1 **Title: University Students' Attitudes Toward Physical Education**

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Abstract

While there have been many studies into students' attitudes toward Physical Education at the school level, far fewer studies have been conducted at the university level, especially in China. This study explored 949 students' attitudes toward their university Physical Education experiences in four Chinese universities. An inter-correlated model of students' attitudes toward Physical Education comprised of five dimensions, namely Physical Fitness, Self-Actualization and Social Development, Physical Education Curriculum, Physical Education Teachers, and Physical Education Teaching, was conceptually and empirically developed and tested using exploratory and confirmatory factor analysis. The overall findings suggested that the students had moderately positive attitudes toward Physical Education. More specifically, the findings indicated that students' attitudes had a significantly positive moderate association with their current participation, a small association with their intended lifelong participation in physical activity outside school, and a significantly positive moderate association with their Physical Education academic achievement. Implications for Physical Education teacher training and curriculum modifications are discussed.

Keywords: Chinese education, exploratory factor analysis, confirmatory factor analysis, participation in physical activity

University Students' Attitudes Toward Physical Education

Research studies have shown that Chinese youths are experiencing a sedentary lifestyle with less participation in, and a general reduction of, physical activity outside the Physical Education curriculum (Zhang, Middlestadt, & Ji, 2007). A survey of 50 universities in China showed that many university students seldom participated in physical activity outside the curriculum and the situation for university females was worse (Chen, 2010). This decrease in youth participation in physical activity emphasizes the need to identify factors that may have the potential to increase students' level of participation in physical activity (Motl et al., 2001). Several studies suggest that there may be a relationship between Physical Education at school and participation in physical activity outside the curriculum (Kjønniksen, Fjørtoft, & Wold, 2009; McKenzie, 2003; Trudeau & Shephard, 2005). As Silverman and Subramaniam (1999) have pointed out: "the increase in student attitude research related to Physical Education may be attributed, in part, to the influence attitude may have on future participation in physical activities among youth" (p. 99). McKenzie (2003) emphasized the role of Physical Education: "by engaging students in enjoyable physical activity and teaching them the skills related to developing and maintaining appropriate physical activity, Physical Education could help future generations of adults avoid becoming so sedentary" (p. 207).

Fairclough and Stratton (2005), working with high school students in Portugal, have argued that Physical Education classes may offer a logical and plausible context for regular participation in physical activity noting that programs are mandatory in many countries and therefore reach virtually all students. For many students in the United States, Physical Education classes may be the only place where they engage in physical activities, learn basic motor skills, and prepare themselves for a lifetime of physical activity during the elementary school years (Graber, Woods, & Castellli, 2007). In England, research suggests that Physical Education classes could play a pivotal role in efforts to encourage all students to increase their levels of participation in physical activity at the middle school level (Hilland, Don Vinson, & Fairclough, 2009). In the United States, it has been argued that an investigation of students' attitudes toward Physical Education will provide a holistic understanding of student Physical Education achievement at the elementary school level (Graham, Holt-Hale, & Parker, 2007), inform curriculum changes (Silverman & Subramaniam, 1999; Zeng, Hipscher, & Leung, 2011) and inform pedagogical modifications

at the high school level (Rikard & Banville, 2006).

Consequently, it might be useful to explore Chinese university students' attitudes toward Physical Education in order to address the issue of sedentary lifestyle and the declining participation in physical activity among Chinese youths generally. Students' voices can reflect their experiences and provide invaluable information toward understanding their Physical Education experiences (Cothran, Kulinna, & Garrahy, 2003; Ravizza & Stratton, 2007). However, much of the significant research into students' attitudes toward Physical Education has been in Western countries and has focused on the K-12 level. There is limited empirical evidence on university students' attitudes toward Physical Education, especially in China. Students' attitudes toward Physical Education depends on factors such as the context, the structure of Physical Education, and the Physical Education curricula, which can vary across countries (Guan, McBride, & Xiang, 2005). In addition, although Physical Education is recognized as important for leading to an active lifestyle for students and to their learning gains, Physical Education is inhibited by low status, relatively little time allocated to it in the university curriculum, and poor quality programs in universities in China (Wang, Wang, & Liu, 2008).

The purpose of this study is to explore university students' attitudes toward Physical Education in universities in China, including the relationship between those attitudes and the frequency and duration of students' current participation, their intended lifelong participation in physical activity, and their Physical Education academic achievement. It is expected that this study will contribute to efforts to develop active lifestyles in Chinese youth and will inform future Physical Education teaching and curriculum interventions at the university level in China. Additionally, it will contribute to global research in the filed by informing interested Western researchers about Chinese Physical Education and its contrast with Physical Education in Western universities.

Students' Attitudes toward Physical Education

To better inform intervention efforts in engaging student participation in physical activity, many research studies have already investigated students' attitudes toward Physical Education. In this section, we first present a review of some general studies related to Physical Education at different educational levels. Secondly, from the general literature, five principal categories have been synthesized, namely, attitudes

toward Physical Education Curriculum, Physical Education Teachers, Physical Education Teaching, Physical Education Benefits and Students' Self-perceptions of Their Physical Education Ability. Literature specific to those domains is presented. Thirdly, studies of relations between student characteristics and their attitudes toward Physical Education are discussed. These studies have provided a conceptual framework. The five categories provided guidance in designing the research instrument, data analysis procedures, and they have informed our discussions. Likewise, accounts in the literature of how student characteristics influence their attitudes have enriched our own data analysis and our discussions.

General Studies of students' attitudes toward Physical Education

K-12 school students' attitudes toward Physical Education. Research in a number of countries, focusing on the K-16 level, has identified various categories or dimensions of students' attitudes toward Physical Education. Studying 3,344 students aged 11-18 years at the middle and high school levels in England, Van Wersch, Trew and Turner (1992) identified five categories of educational importance in relation to student interest: Physical Education connotation, Physical Education status, Physical Education teachers, Physical Education curriculum, and adolescent disturbances in relation to Physical Education classes. The status of Physical Education as a school subject was found to be the most important variable for student interest in Physical Education. The contribution of the Physical Education teacher to students' level of interest was the least important of the factors examined. AL-Liheibi (2008) examined 230 middle school students and 250 high school students in Saudi Arabia and found that students' attitudes toward Physical Education were related to personal satisfaction about health benefits, Physical Education teachers, Physical Education curriculum, and the availability of facilities and equipment.

Other studies have focused on high schools. In Canada, Luke and Sinclair (1991) examined determinants of 488 high school students' attitudes toward Physical Education based on their school Physical Education experiences from kindergarten through Grade 10. Results identified five main attitude dimensions: Curriculum content, teacher behavior, class atmosphere, students' self-perception of their Physical Education ability, and facilities. Curriculum content was the most influential factor in the development of positive and negative attitudes toward Physical Education. In the United States, Rikard and Banville (2006) investigated 515 high school students' attitudes toward Physical Education and identified

three categories: curriculum choices made by teachers, instructional strategies used in classes, and the influence of Physical Education on participation outside school. Students' attitudes were accepting or tolerant of participation in fitness activities due to known health benefits.

