from 70.4% to 17.0% from adolescence to midlife. The sharpest decline occurred when adults enter into the job market (Larouche et al., 2012). Results from another study showed that more specifically and in relation to the female population that being married was a negative factor in predicting later adult physical activity participation (Yang et al., 2007). Further literature suggests a likely and evident fluctuation in physical activity across the lifespan and that many adults tend to drop out and back into physical activity in response to such life events (Ennis, 2010). One final key point suggested throughout the research that is especially influential to this study was concluded within a study tracking physical fitness and activity in females from youth to adulthood. According to researcher Lynn Matton et al. (2006), inactivity is a lifestyle pattern that continues into adulthood and this appears to be particularly the case for females (Yang et al., 2007).

Gender Differences

Most of the literature surrounding determinants and factors related to continued physical activity across the lifespan, reflect differences between males and females. One of the first major differences lies in rate of participation. Research consistently supports that males show higher levels and rates of participation in physical activity than females throughout all age groups (Hawkins et al., 2009; Larouche et al., 2012). According to the results of another study focused more specifically on physical activity rates within the adolescent years, the decline in physical activity was almost two times greater in males than in females (Brodersen et al., 2007). A study by Zimmermann-Sloutskis et al. (2010) found a similar trend in adulthood as well where inactivity which is more of an issue for women than men when age is held constant. Gender differences were also expressed in terms of determinants of continued physical activity. The results from a longitudinal study of attitudes toward physical education and participation in youth sports revealed that participation in organized sport and physical activity in youth was the strongest predictor of physical activity into adulthood in males, while attitude toward physical education was concluded as the strongest predictor amongst females (Kjonnixsen et al., 2009). Further, a similar study conducted on physical activity rates of university students concluded that for males, previous physical education experience had very little impact on current types and levels of physical activity (Kimball et al., 2010). The same study reflected as well that for females, limited learning and discomfort in participation in high school physical education lessons negatively impacted current rates of current participation (Kimball et al., 2010). Finally, a study by Joanne Butt and colleagues yielded some unique and quite influential findings related to gender differences. The results concluded that not only did physical activity decrease in older females but also that enjoyable physical exertion is an attractor more for males than females and

this factor alone is important in mediating inactivity for a target population of women who are prone to inactivity (Butt et al., 2011).

Demographics and Determinants of Lifetime Participation

Additional determinants including race, ethnicity, culture, and socioeconomic background also were commonly referenced themes throughout the literature. More specifically, such factors were generally expressed in relation to their motivating or inhibiting role in physical activity participation. According to a study on the motivators and barriers to engagement in physical activity, African American and Hispanic participants reported race-related barriers to their participation in physical activity (Bragg et al., 2009). An African American (adult) participant in Bragg and colleagues 2009 study even reflected her thoughts stating how one does not typically associate exercise with black people.

It was discussed across several studies as well that African Americans, and Asian Americans especially within the female population participate in higher rates of sedentary activity than their white counterparts (Broderick et al., 2007). Broderick et al. (2007) further concluded that African American females participated and engaged in less physical activity than white females (Broderick et al., 2007). Gender appears to interact with Socioeconomic background which is observed as a determinant of physical activity rates as well. The majority of research reflects that sedentary and less physically active behaviors were more common in lower socioeconomic neighborhoods (Butt et al., 2011). Further, a direct finding from a study on physical activity trends in adolescents found that young females from lower socioeconomic status were less physically active than those of higher status (Broderick et al., 2007). Finally, a conclusion drawn by a study conducted by Lars-Magnus Engstrom (2008) concluded that

individuals from higher social positions (status etc.) were more likely to participate in higher levels of exercise into middle-age and adulthood.

Attitudes and Perceptions of Physical Education and Physical Activity

In addition to experience and cultural factors playing a role in physical activity across the lifetime, more personal determinants such as perception and attitude toward sport and physical education was a commonly addressed theme throughout the majority of the literature. More specifically it was revealed that the skills, perceived level of competence, motivational factors and priorities developed that tie into physical activities can all contribute greatly to future practice (Ennis, 2011; Kimball et al., 2010; Kjonniksen et al., 2009; Makinen et al., 2010; Trudeau & Shephard, 2005). According to research, factors including competency in motor skills, overall perceived competence in participation and, and knowledge development can significantly increase an individual's options to participate in a variety of physical activities and therefore their positively influence their decisions to embrace physical activity across the life span (Ennis, 2011). To add to the ideal of perceived competence or success in PE, some of the research expressed that "high grades" and success in PE is related to adulthood LTPA (life time physical activity) as well (Makinen et al., 2010).

Research highlights the importance of a quality physical education programs in providing positive perceptions and overall experiences in motivating, preparing and instilling physical activity as a priority for students to participate in an active future (Trudeau & Shephard, 2005). As previously discussed related to gender differences as well, research conducted specifically on the influence of attitude toward physical education as an indicator of lifetime participation concluded that especially amongst female students, attitude toward physical education programs was the strongest indicator of future participation and continuation of physical activity

(Kjonniksen et al., 2009). Additional literature suggests that negative experiences or lack of comfort in early physical activity or educational settings can lead to decreased likelihood of continued practice or motivation of physical activities (Kimball et al., 2010).

