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PHYSICAL EDUCATION

An Examination of University Students' Attitudes Toward Physical Education and Their Sport and Physical Activity Preferences

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Abstract

The purpose of this study was to examine factors that form university students' attitudes toward physical education (ATPE), the preference of their physical activities (PA), and correlation features among all related factors that form their ATPE. Participants were 1,386 university students from six universities in China. An Adapted Attitudes Toward Physical Education and Physical Activity Preferences Questionnaire was employed in data collection. Data analyses included a 2 × 2 × 2 MANOVA and correlation analysis. The results revealed the ATPE mean-scores ranking (e.g., No. 1 "keep physically fit and strong" and No. 2 "good posture and sturdy body"). Significant differences exist in ATPE mean scores between genders with males scoring higher than females and between majors with natural science scoring higher than

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social science. The PA preferences ranking of the students was team sports, weight lifting, individual sports, aerobic exercise, dual-game sports, and martial arts. Relationships between ATPE and PA in the university students were exposed and analyzed. The reasons behind these findings were discussed.

Over the last 20-plus years, many researchers have accomplished substantial works regarding how young peoples' attitudes toward physical education (ATPE) influence students' engagement in physical activity (PA) at different school levels. The overall findings from those studies indicate the following factors significantly impact students' ATPE: teachers' behaviors; instructional knowledge and skills; types of physical education (PE) curriculum; the atmosphere of classroom, gymnasium, or field; and effectiveness of the PE program. Specifically, researchers have found that the impacts on students' ATPE and their sport and PA engagement were highly related to social factors, including family, peers, media, PE and sport experiences, skill level, and perceptions of fitness; cultural factors, including gender, idolizing elite sports figures, and body and mind distinctions; and school factors, including teacher behaviors, curriculum content, school facilities, equipment, and environment (Carlson, 1995; Chung & Phillips, 2002; Zeng, 2012).

The reasons for increasing interest in the body of knowledge about young people's ATPE might be attributed to the influence of attitudes toward further participation in PA after school (Marques et al., 2011; Mercier et al., 2017; Papaioannou, 1994; Silverman & Ennis, 2003; Subramaniam & Silverman, 2000, 2002, 2007; Tannehill et al., 1994) and out of school related to students' achievement in athletic activities (Lee, 2004; Malina, 2001a, 2001b; Marques et al., 2011). The literature has also reported that students tend to continually participate in the sports or physical activities they perceive as fun and enjoyable (Marques et al., 2011; Mercier et al., 2017; Subramaniam & Silverman, 2002; Telama et al., 2005; Zeng, 2012; Zeng et al., 2009).

Literature Review and Theoretical Framework

Attitudes serve individuals in the following aspects: (a) guide their behavior toward valued goals and away from aversive events; (b) help them to manage and simplify information; (c) allow them

to communicate information about their personality and values; and (d) protect them from unacceptable or threatening thoughts, urges, and impulses (Katz, 1960). The link between attitudes and behavior has received much attention, and it is believed that attitudes are influential to behavior (Biddle & Chatzisarantis, 1999). Theoretically, the relationship between attitude and behaviors is not singular, but multidimensional. With this concern, Biddle and Chatzisarantis (1999) described that in predicting behavior, attitudes are only part of a more complex decision-making process wherein other factors such as values, beliefs, intentions, and perceptions of control can also be the dimensions of influence—and all these dimensions form the attitude–behavior relationships. Moreover, researchers have pointed out that attitudes are born from beliefs that a person has about themself and things. Attitudes shape a person's behaviors in many ways and determine their involvement in their daily activities (Rikard & Banville, 2006).

With regard to the theoretical framework, Ajzen and Fishbein (2000) developed a theoretical framework named the theory of reasoned action; it explains the relationships among attitudes, intentions, and future behavior, and it asserts that human action is determined by the intention that is influenced by attitudes and social norms as well. Furthermore, Ajzen and Fishbein indicated, while attitudes are influenced by beliefs and values, social norms are influenced by the beliefs of significant others and the motivation to comply with the beliefs of others. The theory of reasoned action implies that the interplay of all these variables guides behavior. This theory asserts that attitudes influence behavior; as a result, researchers in the field of PE have historically examined students' ATPE in the hopes of enhancing students' interest in PE and PA.