University students' attitudes toward Physical Education. Comparatively, few studies have investigated university students' attitudes toward Physical Education. Recently, Omar-Fauzee et al. (2009) investigated 113 university students' attitudes toward their Physical Education classes during their high school days in Malaysia through three categories: general knowledge, Physical Education, and the scientific basis of physical activity. General knowledge refers to students' feelings or attitude toward physical activity. Physical Education is about how an individual perceives the way Physical Education is taught in the curriculum. The scientific basis refers to how an individual values the scientific benefits of exercise. Each category contained questions which served to evaluate the students' attitudes toward physical activity. The results showed that these students exhibited positive attitudes for all three categories, but male students' rankings were significantly higher than female students' in terms of general knowledge and the scientific basis of physical activity. Adams, Higgins, Adams, and Graves (2004) investigated university students' attitudes toward physical fitness, health-related fitness knowledge and current exercise habits following completion of a required conceptually-based health-related fitness course in the United States. Results indicated that students' attitudes toward physical fitness had a significant influence on their perceived level of knowledge regarding health and their perceptions of the value of the health-related fitness course. Figley (1985) investigated the K-12 experiences of 100 United States university students, enrolled to become as either elementary school teachers or special education teachers. Five broad categories of these students' attitudes toward Physical Education were identified: teacher, curriculum, atmosphere of the classroom, peer behavior, and perceptions of self. The results found that curriculum content and teacher behavior most strongly influenced their attitudes toward Physical Education.

There are two classic studies on university students' attitudes toward physical activity or physical education. Broer, Fox, and Way (1955) examined 1,149 freshman female students' attitudes toward physical activity at the University of Washington. Results showed very favorable attitudes from these students. The students in swimming and tennis seemed to have more favorable attitudes and those in

archery had less favorable attitudes. These students also reported that Physical Education activity classes contributed to their social development, mental and physical health. Brumbach and Cross (1965) measured all male students' attitudes toward Physical Education at the University of Oregon. Similar to the attitudes of female university students at the University of Washington in the aforementioned study (Broer, Fox, Way, 1955), these male students reported favorable attitudes toward Physical Education. More specifically, the more years of Physical Education a student had in high school, the better his attitude was likely to be.

Five Principal Categories of Student Attitudes toward Physical Education

From the general attitude literature, five principal categories have been derived to analyze students' attitudes toward Physical Education in this study, namely Physical Education Curriculum, Physical Education Teachers, Physical Education Teaching, Physical Education Benefits, and Students' Self-Perception of their Physical Education Ability. The literature relating to each of these five domains is presented.

Physical Education curriculum. In the United States, curriculum is reported to be a strong factor influencing students' attitudes toward Physical Education in terms of its status, content, and aims at the high (Rikard & Banville, 2006) and middle school levels (Subramaniam & Silverman, 2000). According to Ballin and Johnson (1994), Physical Education is a popular subject at the K-12 level in the United States since it offers students different experiences from those provided in academic disciplines. Physical Education classes may be held at an outside classroom. At the high school level in Turkey, researchers found physical experience and mastering of physical skills can contribute to the young person's sense of achievement. Students' desire to enjoy some time without the pressure of academic success contributes to their positive attitudes toward Physical Education (Koca, Asci, & Demirhan, 2005). It has also been found that the marginal status of Physical Education in school curricula has had a negative impact on students' attitudes (Subramaniam & Silverman, 2007; Tannehill, Romar, O'Sullivan, England, & Rosenberg, 1994).

Curriculum content is an influential factor in the development of positive and negative attitudes toward Physical Education at the K-12 level (Luke & Cope, 1994; Ryan, Fleming, & Maina, 2003). Studies have shown that similarities in curriculum content at different grades affected students' attitudes at the high school level in the United States (Tannehill et al., 1994). Carlson (1995) indicated that students would lose

interest in participation if the curriculum content lacked challenges. How to organize the curriculum content in Physical Education classes is also a concern. Siedentop (2004) argued that a multi-activity curriculum with a series of short-term units covering a wide variety of activities would be a major positive influence on students' attitudes toward participating in Physical Education. Tannehill and Zakrajsek (1993), studying high school students in the United States, proposed that a Physical Education curriculum should be designed to give youth of both sexes more opportunities to become successful in motor activities in Physical Education classes and that activity and content selection should interest the students. Working with high school students in Austria, the Czech Republic, England, and the United States, Stelzer, Ernest, Fenster, and Langford (2004) suggested that the central mission of the curriculum should be to focus on meeting the needs of youth in their pursuit of lifelong participation in physical activity and healthy lifestyles.

Physical Education teachers. Research suggests that Physical Education teachers have a deep impact upon their students' attitudes toward Physical Education. In the United States, Ryan et al. (2003) found that 13% of middle school students reported that they disliked Physical Education classes because they disliked their Physical Education teachers. At the high school level in Canada, Luke and Sinclair (1991) found that teacher characteristics, such as being stern or strict, negatively affected student perceptions of their teacher and consequently their passion for Physical Education. Rice (1988) reported that 73% of student participants at the high school level in the United States considered that their Physical Education teachers were good role models, and friendliness was the factor that students appreciated most about their Physical Education teachers. Teacher subject knowledge and good skill levels also affect students' attitudes at the high school level in the United States (Rikard & Banville, 2006). Similarly, at the middle and high school levels in Turkey, highly skilled and devoted Physical Education teachers have the potential to encourage students to participate in Physical Education classes (Arar & Rigbi, 2009). University students in the United States responded positively to teachers who delegated responsibility and who exhibited sensitivity toward students (Figley, 1985).

Physical Education teaching. Teaching has been shown to influence students' attitudes substantially. Students' enjoyment of and attitudes to Physical Education classes would increase if they were provided

with a comfortable and confident learning environment (Ravizza & Stratton, 2007; Subramaniam & Silverman, 2007). If Physical Education teachers are able to provide appropriate programs, offer students choices of activities, and in general, satisfy student needs, students hold more positive interest in and attitudes toward Physical Education (National Association of Sports and Physical Education, 2006; Wang, Liu, Sun, Lim, & Nikos, 2010). Students also appreciate appropriate teacher feedback (Duffy, Warren, & Walsh, 2001) and being encouraged to take ownership of their learning (Subramaniama & Silverman, 2007). Portman (2003), working at the high school level in the United States, found that grouping students encouraged them to contribute to the team effort, improved their participation in Physical Education classes and provided them with enough time on task to practice skills and improve their confidence to participate.