Physical Activity Preferences

Tangent to the issue of attitudes are preferences. Preference is a key aspect of initial physical activity and education that is a very necessary consideration to be addressed in any physical activity or educational setting (especially at a young age). The results of one study suggest that there is tremendous importance in structuring activities in order to appeal to individual preferences in order to sustain interest and thus deliver a life enhancing program (Butt et al., 2011). Perhaps one of the most significant findings related to attitude and perception as motivational factors was revealed throughout Yang et al research. According to this study, personality and attitudes towards health behaviors (which are found to be relatively stable over the lifespan) are strong and significant determinants of physical activity and therefore in order to effectively increase the level of physical activity across the population as a whole, positive attitudes and experiences in sport and physical activity need to be acquired in the early stages of life (Yang et al., 2007).

A variety of additional research examining the continuation of lifetime physical activity strongly supported the ideal that preference of physical activities (in physical education as well) played a key role in continued participation as well. One of the most largely examined factors associated with this theme was related to a preference of “sport breadth” and the experience of a great variety of physical activities was represented throughout the research as a significant predictor of exercise into adulthood (Engstrom, 2008). Another study examining the influence on physical activity and education at a young age also extended on this point. According to the

Kjonniksen et al., (2009) study, national surveys show that although team and ball games are common to most physical education curriculums, students often become bored due to lack of challenge, variety and overall monotony of such curricular choices. The Kimball et al. (2010) study further concluded via subjective interviews that the common team sport curricula often contributes to female ambiguity toward competition and overall improvement of physical activity. When asked what type of curriculum they (females) would prefer instead, most replied with a yearning for a more diverse range of options in order for them to be able to explore and find what they're good at (Kimball et al., 2010). This study also expressed that females demonstrated more enthusiasm and an overall preference toward more non-traditional activities (Kimball et al., 2010).

Finally, preferences toward activities that promoted “fun and enjoyment” were reported as the most popular selections for physical activity within both adolescents and adults within the Bragg et al. (2009) study on motivation and barriers to extended physical activity. Surprisingly however, the “fun” preference was listed as a key motivator in more adult focus groups than adolescents (Bragg et al., 2009). To supplement this association and preference toward fun and engaging activities, Butt and fellow researchers’ (2011) study also highlighted that “fun of physical exertion” was a one of the more significant motivational factors and preference in male adolescents, while females tended to prefer activities that were focused on enhancing body image.

Physical Education as an Indicator / Promoter of Lifelong Physical Activity

Although the majority of research discusses the role of physical education in relation to a variety of other determinants for continued physical activity, several key points regarding the overall impact of the program were established as well. Several studies including that of Trudeau

et al. (2004) concluded within their study that early required physical education had an overall positive impact on physical activity in adulthood. Furthermore, Makinen and colleagues (2010) study on the influence of adolescent exercise on adult activity levels concluded that high levels of participation in school based physical activities including physical education was positively associated with lifetime physical activity. A longitudinal study on attitudes toward PE of adolescents and adults also concluded that physical education has at least some significance on physical activity levels into adulthood and an influential role in young people's involvement in physical activity (Kjonnixsen et al., 2009).

In general, physical education programs were viewed and expressed throughout the research as a positive indicator of continued physical activity however, there were also several studies that examined the opposite, more negative results. The Kimball et al. (2010) study for example, concluded an overall misalignment between curricular offerings for physical activity in high school physical education programs and current (young adult) activity preferences and modes of exercise. Researchers leading this study recommended physical education programs to provide a more inclusive set of curricular offerings in order to better prepare students for the transition from adolescence into adulthood (and across the lifespan) (Kimball, et al., 2010). Larouche et al. (2012) related to life transitions as well revealed that there were no significant differences between the experimental group (who received 5 hours of physical education per week from grades 1-6) and the control group (40 minutes of weekly PE) by midlife.

Summary

Overall, the findings from the critical mass reveal that there are several additional factors and determinants related to physical education that can play a significant role in the continuation of physical activity from youth to adulthood. First, four out of the thirteen studies examined