Many researchers have done remarkable works regarding the influence of students' ATPE on their PA participation. These include Figley (1985), Dunlavy (2008), Lee (2004), Luke and Sinclair (1991), Olafson (2002), Solmon (2003), Subramaniam and Silverman (2007), Zeng (2012), and Zeng et al. (2016). In summary, these studies have found that teachers' behaviors, curriculum content, class atmosphere, dressing out, self-perception, and quality of the PE program impact students' ATPE. In particular, two research studies have found the impacts on students' ATPE and sport and PA participation

were highly associated with the following factors in a consistent way: (a) *cultural*, including gender, idolizing elite sports figures, and body and mind distinctions; (b) *social*, including family, peers, media, PE and sport experiences, skill level, and perceptions of fitness; and (c) *school*, including major, teachers, curricula, facilities, equipment, and environments (Carlson, 1995; Zeng, 2012; Zeng et al., 2016).

A large number of the studies have been done in K–12 school levels, whereas an extremely limited amount of studies have been done at the college/university level concerning college/university students' ATPE, with the exception of a survey study by Zeng et al. in 2016. Their main findings were

> some factors/items scored higher and had more impact on the participants' ATPE; e.g. "physically fit and strong"; "good body shape"; and "feelings about PE class". A significant difference exists in 'Gender' and 'Majors' variables, wherein 28 out of 40 comparisons reached significant differences ($p < .05$). (p. 1)

Zeng et al. (2016) concluded that in their investigation the college students did not have positive ATPE. Gender and major are important aspects that form and impact college students' ATPE differently. The males had more positive ATPE than the females, and the students from natural sciences possessed more positive ATPE than the students from social sciences.

This raises the question, if we have no idea the current status of university students' ATPE, how can we possibly provide enjoyable and helpful PE curricula and PA plans and programs for this extremely important group of the population? Research on PE and healthy lifestyle has suggested that it is critical to identify and understand the factors that motivate or drive young people to take part in physical exercises regularly, and that to promote a healthy lifestyle among the young people it is key to know and change their ATPE (Chung & Phillips, 2002; Dunlavy, 2008; Hagger et al., 2002; Solmon, 2003; Subramaniam & Silverman, 2007; Zeng et al., 2016). Students who possess more positive ATPE were reported to be more likely to take part in regular PA outside of school (Biddle & Chatzisarantis, 1999; Chung & Phillips, 2002; Dunlavy, 2008) and to demonstrate higher PA amounts and physical exercise loads (Chung & Phillips,

2002; Hagger et al., 1995) than students who possess negative ATPE or have less positive ATPE.

Definitions of Attitudes and Attitude Toward Physical Education

According to researchers in psychology, the definition of an attitude refers to a person's mental state, which is based on their value system or what they believe, their emotions, and their tendency to act in a confident way. In brief, a person's attitude reflects how they think, feel, and behave in a particular situation (Solmon, 2003). Moreover, Winston Churchill clearly indicated, "Attitude is a little thing that makes a big difference."

> Attitude can be defined as our response to people, places, things, or events in life. It can be referred to as a person's viewpoint, mindset, beliefs, etc. Our attitude towards people, places, things, or situations determines the choices that we make. Attitude is composed of three components, which include cognitive component, the emotional component, and the behavioral component. (Psychologenie, n.d., para. 3)

Essentially, the cognitive component is based on the information or knowledge an individual has or receives on a particular event, whereas the emotional component is grounded in the feelings of the person. The behavioral component, however, reflects how the attitude impacts the way an individual acts or behaves (Psychologenie, n.d.). Given these concepts and principles, ATPE should be defined as a person's attitude toward PE based on their beliefs and values and their experiences in PE that inform their emotions and tendency on the actions whenever they participate in PE. In brief, a person's attitude toward PE reflects how they think, feel, and behave in a given PE and PA situation.

Purposes and Research Questions

After a thorough search on the research database about ATPE studies, the results showed that most of the studies were done at primary and secondary school levels (e.g., Carlson, 1995; Chung, & Phillips, 2002; Ding et al., 2006; Folsom-Meek, 1992; Koca & Demirhan, 2004; Mercier et al., 2017). One age band has been

missed. That is, research on university students' ATPE, PA, and their PA preference has barely been covered; hence, conducting a study to examine university students' ATPE, PA, and their PA preference is necessary and important. Therefore, the purposes of this study were to examine (1) the current status of university students' ATPE, (2) the participants' PA preferences, and (3) the relationships among the 20 items in the ATPE questionnaire and the features of the participants' responses to the survey.