Physical Education benefits. The benefits of physical fitness, self-actualization, and social development are considered to influence students' attitudes toward Physical Education. Students' motor skill levels, skill proficiency and physical fitness clearly affect students' participation in physical activity and their attitudes toward Physical Education. For example, students who are highly skilled reported positive experiences and attitudes toward Physical Education (Silverman & Subramaniam, 1999) and successful participation in Physical Education programs (Portman, 2003). Self-actualization that emphasizes personal growth such as self-esteem, self-confidence and self-efficacy and social development focuses on the importance of developing students' social skills, awareness and concerns (Kulinna & Silverman, 2000; Guan et al., 2005). Research at the elementary school level in the United States has shown that Physical Education classes provide students with a place to work together with their friends and make new friends (Patterson & Faucette, 1990). It has been found that students are more likely to develop positive attitudes if they know the benefits of Physical Education/physical activity (AL-Liheibi, 2008; Rikard & Banville, 2006) and if they believe that Physical Education can be helpful in reducing the pressure of academic success (Koca et al., 2005). Students who perceive that Physical Education is worthwhile are more likely to participate in physical activity outside school (Hilland et al., 2009; Rowe, Raedeke, Wiersma, & Mahar, 2007), whereas those who show unfavorable feelings toward Physical Education are less likely to participate (Ennis, 1996). Moreover, Tannehill and Zakrajsek (1993) observed that students did not become motivated to participate unless Physical Education teachers demonstrated to

them the benefits of physical activity in developing and maintaining healthy lifestyles. A strong positive relationship was identified by Hilland et al. (2009) at the middle school level in England between the Perceived Physical Education Worth (Physical Education benefits and usefulness) and Physical Education Ability (self-perception) factors: that is, Perceived Physical Education Ability is strongly related to Perceived Physical Education Worth and vice versa. Brustad (1993), working at the elementary school level in the United States, demonstrated a similar relationship in that perceived competence in Physical Education was positively associated with Physical Education enjoyment. Thus, if students perceive that Physical Education is fun, enjoyable, and beneficial, they are more likely to enjoy their experiences and maintain their motivation in the future.

Self-perception of their Physical Education ability. Students' self-perceptions of their motor skills affect their attitudes toward Physical Education at the high school level (Tannehill et al., 1994). Research has found that predisposing factors, such as self-ability and self-efficacy, increase the likelihood that grade 5-8 students in England will engage in regular physical activity (Rowe et al., 2007). Students with poor self-confidence and self-esteem often have negative attitudes toward performing activities in front of peers. For example, "I tried every sport, however unsuccessfully, so participating in these sports during gym class, in front of all my friends, did not thrill me." "My fitness level, which was being displayed to all of my peers, caused my self-esteem to drop drastically." Low skill students in the United States had similarly distressing encounters with Physical Education at the middle and high levels (Silverman, 1993). Unsuccessful experiences occurred more frequently for low skilled individuals and hence, many did not enjoy Physical Education or participate in physical activity at the high school level (Portman, 2003). Therefore, these authors claim, teachers should take precautions to limit potential embarrassment and promote a positive and supportive environment free from ridicule.

There is limited research on university students' attitudes earlier at the university level. Consequently, the aforementioned studies drawn from a variety of educational levels and contexts provide a reference point from which to conduct this study.

Students' Characteristics and their Attitudes toward Physical Education

The evidence presented in the literature on students' attitudes suggests that student characteristics

(e.g., grade and school level, age, and gender) are related to their attitudes. Generally speaking, positive attitudes decrease as grade levels increase (AL-Liheibi, 2008; Lee, 2004) at the higher school levels (Biddle & Mutrie, 2008), and as student age (Silverman & Subramaniam, 1999) increases. For example, AL-Liheibi (2008) reported that middle school students had more positive attitudes toward Physical Education than high school students in terms of Physical Education teachers, Physical Education curriculum, and the availability of facilities and equipment, even though the reverse result was found for the dimension of personal satisfaction about Physical Education benefits. Silverman and Subramaniam (1999) reported that young students have more positive attitudes toward Physical Education when compared to older students. Gender difference is another variable in relation to students' attitudes toward Physical Education. At the high school level in Austria, the Czech Republic, England and the United States, Stelzer et al. (2004) found that boys typically possess more positive attitudes, higher Physical Education enjoyment, and higher perceived competence than girls. Other studies, however, have not found differences in attitudes between boys and girls (Arar & Rigbi, 2009; Subramaniam & Silverman, 2000). Gender differences at the middle school level in the United States could relate to boys and girls having different perceptions of enjoyment, competence, and success in Physical Education (Subramaniam & Silverman, 2007). Another explanation involving gender is based on adiposity differences between boys and girls during their biological maturation: the increase in adiposity from approximately 15 to 22% body fat leads to the changes in body shape and size (Malina, Bouchard, & Bar-Or, 2004). Adolescent girls' responses to this physical change include reductions in self-esteem and self-perceptions and a poor body image, which have the potential to result in negative feelings about their physical activities (Davison, Werder, Trost, Baker, & Birch, 2007; Murdey, Cameron, Biddle, Marshall, & Gorely, 2004). Not surprisingly, this has been linked to a reduction in enjoyment of physical activity (Ashford, Biddle, & Goudas, 1993). In Norway, males from 13 to 23 years of age identify themselves as 'sporty' to a greater extent than females, because competition and sports are not considered as important for the latter (Kjønniksen, Fjørtoft, & Wold, 2009). In Canada, the traditional male role model involves activities such as physical strength, exertion and competition, whereas the female role involves more care-dominated activities such as social and emotional skills, and in Canadian high school Physical Education classes and

sports, the latter roles are less emphasized (Bowker, Gadbois, & Cornock, 2003). Similarly, in Delhi high schools, the possibility of different expectations and perceptions of girls and boys, given the differences in physical and emotional status, is not considered in the preparation of Physical Education programs (Arvind & Singh, 2011).

To sum up, this exploration of the literature on student attitudes toward Physical Education, and the consequent synthesis of this literature into five broad dimensions have provided a conceptual framework to inform the current investigation, which was specifically directed at students' attitudes toward Physical Education at Chinese universities. In particular, the framework underpinned the following three aspects of our investigation: guiding the construction of an instrument and data analysis; interpreting the results; and informing our discussions about the findings. This study aimed to explore the relationship between those attitudes and the students' current frequency of participation and their intended lifelong participation in physical activity, and Physical Education achievement. Four research questions were proposed:

(1) What are university students' attitudes toward Physical Education at the university level in China?

(2) What is the relationship among university students' characteristics and their attitudes toward Physical Education at the university level?

(3) What is the relationship among university students' attitudes toward Physical Education at the university level and the frequency and duration of their current participation, and intended lifelong participation in physical activity?

(4) What is the relationship between university students' attitudes toward Physical Education at the university level and their Physical Education academic achievement?

Method

Research Context

Universities in China run a 2-hour Physical Education class once per week, which is compulsory for all students in their freshman and sophomore years. The Physical Education classes in universities may include a variety of sports, but one Physical Education class only covers one sport, such as basketball, volleyball, soccer, track and field, martial arts, aerobics, swimming, skating, artistic gymnastics, table tennis, badminton, and tennis, but the availability and choice varies across universities. 'Theory of Physical

Education' is included in the Physical Education courses so that students can understand the benefits and risks of participation in sports and physical activities, their impacts on the body, and the relationship between participation and individual well being. Student assessment at the end of each semester comprises performance in sports, an examination in the 'Theory of Physical Education', and attendance, but the weightings accorded these three content areas differ between universities. This assessment is referred to in this study as 'student's Physical Education academic achievement'.