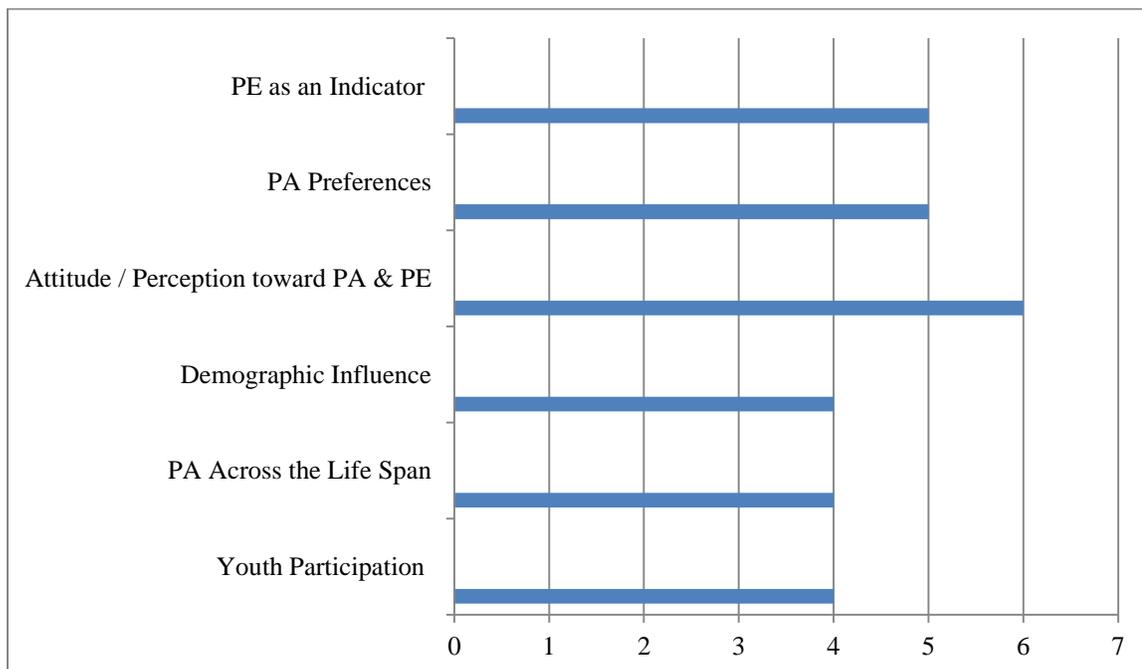
throughout the critical mass were focused on youth participation as a factor in lifetime physical activity participation. Studies revealed mixed results and therefore the unpredictability of participation in physical activity and education in childhood as a positive or influential factor in lifetime participation. In the examination of physical activity patterns across the lifespan, which was a central theme within four out of the thirteen articles included in the critical mass, the studies all supported that physical activity rates decrease across the lifetime especially between adolescence and young adulthood. Gender differences were perhaps one of the most notable themes presented throughout the critical mass of articles (key theme in 7 out of 13 - 54% of the articles). The majority of the research surrounding this factor reflected that although physical activity rates decrease across the lifetime in both genders, females tend to experience the most substantial and significant decrease (Brodersen et al., 2007, Hawkins et al., 2009; Larouche et al., 2012).

CHAPTER 4

DISCUSSION

This final section discusses the findings and specifically those themes derived from the critical mass reflecting the multiple determinants that exist in relation to participation in physical activity across the lifespan. Table 1 illustrates a summary of themes that emerged in the literature that are used to highlight determinants that play into such lifelong involvement. In the upcoming section, a discussion of the themes is discussed, followed by a discussion of the themes believed to be the most influential related to female lifetime physical activity engagement, and finally a section on physical education significant findings is provided related to the critical mass of literature. An additional section including recommendations is provided to help educators

Table 1



Frequency count of major themes presented throughout articles as factors in physical activity participation across the life span and the influence of physical education (N=13).

understand potential influences of curricular offerings and the affective component of the physical education settings to enhance the continuation of physical activity across the lifespan, especially within females.

The themes expressed throughout Table 1 were derived from the critical mass as those most outstanding main ideas and commonly reflected determinants expressed throughout the literature related to physical activity across the life span. In order to display a more easily visible, qualitative reflection of such themes, they were combined into the table above. Very simply, this table reflects the number of articles (out of the 13 total included in the critical mass) that largely focused on each of the established themes. Some of the articles focused on more than one of these themes.

The first theme, “physical education as an indicator,” was derived from the literature based on the fact that many of the articles (5 out of 13) not only examined the impact of youth physical activity on the continuation into adulthood, but the more specific role that physical education can play in such likelihood. Also, as defined by both the title and the overall purpose of this synthesis, the role of physical education in the lifelong promotion (“indication”) of physical activity was meant to be a central focus. Thus, encouraging all the more the extraction and incorporation of this theme into the overall explanation and discussion. Evidence of this notion was supported frequently throughout the literature and perhaps most clearly through Makinen and colleagues (2010) study which directly concluded that: “high participation in school physical activities...including PE, was associated with adulthood LTPA (lifetime physical activity)” (p. 2). Overall, the results from the Makinen et al. study and several others support that physical education is a significant determinant and therefore a key area to enhance, improve and increase its influence.

Next, the “physical activity preference” theme was extracted from the critical mass as a result of the literature’s consistent reference toward the ideal that type and modality of physical activity are significant indicators of motivation for lifelong participation. Researchers such as Butt et al., and Kimball et al., reflected several examples of different preferences across gender and age. One specific example expressed throughout the Kimball et al. (2010) study stated that “females...had more emotional attachment to non-traditional activities” and preferred a “more diverse range of things to do” (p. 260). Such information therefore can yield extremely helpful information toward curriculum choices in the physical education setting in an effort to appeal to a larger range of students and increase chances of continued physical activity.

Additionally, specific research related to levels of physical activity across the stages of the lifespan and the age related decline were quite popularly and consistently presented throughout the literature as determinants (within themselves) as to an individual’s likelihood to engage. Thus, the theme “physical activity across the lifespan” was developed. Such a trend was especially exposed throughout the Larouche et al. (2012) study on the “...waning of physical activity...” across the lifespan (p. 516). As if the title doesn’t express it all, the results of the study indicated a “progressive...decline of physical activity involvement [across the major life stages from childhood to adulthood]” (Larouche et al., 2012, p.516). Clearly, this theme is extremely evident and important in the overall understanding of how PE can help to promote activities to avoid the decline especially as it was reflected to begin in adolescents (while PE can still make a difference).

Youth participation in physical activity (outside of the physical education setting) was also a commonly discussed theme and significant determinant presented throughout the literature and therefore selected as a key point to be emphasized. It was common for this particular theme

to even stand out within the title or purpose of the literature examined, thus indicating the common belief and key interest in researchers to understand this determinant in relation to lifelong practice. For example, data presented throughout research by Engstrom, Trudeau et al., and Yang et al., especially centralized and expressed their findings associated with this theme. First, the Yang et al. (2007) study, concluded that “enhancing youth physical activity plays an important role in the promotion of physical activity and health in the general population” (p. 130). Further, Engstrom concluded that “...sport habitus...” those practices and participation experiences in sport and physical activity established in youth, “...had a significant association with later exercise habits” (Engstrom, 2008). However, studies such as Trudeau et al., indicated a “significant but weak association” between adult and youth physical activity. Clearly, although there was a bit of inconsistency presented within the results related to this particular theme, the mixed results could indicate that participation outside of physical education during youth is not enough in ensuring continued involvement.

Perhaps a less expected, yet clearly significant theme that stood out amongst the literature was “demographic influence” on physical activity. In addition to gender difference as a significant determinant toward physical activity, the majority of the articles further specified difference in race and socio-economic background as influential in the establishment and continuation of physical activity habits across the lifespan as well. Several of the studies examined especially that of Broderson et al. (2007), focused specifically on such differences concluding that: “Ethnic and SES differences are observed in physical activity and sedentary behavior in...youth that anticipate adult variations” (p.140). The same study also went on to further state that identifying and “reversing [negative] patterns requires earlier intervention” (Broderson et al., 2007, p.140). The additional factors displayed by this theme is important and

very relevant to the providing of a quality program therefore must be considered in the establishment of a life-long enhancing physical education program.

Finally, the most significant theme derived from the literature was related to “attitude and perception toward physical activity and physical education.” This theme was a tremendously significant factor as the majority of studies reflected the extensive influence such a determinant can play both within individual stages of life as well as in the long run or “grand scheme.” For example, research conducted by Kjonniksen et al. (2009) as well as a multitude of additional studies, concluded strongly on the significant importance of attitude and perception especially within females; this particular study stating that: “attitude to PE [and physical activity] was the strongest predictor [of involvement into adulthood] in females” (p. 39). Overall, it is on this particular theme that the majority of the following discussion will be based as the information related to this theme will be utilized to develop a life-long physical activity ensuring curriculum based on enhancing female participation specifically focused on the affective domain.

Recommendations and Curricular Development

There is a compelling amount of research that supports the notion that a gender gap exists as there is a clear, significant, drop off in physical activity after adolescence (the end of the high school years) especially within the female population. Thus, it appears that for the most part, current programs have traditionally been unsuccessful in fulfilling one of physical education's ultimate goals – lifetime physical activity. According to the synthesis of the critical mass of articles, attitude and perception of physical activity appears to stand out the most in relation to motivation or habitus for continued involvement in physical activity especially in females. Experts such as Ennis (2010), recommends that programs strive to “increase students’ ...perceived competence, and enjoyment in physical education” in order to lead them most

successfully toward lifetime physical activity choices after the influence of physical education is complete. This makes sense based on the studies by Ennis, 2011, Kimball et al., 2010, Kjonniksen et al., 2009, Makinen et al., 2010, and Trudeau and Shephard, 2005 who support this contention. Therefore, a program more centralized on the affective domain and especially female attitude development regarding physical activity type and level of involvement could be just the key toward filling the gap. Thus, the following list of recommendations along with the “Yearly Student Influenced Curricular Plan of Action,” should be strongly considered in order to increase the likelihood of continued influence of physical education across the lifespan.

- 1.) Programs should increase focus on achievement in the “affective domain” (50% or greater).
- 2.) Programs should provide students with a student-selected, choice curriculum based on more non-traditional activities (see Appendix A for sample).
- 3.) Programs should ensure that each activity has a focus that female students especially find meaningful and enjoyable and can access outside of the classroom, individually, and at least potentially across the lifespan.
- 4.) Programs should ensure a safe and success oriented environment sensitive to females and accepting of a variety of attitudes, perceptions and backgrounds.
- 5.) Programs should provide a genuine reflection process at the end of each class session or unit to assess whether or not student attitudes and perception toward course activities are remaining positive and influential.