Physical Education teachers intending to teach in schools are trained at 'normal' colleges or universities in China. University Physical Education teachers are trained at four-year normal universities or at higher level specialized Physical Education institutions (Zhou, 2006). Both streams undertake equivalent years of training. Note that a 'normal' university in China is a university which trains students to become teachers, including Physical Education teachers at different educational levels. In other countries, such an institute may be located within a university and may be called a Teachers College. Physical Education teachers need to specialize in at least one Physical Education field and understand other fields as well since they may be assigned to teach courses which are not within their specific expertise. Physical Education teachers' teaching loads range from four to eight classes per week at most universities. Each university can develop a syllabus and choose textbooks and teaching materials according to their own context.

Participants and Procedure

Participants. A sample of 1200 students at four universities in China were approached and 949 valid questionnaires were returned, giving an excellent response rate of 79.1%. Out of the 949 respondents, 56.0% were female, 39.3% were from the freshman year, and the rest were from the sophomore year. There were 42.9% studying sciences (e.g., chemistry, computer information and technology, mathematics, and physics) and 57.1% studying social sciences (e.g., arts, Chinese, English, geography, history, and politics).

Procedures. The ethics application for this project was approved by the first author's university. Researchers phoned the chair of the Physical Education department at the four universities and visited the four chairs who agreed to participate. The researchers briefed each chair with a written Participant Information Sheet, and asked for permission to conduct the research, including distributing questionnaires and collecting students' Physical Education performance information for the current term. Once each chair

had signed a consent form, they were asked to call for teacher volunteers within their department. Teacher Participant Information Sheets and consent forms were then distributed to teacher volunteers by the chairs. Once the teachers had signed the consent forms, they were asked to distribute Student Participant Information Sheets and the questionnaire to their students. Students were asked to return them directly to the researchers within four weeks using the addressed stamped envelopes supplied with the questionnaires. They could also return them to the drop-box that was located at the Physical Education department of each university.

Instrument

An instrument, the Students' Attitudes Toward Physical Education (SATPE), was developed for this study based on the reviewed literature (e.g., Arar & Rigbi, 2009; Guan et al., 2005; Keating & Silverman, 2004; Subramanian & Silverman, 2007) and verified using a content validity procedure (Lynn, 1986). The major reason why this study did not directly adopt an instrument from other studies is that an instrument tends to be constructed within a particular cultural environment and is likely to be idiosyncratic because the formulation of items is related to that particular culture (Poortinga, 1989). The content validity of the instrument in this study was evaluated to examine whether all important aspects of attitudes toward Physical Education were covered, to identify whether all items were essential, and to eliminate items undesirable to a particular construct domain (Straub, Boudreau, & Gefen, 2004). Lynn (1986) described a two-stage process for the establishment of instrument content validity. This two-stage process includes a developmental stage and a judgment stage.

The developmental stage. The first stage focused on defining attitudes toward Physical Education, generating content domains (dimensions) in each component, and developing an item pool for each domain. Two methods are commonly used to create content domains and relevant items in the instrument. The first method requires pooling relevant items from previous studies on the topic and then generating new items. The second method begins by gathering items and domains from target respondents. The advantage of employing both methods to generate content domains and items in each domain is that it ensures that all relevant items and possible content domains are taken into consideration at the beginning of the instrument development (Keating & Silverman, 2004). Hence, both of the methods were used to

generate the content domains and the items in each domain in this study. Following an extensive review of the literature, the initial dimensions proposed were: Physical Education Curriculum, Physical Education Teachers, Physical Education Teaching, Physical Education Benefits, and Self-Perceptions of Physical Education Ability. Items were then generated to enable assessment of each of the five content domains generated from the literature and 35 items regarding SATPE at the university level in China were identified. Five volunteer students from two of the studied universities were asked to ascertain whether each statement was sufficiently clear and relevant to describe their attitudes toward Physical Education at the university level, to see whether important points or domains had been omitted from the statements, and to decide whether a statement should be excluded from the instrument. Among these five students, two were females, three were sophomores, and two were freshmen. Three out of five studied science and two studied social science. According to their recommendations, two statements were added, four were revised, and there were no recommendations in terms of the content domains. Hence, 37 items were kept in the five-dimension instrument.

The judgment stage. The judgment stage was concerned with item validity and domain validity, with three experts (Physical Education professors) from the Chinese universities and the five aforementioned student participants (Bohrnstedt, 1992). Initially, the three professionals were invited to check item validity and domain validity. A quantitative sorting-process was conducted to examine whether the statements fit with the instrument assessing students' attitudes toward Physical Education and whether the statements were in line with the five corresponding dimensions. First, they were asked to indicate whether they thought these statements should be included in the instrument (1=*No*, 2=*Maybe*, 3=*Yes*) and how confident they were about that (*1=not very sure*; 2=*Sure*; *3=very sure*). A minimum of two of the three judges had to agree that a statement belonged to the instrument (where 3=*yes*) and the mean confidence score had to be greater than 2.0 (where 2>*sure*). Then, the judges were asked to associate each of the 37 items with one of the five dimensions and to indicate how confident they were that their selection was related to the particular content domain. The rating scales and criteria for domain validity were the same as the item validity criteria. As a result, two statements were discarded because of unsatisfactory confidence ratings, four were revised, and two items were moved from one content domain to another. Hence, 35 items were kept in the

instrument and classified into the five original dimensions: Physical Education Curriculum, Physical Education Teachers, Physical Education Teaching, Physical Education Benefits, and Self-Perceptions of Physical Education ability.

The same five volunteer students from the sample population were also then invited to check item validity and domain validity based on the experts' classification. The same procedures and regulations were adopted. As a result, two further items were revised.

The SATPE instrument now had three parts with 35 items about the attitudes toward Physical Education at Chinese universities. Part 1 comprised 35 items regarding SATPE in Chinese universities. The participants were asked to indicate how strongly they agreed with each statement describing attitudes toward Physical Education. They were asked to respond to a six-point, positively-packed agreement rating scale. This response scale included two negative and four positive agreement responses with identical scores (e.g., *strongly disagree*=1, *mostly disagree*=2, *slightly agree*=3, *moderately agree*=4, *mostly agree*=5, and *strongly agree*=6). Positively-packed rating scales are known to generate discrimination in contexts of social desirability (Brown, 2004; Lam & Klockars, 1982), which is especially expected within Chinese psychology (Bond & Hwang, 1986). The following are example questions: a) Physical Education classes are helpful to improve my levels of health and fitness; b) Physical Education classes are helpful to gain confidence in participation in physical activity; c) What I have learned in Physical Education classes is useful for me; d) My Physical Education teacher is highly professional and good at Physical Education sports; e) My Physical Education teacher encourages us to take ownership of performing tasks on our own. Further items are given in the full outline of the model (see Figure 1). Part 2 included three questions regarding students' current participation frequency in physical activity outside Physical Education curriculum, the duration of their current participation outside Physical Education curriculum, and their intended lifelong participation in physical activity outside Physical Education curriculum. In Part 3, students were asked to give their personal demographic information and their Physical Education academic achievement scores for the semester.