Along with this concise list of recommendations, there is still a need for a supplemental model or clear direction for the implementation process to take place. Thus, Figure 1 illustrates a very basic outline for a “Yearly Student Influenced Curricular Plan of Action” in which teachers

and students alike can strive to follow and maintain the process of moving toward a more affectively based, student centered physical education curriculum. The central basis of the plan is to begin each year with a pre-assessment to better gauge and understand each individual student's preferences for physical activity and physical education. Such preferences can include anything from type or modality of physical activity to class setting and learning environment. The idea is that from the preferences expressed by the students, teachers can better adapt and establish the most motivating and appealing curriculum possible to fit each student and

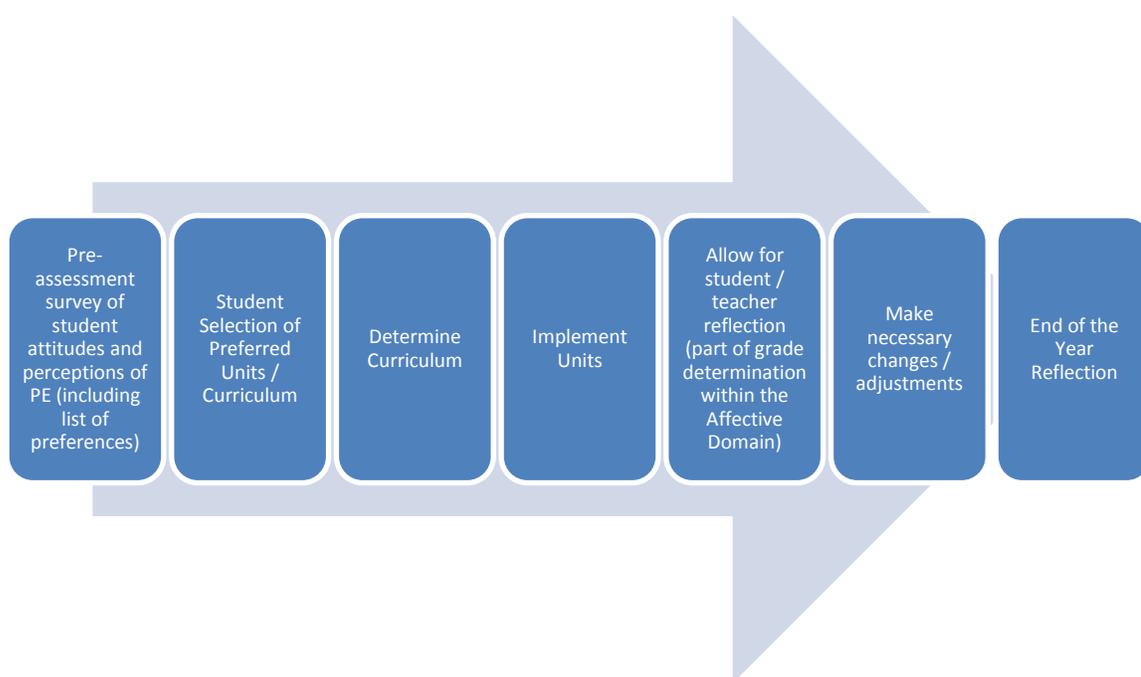


Figure 1. Model for a Yearly Student Influenced Curricular Plan of Action

ultimately increase and establish positive attitudes and perceptions toward physical education and physical activity as a whole. The final stages of the model allow for consistent teacher and student reflection in order to re-adjust programs where necessary in order to ensure the maintenance of such positive perceptions both throughout the school year and ultimately across the lifespan.

Overall, a curriculum based fully on student chosen and preferred activities as well as a consistent reflection process will hopefully establish a positive link between student preference as well as program goals. Allowing students to have some ownership over their learning (especially at the secondary school level) will perhaps increase their likelihood of establishing an overall positive attitude and perception toward their participation both in the physical education setting and across the lifespan. This plan, coupled with an increased emphasis on the affective domain (rather than those programs significantly based on psychomotor and skill performance) as well as the above mentioned list of recommendations will provide a nurturing, positive learning environment for all students, especially females, to gain competency in a variety of lifetime activities that they can learn to enjoy at this young age as well as develop the motivation to continue into adulthood.

Resources and Supports for Implementation

The implementation of a plan such as the “Yearly Student Influenced Curriculum” discussed above would certainly take some significant change in the majority of existing programs however the results could very well be quite worth it. First, prior training for teachers is needed and this can take place during pre-service preparation or later as an in-service model facilitated by district athletic directors or physical education coordinators. Thus, all teachers within the program will need to have a thorough background, understanding and commitment to what it means to teach to a more affectively based curriculum as well as the recommendations and model (such as the one presented in Figure 1) present.