Data Analysis

Variables and cases with more than 5% missing values were removed and values for missing responses were calculated using the expectation maximization (EM) missing value procedure (Dempster, Laird, & Rubin, 1977). All 37 items had fewer than 5% missing values so they were kept for analysis. However, 14 cases with more than 5% missing values were removed and 949 were kept for analysis. The distribution for each item was checked using descriptive statistics. One of the variables had skewness greater than 1.0, and was excluded from subsequent analyses. For the remaining variables, skewness values ranged from -.78 to .95, and kurtosis ranged from -.87 to .89. Normality of the data was deemed acceptable for further analysis (Meyers, Gamst, & Guarino, 2006). Mean scores for each factor were obtained through Descriptive Statistics or Compare Means (see more details in the Results section).

Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were employed to analyze the data. The analysis had three steps. CFA was firstly utilized to test the proposed five-dimension model (e.g., Physical Education Curriculum, Physical Education Teachers, Physical Education Teaching, Physical Education Benefits, and Self-Perceptions), but the model did not have an acceptable fit to the data. In the next two steps, a cross-validation method (Gerbing & Hamilton, 1996) using EFA and CFA to generate and then to confirm another five-dimension model which this time contained Physical Fitness, Self-Actualization and Social Development, Physical Education Curriculum, Physical Education Teachers, and Physical Education Teaching. More specifically, EFA was used on one randomly selected half of the sample (474) to generate a new exploratory model, and CFA was used on the other half (475) to test the replicability of the modified model. Please note that this sub-sample in the CFA procedure was utilized to calculate the descriptive statistics in the result section since the final model was identified using this sample. An advantage of the cross-validation method is that it allows the testing and modification of the exploratory model on an independent subset of the sample (Gerbing & Hamilton, 1996). EFA with principal axis factoring and factor extraction using SPSS 21 was employed to deal with the items and generate a five-factor model (Costello & Osborne, 2005). The five factors with eigenvalues greater than 1.0 explained 43.19% of the total variance. Items were removed that had loadings smaller than .30 on their intended conceptual factors (dimensions) or which did not match logically and conceptually with other items in the same factors. In this procedure, four items were discarded and 31 items were included in the

exploratory SATPE model. In the new five-dimension model, the three dimensions, Physical Education Curriculum, Physical Education Teachers, and Physical Education Teaching, were the same as those in the proposed model. However, the two dimensions, 'Physical Fitness' and 'Self-Actualization and Social Development', were identified based on factor loadings in EFA and empirical findings on teachers' attitudes toward curriculum in Physical Education by Guan et al. (2005). CFA using Amos 20 (IBM, 2011) was utilized to test the items in the model (Anderson & Gerbing, 1988). The CFA procedure deleted four items because of lower factor loadings (<.30) and one item because of the non-significant regression path. In the end, a 26-item, five-factor, inter-correlated model of SATPE was formed.

According to general recommendations for selection in psychometric theory and applied multivariate research, most fit indices are sensitive to different conditions (e.g., sample size, model complexity, or model misspecification), thus it is recommended that multiple fit indices are reported when assessing model fit (Byrne, 2010; Fan & Sivo, 2005). For example, the χ^2 statistic is extremely sensitive to large sample size and violation of normality. Some goodness-of-fit indices (e.g., Tucker-Lewis Index and Comparative Fit Index (CFI) are overly sensitive to complex models, that is, those with more than three factors or with a hierarchical structure (Cheung & Rensvold, 2002). The most popular index, the root mean square error of approximation (RMSEA), is sensitive to complex models and specification error (Fan & Sivo, 2007). In contrast, the standardized root mean square residual (SRMR) and gamma hat have been shown to be relatively resistant to the impact of large samples, complex models, and model misspecification (Fan & Sivo, 2007).

In this study, five absolute and incremental fit measures were employed to evaluate the data fit to the model: (1) the χ^2 package (p, χ^2/df); (2) CFI; (3) RMSEA; (4) SRMR with 90% CI; (5) gamma hat. In terms of the cut-off values for the above indices, acceptable fit occurs when χ^2 is roughly equal to its df and good fit is inferred when the ratio of χ^2 to df has $p>.05$. When RMSEA and SRMR are $\leq.05$, fit is good and when $\leq.08$, it is acceptable. When the 90% CI for RMSEA falls in the range from .050 to .080, fit is acceptable. When CFI and gamma hat are $\geq.95$, fit is good and when they are >.90, fit is acceptable (Byrne, 2010; Marsh, Hau, & Wen, 2004). In addition, items that still had low loadings (<.30) on their conceptual factors or which had strong modification indices to other factors were removed in the CFA procedure (Meyers et

al., 2006). Accordingly, three items were removed and a model with 26 items was tested. It frequently happened that the fit indices were not within an acceptable range, so modification indices (MI) were used to identify which items were unfit. As a rule of thumb, larger values of MI suggest that the corresponding modification may result in a greater improvement in the fit (Meyers et al., 2006). Therefore, items with a larger MI are considered problematic so these unfit items were then discarded and a different model was tested. Two items were removed in this procedure and a final model of 26 items was generated.

Results

SATPE Model

As a result of the EFA and CFA procedures, a five-factor model of SATPE with 26 items was identified with a good fit (χ^2=789.55, *df*=294, χ^2/*df*=2.69, *p*=.00; RMSEA=.060, 90% CI=.055~.065; SRMR=.054; CFI=.90; and gamma hat=.92) (see Figure 1). The five dimensions comprised Physical Fitness, Self-Actualization and Social Development, Physical Education Curriculum, Physical Education Teachers, and Physical Education Teaching. Please see the questions in detail in Figure 1.

Internal consistency reliability coefficients (α) for the five factors ranged from .70 to .85 with an average mean of .76 (see Table 1). Internal consistency reliability coefficients for each individual factor were also calculated: .90 for Physical Fitness, .77 for Self-Actualization and Social Development, .85 for Physical Education Curriculum, .80 for Physical Education Teachers, and .80 for Physical Education Teaching. These values indicate that the items were sufficiently consistent within each factor and the factors were sufficiently consistent within the model so as to permit meaningful further analysis. The significant inter-correlations between these five factors ranged from .22 to .65 with an average of .36 (see Figure 1). These indicate that the factors were moderately correlated, thus, relatively independent of each other. The two factors relating to Physical Education Benefits, Physical Fitness, Self-actualization and Social Development, were strongly correlated. Descriptive results regarding factor mean scores were calculated. In general, students had positive attitudes overall. They reported the most positive attitudes toward Physical Fitness (*M*=5.25, *SD*=.71), followed by Self-actualization and Social Development (*M*=5.14, *SD*=.82), and Physical Education Teachers (*M*=4.95, *SD*=.80), Physical Education Curriculum

and Status (*M*=4.86, *SD*=.91). The lowest mean was Physical Education Teaching (albeit still positive, *M*=4.79; *SD* =. 80) (see Table 1).

SATPE and Student Characteristics

Student characteristics (e.g., students' gender, grade level, major, and university) were examined as a possible source of variance in students' attitudes toward Physical Education. MANOVA was utilized to respond the 2nd research question on the relationship among university students' characteristics and their attitudes toward Physical Education. MANOVA is appropriate when several dependent variables measure different aspects of a cohesive theme and dependent variable intercorrelations are moderate. If sample sizes are fairly equal for each group, MANOVA has been shown to be robust to violations in terms of Type I error, particularly with a large sample size (French, Poulsen, & Yu, 2002). These are the cases for this study - five dependent variable (dimensions), moderate intercorrelations, a large sample size, and fairly equal sample sizes for each group. Hence, MANOVA is appropriate to respond the 2nd research question in this study.