As student choice or preference is to be considered within the curricular development, programs will have various logistical issues such as how to best accommodate for the incorporation of various physical activity choices as well as class settings. For example, there

may be students who prefer to learn within a same-sex setting rather than the traditional co-educational setting while also largely preferring non-traditional activities over team sports. On the other hand, there may be many students who prefer a co-educational setting and prefer team sports. From the information collected from the initial assessment of student preferences (much like that outlined in the first phase of the Figure 1 model), programs can then establish a set of a few, manageable yet accommodating curriculum plans and place students into those that best suit individual preferences. Finally, an important point that requires emphasis is that teachers, students and other program personnel need to reflect continuously in order to ensure the maintenance of the success of this type of model. Action research principles as well as continuous data collection are required to ensure that changes in curricular emphasis result in changes in learner activity levels. Overall, the process requires drastic change in both philosophy as well as program administration. The notion of incorporating learner preference with appropriate teacher interactions has the potential to shape attitudes and perceptions of female students to ensure a positive impact with a lasting effect resulting in lifetime physical activity.

Future Research

Clearly, evidence exists in the examined studies highlighting a complex relationship between a variety of factors and determinants which impact lifetime involvement in physical activity. Additional research findings suggest differences between males and females with continued support that males are in fact more active than their female counterparts. In order to promote the most influential program possible for students of both genders, especially as current standards largely mandate co-educational settings, further research needs to be done on how to best accommodate for the attitudes, perceptions and overall preferences of each.

An important point is that throughout the research there really were no studies which examined physical education programming and the potential influence on later physical activity in adult females. In general, the inferences that could be found on physical activity as an outcome from good physical education programming is missing in the longitudinal research in both the health related and educational literature. Therefore, it is vital to examine results that follow up and utilize longitudinal studies on women and their attitudes, perceptions and preferences toward physical education which in turn may help educators understand the long term impact of programming. The above established “Yearly Student Influenced Curriculum” model for example could even be implemented and female participants specifically surveyed or interviewed several years down the road to have a clear measure of the effectiveness of such a model in the continuation of physical activity into adulthood. At that point, if research over the long term indicates a positive impact and overall success, such a model can become evidence based practice. On the other hand, if necessary, adjustments, different accommodations or even a new start or direction for curricular development can be made. Perhaps this is where programs have been going wrong all these years. They have continued to simply pass along their students after commencement with no understanding or consideration of the future outcome or influence of their efforts and the therefore the impact of physical education continues on a downward spiral. Overall, continued research and analysis of the effectiveness of curricular models over time such as that process presented above, is critical in the promotion of lifetime physical activity in females.

Conclusion

The focus of this paper was to examine the continuation of health enhancing physical activity levels in females from youth to adulthood and across the lifespan, specifically; to

determine the influence and role of physical education as a determinant of such lifelong participation in physical activity. Although an analysis of the literature reflected some differing results of the extent of the influence of physical education programs on lifetime physical activity, those specifically related to female involvement consistently noted the program as an influential factor (whether positive or negative). Amongst the themes selected from the literature, attitude and perception toward physical education and physical activity stood out as the most significant. Research shows that attitude toward physical education was amongst the strongest predictors of continued involvement into adulthood amongst females. Thus, a more affectively based curriculum based on student centered selection of lifetime, non-traditional activities and consistent reflection of attitudes and perceptions of each unit is recommended for physical education programs to deliver the most influential and lasting education possible for females. Clearly, although there are a variety of determining factors influencing physical activity across the lifespan, physical education is one of the few that can be manipulated and capitalized on as a critical setting for females to develop the attitude, perceptions and experiences necessary to carry out a lifetime of physical activity.

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Appendix A

SAMPLE NON-TRADITIONAL ACTIVITY / STUDENT SELECTED CURRICULUM,
WITH EMPHASIS ON THE AFFECTIVE DOMAIN

SEASON / QUARTER	SPORT/UNIT
<p><i>Fall</i> (1st into 2nd quarter)</p>	<p>Introduction to Lifetime PA / Student Selection of Units</p>
	<p><i>**STUDENT / TEACHER REFLECTION AND ADJUSTMENTS**</i></p>
	<p>“What’s so Great about the Gym” Unit</p>
	<p><i>**STUDENT / TEACHER REFLECTION AND ADJUSTMENTS**</i></p>
	<p>Outdoor Lifetime Sports (Kyacking, Biking etc.)</p>
<p><i>Winter</i> (2nd into 3rd quarter)</p>	<p>What to do with the “winter blues” Unit (X-C skiing, snowshoeing etc.)</p>
	<p><i>**STUDENT / TEACHER REFLECTION AND ADJUSTMENTS**</i></p>
	<p>Yoga / Pilates</p>
	<p><i>**STUDENT / TEACHER REFLECTION AND ADJUSTMENTS**</i></p>
	<p>Dance</p>
<p><i>Spring</i> (3rd into 4th quarter)</p>	<p>“Who has time for that?” – Introduction to quick and easy workouts fitness unit</p>
	<p><i>**STUDENT / TEACHER REFLECTION AND ADJUSTMENTS**</i></p>
	<p>Personal Fitness Goals Unit</p>
	<p><i>**STUDENT / TEACHER REFLECTION AND ADJUSTMENTS**</i></p>
	<p>Summer time favorites / End of the Year Reflection and Evaluation</p>
<p><i>**STUDENT / TEACHER REFLECTION AND ADJUSTMENTS**</i></p>	