MANOVA with main effects found that gender and the college major that students were studying led to statistically significant mean differences in their attitudes toward these factors (gender: $F_{(6,466)}$=4.11, p<.01, Wilk's λ=.94; college major: $F_{(6,466)}$=4.17, p<.05, Wilk's λ=.97). By contrast, grade and university did not have an effect on students' attitudes. Cohen's *d* effect size was used to examine the degree of mean difference for gender and college major. Cohen (1988, 1992) provides guidelines that indicate effect sizes of .10, .30, and .50 should be termed small, medium, and large respectively. As for gender, male students (*M*=5.11, *SD*=.81) held more positive attitudes toward four factors than female students (*M*=4.90, *SD*=.68) and held a similar mean score for only one factor (Physical Education Curriculum). Effect sizes ranged from .04 to .44 with an average effect of .25. According to Cohen's (1988, 1992) recommendation, most effect sizes were small and only two effect sizes (e.g., Self-actualization and Social Development, *d*=.44; Physical Fitness, *d*=.30) were medium. Students studying social science (*M*=5.11, *SD*=.69) tended to agree more with four factors than those studying science (*M*=4.95, *SD*=.74), but tended to agree equally with one factor of Physical Fitness. Effect sizes ranged from .01 to .48 with an average effect of .20. Most effect sizes were small and only two effect sizes were clearly of medium size: Physical Education Teachers

(*d*=.48) and Physical Education Teaching (*d*=.31). The consistency of the mean level of endorsement for these five factors across student characteristics suggests that the model identified in this study taps into stable priorities of how Chinese university students conceive of Physical Education.

SATPE and Participation in Physical Activity

In Part 2 of the model, there were three questions used to investigate the frequency and the duration of students' current participation, and intended lifelong participation in physical activity outside the curriculum. According to the responses to the frequency of current participation, 29.4% out of 475 (the half sample for the CFA procedure) students responded that they did not participate in any physical activities outside the curriculum, 29.6% students participated once per month, 19.8% participated once per two weeks, 12.6% participated once per week, and 8.6% participated twice per week or more. Spearman rank-order correlation analysis indicated a positive moderate association (r=.48, p<.01) between students' overall attitudes and their current participation. From descriptive results for mean scores, students who held higher attitudes toward Physical Education were more likely to participate more frequently in physical activity (students who participated in physical activity more than once per week: M=5.21, SD=.75) and students who held lower attitudes were more likely to participate less in physical activity (students who participated in physical activity less than once per two weeks: M=4.93, SD=.67). Effect size for the two groups (i.e., students who participated in physical activity more than once per week; students who participated in physical activity less than once per two weeks) was .49 (p<.01) on the question of the frequency of students' current participation in physical activity outside the curriculum. This effect size indicated mean differences were clearly medium.

As for the duration of their participation, 29.5% of the students responded as '0', 53.2% students participated for less than one hour, 12.1% students participated for one to one and a half hours, and 5.2% students participated for more than one and half hours. Correlation analysis indicated a positive moderate association (r=.42, p<.01) between students' overall attitudes and the duration of current participation. Students who were more likely to agree with the statements of Physical Education (M=5.69, SD=.50) participated for a longer time. Effect size for the two groups (i.e., students participated for less than one

hour; students participated for more than one hour) was .45 (p<.01) indicating of medium sized differences between these two groups.

When asked about whether they would like to participate in 'lifelong' physical activities, 3.7% students responded that they would definitely not want to participate, 44.4% students responded 'not sure', and 51.9% students reported that they would like to participate in lifelong physical activities. Correlation analysis showed a small association (r=.19, p<.01) between students' overall attitudes and their intended lifelong participation. Students who reported more positive attitudes toward Physical Education also reported that they were more likely to participate in lifelong physical activities with a small effect size (d=.19, p>.05) between the groups.

SATPE and Physical Education Academic Achievement

In Part 3, Physical Education academic achievement data from the semester were collected. There were 1.2% students who scored under 60 which means 'failed', 33.6% students' scores ranged from 60 to 79 which means 'pass', 42.1% students' scores ranged from 80 to 89 which means 'good', and 23.1% students gained 90 or above which means 'excellent'. Correlation analysis showed a moderate association (r=.66, p<.01) between students' overall attitudes and their Physical Education achievement. The students who held the highest mean score tended to gain 'excellent' for their Physical Education performance (M=5.46, SD=.67) and students who held the lowest mean score were more likely to gain 'fail' (M=4.01, SD=.54). Effect sizes for any two out of four groups (i.e., students who scored under 60; students' scores ranged from 60 to 79; students' scores ranged from 60 to 79; students gained 90 or above) ranged from .35 to .70, which indicated that mean differences were of medium or large size. It seems that the students who performed academically better in their Physical Education classes tended to agree more with the statements of five dimensions in the instrument.

Discussion

This study responded to four research questions about university students' attitudes toward Physical Education in China, and the relationship of those attitudes to students' characteristics, their current and lifelong participation in physical activity as well as their Physical Education academic achievement. A model of students' attitudes toward Physical Education comprising five dimensions was conceptually and

empirically developed. The findings in this study indicate that students' attitudes toward Physical Education have a significantly positive moderate association with the frequency and duration of their current participation in physical activity, a small association with their intended lifelong participation, and a significantly positive moderate association with their Physical Education academic achievement. Students' gender and the college majors that they were studying led to statistically significant differences in their attitudes toward Physical Education.

Understanding University Students' Attitudes toward Physical Education

This survey of Chinese university students established a five-factor model in understanding students' thinking about Physical Education at the university level. This study also addressed the differences between these university students' attitudes with regard to their gender and college majors. Overall, the findings of this study suggest that university students had moderately positive attitudes toward Physical Education. They agreed strongly with physical, personal and social benefits of Physical Education and most weakly endorsed the importance of the teacher (albeit still positive).

The students gave highest priority to the domain areas of physical, personal and social benefits, which indicates that the students placed the highest priorities on these domain areas. The two dimensions-'Self-Actualization and Social Development' and 'Physical Fitness' in the model demonstrated that Physical Education could contribute to developing motor skills, improving health level and body shape, and promoting personal perfection and social inclusiveness. These support findings from other studies that have claimed that students have positive attitudes when they are aware of the benefits of Physical Education /physical activity (Patterson & Faucette, 1990; Rikard & Banville, 2006) and when they believe Physical Education would be helpful to reduce their academic stress levels (Koca et al., 2005). Participants holding the most positive attitudes in these two dimensions may be a reflection of Chinese health history. Before 1949, China was considered by world standards to be a nation with poor health conditions and low fitness (China Handbook Editorial Committee, 1983). It is not surprising that the Chinese government has placed a high value on improving people' health and fitness levels and the Physical Education program has been giving priority to improving students' health and fitness across their schooling experiences from elementary to university level (Guan et al., 2005). Under these circumstances, it is logical that Chinese

students might understand the benefits of Physical Education and believe these could contribute to their health.

Note that Self-actualization and Social Development also included items involving building confidence, knowing more friends, and promoting a sense of responsibility. The only-one child policy in China has led to a society where many adults (e.g., parents and grandparents) dote on their only child who is likely to have been brought up in isolation from peers or others and lacks personal confidence and responsibility to him/her and society (Wang et al., 2008). When students share experiences with their peers and learn from each other (Bernstein, Phillips, & Silverman, 2011), it provides them with a comparison for personal competence (Horn & Amorose, 1998), companionship, and recognition of success (Duncan, 1993). Therefore, it is a good sign that university students were positively rated the personal and social benefits of Physical Education in order to promote their immediate and lifelong participation in physical activity. In addition, it aligns with the aims of the Physical Education curriculum in China which states that Physical Education should focus on fostering students' physical, social, and emotional development, and also on promoting healthy lifestyles, lifelong learning and social inclusion (Du, 2010; Guan et al., 2005).

The Physical Education Curriculum was identified as one of the determinants of student attitudes. Students did confirm some positive points such as the importance of Physical Education and the usefulness of Physical Education content. However, they were also concerned that the status of Physical Education needs to be improved, assessment needs to be seriously considered, and Physical Education should provide opportunities for all students rather than the minority of students who are good at sports. With regard to the status of Physical Education, this finding is supported by Omar-Fauzee et al. (2009) who reported that Physical Education should be made a compulsory subject and offered at all levels of education, and by Van Wersch et al. (1992) who found that the status of Physical Education as a school subject was the most important contributor to interest in Physical Education. The students agree that Physical Education should be in the curriculum because it is important as a stepping stone for them to get actively involved in physical activities (Omar-Fauzee et al., 2009). As for curriculum content, Carlson's (1995) participants expressed a desire to learn 'new things' and experience 'the variety in more elective choices' whereas students in this study sought the 'useful stuff'. No matter which aspect they prefer, curriculum content is one of the

influential elements in the development of students' attitudes toward Physical Education (Luke & Sinclair, 1991; Rikard & Banville, 2006).

The domains Physical Education Teachers and Physical Education Teaching, although given the least priority, were still considered important. Students in this study would like their Physical Education teachers to have a high level of content knowledge and pedagogical knowledge, and a passion for, and a commitment to, Physical Education. Other studies also found the teacher plays an important role in student learning, motivation and positive attitude development (Koca et al., 2005; Rikard & Banville, 2006). More specifically, a highly skilled and devoted Physical Education teacher has the potential to encourage students to participate in Physical Education classes and outside of classes (Arar & Rigbi, 2009). The teacher is a role model for their students. Hence, their passion for the subject would transmit to their students and have a positive impact on them. A prominent idea, creating a supportive and changing environment in Physical Education classes, concurs with other literature (Hilland et al., 2009; Ravizza & Stratton, 2007; Subramaniam & Silverman, 2007).

Students' characteristics and their attitudes. Our findings indicate that student characteristics, gender and college major, led to significant differences in students' attitudes, but grade and university was not associated with their attitudes. Students' attitudes toward Physical Education were affected by their gender and the college major that they were studying. Male students were more positive than female students, especially toward the 'Physical Education Benefits' dimension. This finding concurs with results from other research on student attitudes, namely, reporting that boys had more positive attitudes than girls (Koca et al., 2005; Omar-Fauzee et al., 2009), whereas it is inconsistent with the findings of several other studies (Arar & Rigbi, 2009; Subramaniam & Silverman, 2007). As mentioned in the literature, such gender differences in Chinese university students may be attributed to boys and girls having different perceptions of enjoyment, competence, and success in Physical Education (Subramaniam & Silverman, 2007), of competition and sports (Bowker et al., 2003), of expectations about activities (Arvind & Singh, 2011), and of adiposity changes during their biological maturation (Malina et al., 2004).

Students' attitudes toward Physical Education in this study also differed in relation to the college majors they studied. Students studying social science held more positive attitudes than students from science majors, especially for Physical Education Teachers and Physical Education Teaching, which had moderate effect sizes. Unfortunately, there are no similar studies that could be identified to be a reference regarding this point.

Perhaps surprisingly, no significant differences in terms of students' attitudes to Physical Education occurred according to grade and university. As for student's grade, one plausible explanation is that Physical Education classes in the freshman year and the sophomore year in Chinese universities are fairly similar. They have the same curriculum objectives and goals, assessment methods, and elective choices for the topics. The teachers could be the same (if a teacher teaches more than one topic) or different. The only difference is that students in their first or second year at the university select different classes each year. It has been found that the same types of activities and tasks may bring similar levels of enjoyment to students at different grade levels (Chen, Darst, & Pangrazi, 1999) and the repetitive and prescriptive nature of the Physical Education National Curriculum (Ntoumanis, 2001) may contribute to this discrepancy. This, however, needs further investigation. The university in which the students studied did not lead to differences in students' attitudes in this study. This may be related to the Chinese university educational system where curriculum objectives and goals are systematic, consistent and mandatory from the Ministry of Education. Chinese society emphasizes a collectivist tradition where individualism and self-expression are generally discouraged. Teachers typically form and develop similar teaching ideas and styles nationwide (Guan et al., 2005). By and large, the predominant style of teaching is what Mosston and Ashworth (1994) would call the 'command style'. The effects of state mandates and the collectivist tradition may explain why this style of teaching is so prevalent across universities in China.

Understanding the Relationship of SATPE to Student Participation

Students' attitudes toward Physical Education had a significantly positive moderate association with the frequency and duration of their current participation, but had a weak relationship with their intended lifelong participation in physical activity outside the curriculum. Empirically, this view is also supported by data from other studies, suggesting that students who exhibit a more positive attitude to Physical Education

are more likely to participate in physical activity outside of school than those with less positive attitudes (Kjønniksen et al., 2009). This study signals a weak association (albeit significant) with students' intended lifelong participation, which is congruent with other results showing a weak relationship with lifespan participation (Kirk, 2005; Trudeau & Shephard, 2005). As Malina (2001) argued, what actually influences lifespan participation is very complex. It may reflect the influence of other factors such as education, occupation, living environment, marital status, having children and lifestyle attitudes.

Understanding the Relationship of SATPE to Students' Physical Education Achievement

The results show that students' attitudes toward Physical Education had a significantly positive moderate association with their Physical Education academic achievement. Students who held higher attitudes were more likely to gain higher Physical Education scores at the end of that semester. It is reasonable to believe that students may transfer skills, confidence, and enjoyment evolving from their engagement in Physical Education, which may help them achieve better academic results in Physical Education (Kjønniksen et al., 2009). This is congruent with some findings from other studies which state that students' attitude toward Physical Education, as a mediating variable, could predict a holistic understanding of students' Physical Education achievement (Graham et al., 2007; Lee, 2004; Subramaniama & Silverman, 2007).

In summary, students' positive attitudes toward Physical Education identified in this study could be relevant to their current level of participation and their Physical Education achievement, though not directly linked to their intended lifelong participation. Hence, inclusion of students' attitudes toward Physical Education does aid in understanding students' Physical Education achievement and their current participation in physical activity. Consequently, these attitudes formed toward Physical Education may play an important role in challenging students' sedentary lifestyle and, instead, promote a physically active lifestyle outside school.