APPENDIX B

Physical Education as a Determinant of Lifelong Physical Activity in Females

Source: Larouche, R., Laurencelle, L., Shepard, R.J., Trudeau, F. (2012). Life transitions in the waning of physical activity from childhood to adult life in the Trois-Rivières study. *Journal of Physical Activity and Health*, 9 (4), 516-524. Retrieved from <http://ezproxy2.drake.brockport.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=mnh&AN=22592870&site=ehost-live>

Study	Problem Statement	Subjects	Instruments	Procedures	Findings
(Larouche et al, 2012)	The purpose of this study was to examine the impact of physical activity across four main transition periods throughout the lifetime (puberty / secondary school, beginning of post-secondary education, entry into the job market and parenthood) as well as to assess whether or not “enhanced PE” in the primary school years could lead to longer-term adherence to lifetime physical activity.	The study involved 86 total participants (44 females and 42 males) in their mid-forties who were recruited from both the control and experimental groups of the first follow up study to the “Trois-Rivires” study.	<p>All interviews were recorded and later transcribed.</p> <p>All qualitative data were entered into a Micosoft Excel worksheet.</p> <p>Quantitative data was entered into SPSS 12.0 and analyzed.</p>	<p>A series of semi-structured individual interviews were conducted in which interviewers met with each participant in person.</p> <p>Participants were asked to describe their weekly physical activity (frequency and duration) that they practiced after each transitional period.</p> <p>Prior to the interviews, participants were informed of the definition and activities that physical activity includes.</p> <p>Questions were for the most part, open-ended.</p>	<p>There is a “sharp decline” in physical activity across the four major life stages.</p> <p>Women reported more barriers to physical activity than men across each of the stages.</p> <p>The largest drop (75%) in physical activity level occurred between secondary school and parenthood.</p> <p>The life-stage in which the most significant decline existed was the transition to the job market.</p> <p>Results from the experimental group showed that established exercise habits in early life/child hood do not necessarily ensure high levels of PA into adulthood.</p>

Notes (Connection to PE): PE programs offered at the early years may not have as great of a “lifelong effect” as hoped. Therefore there may be a need for greater measures at each of the “transitional stages.” Also, perhaps programs are not as effective as hoped therefore, change in programs may be necessary.

Source: Hawkins, M., Storti, K., Richardson, C., King, W., Strath, S., Holleman, R., & Kriska, A. (2009).

Objectively measured **physical activity** of USA adults by sex, age, and racial/ethnic groups: a cross-sectional study. *The International Journal Of Behavioral Nutrition And Physical Activity*, 6, 1-7.

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Study	Problem Statement	Subjects	Instruments	Procedures	Findings
(Hawkins et al, 2009)	The purpose of this study was to provide an objective examination to determine physical activity levels (by sex, age and ethnic / racial group) amongst a national sample of American Adults	The subjects involved in this study included 2,688 adults (from varying sex, age and racial/ethnic groups) with valid "accelerometer" data.	The majority of the data for this study were taken from the 2003-2004 NHANES study on a sample of the U.S population. Rate / amount of Physical Activity was measured with the "Actigraph AM-7164 accelerometer" after 7 days following an examination.	First, data was taken from the 2003-2004 NHANES study in which PA was measured with the "Actigraph AM-7164 accelerometer" after 7 days following an examination. A sample group was selected from the data who had valid accelerometer data. Mean daily total PA counts (as well as minutes in light, moderate-vigorous intensity) were presented by sex across age and racial/ethnic groups. Rates were compared to examine in sex and racial / ethnic groups while adjusting for age.	Physical Activity decreases with age for both men and women across all groups. Men are more active than women (with the exception of the Hispanic women). Hispanic men are more active than their white and black "counterparts."

Notes (Connection to PE): Understanding culture, ethnicity and race and adapting programs to best appeal to each can make a difference in continued involvement.

Source: Matton, L., Thomis, M., Wundaele, K., Duvigneaud, G., Claessens, A., Vanreusel, B., Philippaerts, R., & Lafevre, J. (2006). Tracking of physical fitness and physical activity from youth to adulthood in females. *Official Journal of the American College of Sports Medicine*, 38 (6), 114-1120. Retrieved from http://www.researchgate.net/publication/7007260_Tracking_of_physical_fitness_and_physical_activity_from_youth_to_adulthood_in_females/file/32bfe51011ad484b23.pdf

Study	Problem Statement	Subjects	Instruments	Procedures	Findings
(Matton et al, 2006)	The purpose of this study was to examine the stability of physical fitness and physical activity levels from adolescence to middle age adulthood in females.	Participants in this study included 138 females who were part of the Leuven Longitudinal study on Lifestyle, Fitness and Health. The same participants were seen and their statistics recorded at the average age of 16 and then again at the age of 40.	In order to account for the abnormal distribution of variables between the initial and follow up studies, the “nonparametric Wilcoxon rank-sum test” was utilized. Physical measurements of participants dimensions were measured by a “Holtian stadiometer electronic scale, and Harpenden caliper. Physical activity was measured via sports participation and data were collected by a standardized questionnaire and later a computerized questionnaire. All statistical analyses were analyzed via the SAS 9.1 package.	Data for the 138 females were collected both at the average age of 16 and then 40 years of age. Across both the initial and follow up data collection several body dimension measurements and fitness tests were taken. Data for physical activity were recorded via sports participation inventory. Correlations were calculated between adolescent and adulthood – percentages of subjects who maintained and or changed in fitness or activity level were analyzed. Odds ratios were calculated for less activity and overweight in adulthood in relation to activity and weight during adolescence.	The majority of physical fitness scores remained stable from adolescence to adulthood (higher levels of stability than physical activity) Sports participation (the measurement for Physical Activity level) was not stable. 63.6% remained within their categorized weight ranges, 54% remained in their activity level group. The odds of being overweight in adulthood was 9.53 times higher in overweight as compared to normal weight adolescent girls (weight status in adolescence was similar and generally indicative of adult weight status. Activity patterns of less activity rather than activity tended to continue from adolescence to adulthood.

Notes (Connection to PE): Low physical activity in youth yields low physical activity in adulthood. PE has direct responsibility to promote physical activity in youth.

Source: Trudeau, F., Laurencelle, L., and Shephard, R. (2004). Tracking of physical activity from childhood to adulthood. *Official Journal of the American College of Sports Medicine*, 36 (11), 1937-1943. Retrieved from http://www.setantacollege.com/wp-content/uploads/Journal_db/Tracking%20of%20Physical%20Activity%20from%20Childhood.pdf

Study	Problem Statement	Subjects	Instruments	Procedures	Findings
(Trudeau et al, 2004)	The two main purposes of this study were to examine the relationship of physical activity in childhood compared to adulthood as well as the influence of an enhanced physical education program and parental physical activity on long-term levels and participation in physical activity.	The participants involved in this study were selected from a subgroup of the Trois-Rivieres study. A group of 87 women and 79 men. Participants were split into the either the experimental group (57 females, 51 males) who's primary school experiences involved 5 hours per week of PE taught by a specialist, and control group (30 females, 28 males) a typical program taught by non-specialists, and only for one 40 minute session per week.	The tool utilized in the initial collection of data included twice weekly completed diary sheets (later coded for time, intensity and duration) by lab staff. A questionnaire was utilized for data collection during adulthood measurement. Statistical analyses were analyzed via the 6.06 SAS software program.	Data on Physical Activity levels of a sample group of 166 participants selected from the Trois-Rivieres study (when they were 10-12 years old) were compared to the data collected on the same subjects at the age of 35 years. Weekly duration of total, intense, light, organized physical activity and sedentary behaviors were correlated with responses to an assessment questionnaire of total weekly physical activity as a result.	Levels of adulthood physical activity showed a significant yet weak correlation to childhood physical activity. In female participants, a higher physical activity frequency as an adult showed significant association with the enhanced physical education program No association between physical activity patterns between children and parents. Overall, results showed a positive impact of required physical education early in life in relation to levels of physical activity in adulthood.

Notes (Connection to PE): Significance of an early, required and overall, influential program.

Source: Kimball, J., Jenkins, J., & Wallhead, T. (2009). Influence of high school physical education on university students' physical activity. *European Physical Education Review*, 15 (2), 249-268. Retrieved from <http://ezproxy2.drake.brockport.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=s3h&AN=51363769&site=ehost-live>

Study	Problem Statement	Subjects	Instruments	Procedures	Findings
(Kimball, Jenkins & Wallhead, 2009)	The purpose of this study was to examine the influence of high school physical education programs on college students' physical activity levels using the "Lifelong Physical Activity Framework."	The subjects involved in this study included 365 college students (147 males and 218 females with a mean age of 20.2) who were enrolled in a physical activity course.	The data collection tools for this study included a questionnaire and interviews with the focus group. This mixed method strategy was meant to strengthen data and increase depth of analysis. In addition, the 7D-PAR (Stanford 7 Day physical activity recall) was used to measure current levels of PA. The "qualitative deductive theme approach" was used to analyze responses from the questionnaires.	First, data were collected from the sample groups via questionnaire (pertaining to current levels of PA and perceptions of Physical Education) and interviews (gender segregated, 3-6 per group). Next, each research question was carefully broken down and analyzed. All interviews were transcribed and data were sorted and later broken down into specific, common themes.	There is a "misalignment" between current trends and modalities in PA and curricular choices in high school physical education. For female students, lack of learning and an uncomfortable learning environment were negative predictors of PA into their current lives. For male students, participation in high school physical education had very little effect on current levels of PA. It is obvious that physical educators need to provide more engaging, inclusive curricular offerings to better prepare students and ensure / encourage PA for the change to adulthood.

Notes (Connection to PE): There is an obvious misalignment between current curricular offerings and activities that individuals participate into adulthood. Physical Educators need to work on aligning these two stages as well as ensuring an inclusive, comfortable and safe environment for students.