Implications

Student attitude is an important construct that warrants attention from teachers, researchers, and policymakers (Subramaniama & Silverman 2007). Student voices regarding their attitudes toward Physical Education can provide valuable information about what they think and feel about their Physical Education

(Graham, 1995). Physical Education teachers should take student voices into account when they strive for educationally appropriate pedagogy and curriculum modifications aiming at enhancing students' participation in Physical Education and Physical Education achievement, and achieving teacher effectiveness. In this study, the five dimensions in the SATPE model were carefully evaluated. More specifically, Physical Education teachers should think about how to select the most up-to-date, useful curriculum content and encourage students to understand Physical Education benefits. Arranging a sound set of activities to meet all students' needs and to engage students in learning also needs to be considered. In addition, Physical Education teachers are responsible for building up students' confidence and sense of responsibility for their learning through creating a supportive and comfortable learning environment for all students. When planning and implementing these modifications, it is suggested that Physical Education teachers be more aware of students' gender and college major differences.

Our results indicate that researchers and policy makers should develop intervention studies to uncover a more thorough understanding of student attitude, promote more positive attitudes toward Physical Education and, in the process, help students to adopt physical activity, fitness, and health awareness as lifelong habits. Certainly the complex relationship between students' attitudes and their lifelong participation in physical activity requires further elucidation.

The findings of this study can also contribute to Physical Education curriculum modifications and help policy makers and researchers in their efforts to plan and manage a more effective and improved Physical Education curriculum. In particular, studies in India found different expectations and perceptions of girls and boys regarding their different physical and emotional status that are not usually considered in the preparation of Physical Education programs (Arvind & Singh, 2011), and this may also be the case in Chinese university Physical Education programs. This could then lead to a series of professional development programs, hopefully resulting in improvements to Physical Education teaching, and, hence, to changing student attitudes and opportunities for learning gains. If we can change students' attitudes toward Physical Education, we may be one step closer to reducing the number of adults who risk the hazards of a sedentary lifestyle (Stelzer et al., 2004; Zeng et al., 2011). This study could also inform the development of intervention programs regarding Physical Education teaching, Physical Education teacher professional

development, and curriculum modification at the university level in China, resulting in improving Physical Education teaching and promoting good Physical Education experiences for students at university. This may ultimately develop into achieving active lifestyles for today's Chinese youth.

Finally, this research has provided a lens for Western researchers to understand more about Physical Education at Chinese universities, and about students' attitudes toward Physical Education generally since Physical Education at Chinese universities is very different from in the West. Indeed, adding the Chinese perspective could help paint a broader, more accurate picture of Physical Education worldwide.

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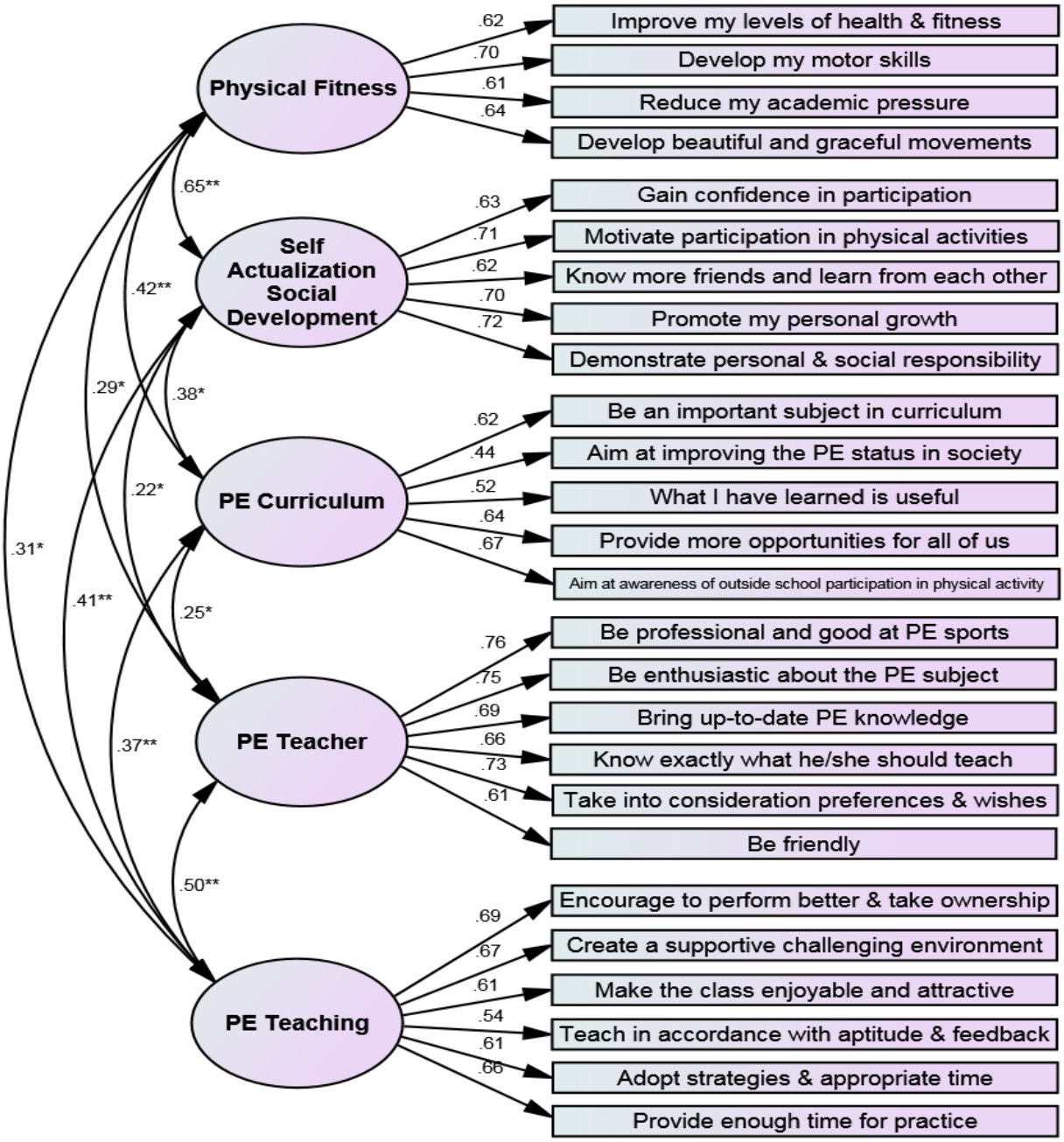

Figure 1. The model of students' attitudes toward Physical Education in Chinese universities.

Please note that all factor loadings shown in Figure 1 are standardized factor loadings.

**=p<.01; *=p<.05 (two-tailed test).

941 Table 1
942 *Factor Means and Coefficient Alphas*

Factor	*M*	*SD*	Alpha
Physical Fitness	5.25	.71	.85
Self-Actualization and Social Development	5.14	.82	.70
Physical Education Curriculum	4.86	.91	.78
Physical Education Teachers	4.95	.80	.75
Physical Education Teaching	4.79	.80	.72

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