The following research questions guided this study: (a) What factors form university students' ATPE? (b) Do differences exist in ATPE scores between male university students and female university students? (c) Do differences exist in ATPE scores between the participants' majors? (d) Do differences exist in ATPE scores between the participants' regions (who come from the South or the North)? (e) What is the order of the participants' PA preference? The findings of this study provide firsthand information and a new set of data into university students' ATPE and sports and PA research literature. They can also help professionals to develop better PE courses, physical activities, and sport training programs for young people during their college or university education.

Method

Research Design and Data Analyze

The research design and methods of data analyses were (1) to look at the effects of three independent variables within 20 dependent variables, which are 2 (Gender: Male, Female) × 2 (Major: Social Science, Natural Science) × 2 (Region: South, North); therefore, the 2 × 2 × 2 factorial multivariate analysis of variance (MANOVA) was implemented. The descriptive statistics reflected the general status of these participants' ATPE. (2) The follow-up 2 × 2 × 2 factorial MANOVA determined whether differences existed in the participants' ATPE between genders, majors, and regions. (3) To reveal the relationships among the university students' ATPE, a Pearson correlation was employed. The statistical program used for the data analysis was the IBM Statistical Package for the Social Sciences (SPSS) Version 25.

Participants and Data Collection

The participants were selected from six universities (three from the South and three from the North) of the People's Republic of China (PRC). After participants were selected, the request for conducting this study was submitted to these select universities, and their Institutional Review Board granted permission to conduct this study. The university students signed an informed consent form prior to data collection. The questionnaires were delivered by their teachers during a scheduled PE lesson. The participants were given certain times to complete the questionnaire. After the questionnaires were collected, we checked the completion of each questionnaire (uncomplete questionnaires were eliminated). The completion rate was 77%; that is, 1,386 questionnaires were collected from the 1,800 delivered. (*Note:* 300 questionnaires were delivered to each university). Details of these participants were gender (Female, 643; Male, 743), major (Social Science, 646; Natural Science, 740), and region (South, 661; North, 725). Age range was 18 to 20 years old, and they were in their freshmen or sophomore year.

Reasons for Selecting the Six Universities

There were five primary reasons for selecting these six universities: (1) All six universities provided required and regular PE or PA classes for their freshmen and sophomore students; (2) these universities possess the best sport and activity facilities or conditions for PE or PA classes and for the "out-of-PE curriculum physical exercises"; (3) these universities implement the "Standards of Chinese University–Student Physical Exercises"; (4) the students were required to take part in "out-of-PE curriculum physical exercises" 60 min/day that develop their physical fitness, involving fundamental locomotor, manipulative motor, and non-manipulative motor skills; and (5) these universities required the students learn the necessary knowledge and skills to establish and maintain their physical fitness through regular participation in PA and to maintain their personal health.

Measures

The Adapted University Students' Attitudes Toward Physical Education and Sports/Physical Activities Preference Questionnaire

(ATPESPAPQ; Zeng, 2012) was employed for the measurement. The ATPESPAPQ contains 29 questions, wherein 20 questions examine university students' ATPE. Participants responded to each question on a 5-point Likert-type scale: 5 (*very strongly agree*), 4 (*strongly agree*), 3 (*agree*), 2 (*somewhat agree*), and 1 (*little agree*). The odd number questions (1, 3, 5, 7, 9, 11, 13, 15, 17, and 19) were designed as positive statements; hence, their score is the same as in the 5-point Likert-type scale. The even number questions (2, 4, 6, 8, 10, 12, 14, 16, 18, and 20), however, were designed as negative statements, so their score should be used the opposite way; that is, 1 (*very strongly agree*), 2 (*strongly agree*), 3 (*agree*), 4 (*somewhat agree*), and 5 (*little agree*). Furthermore, seven questions investigate participants' "Demographic and General Information" and two questions examine the participants' "Sports/Activities Preferences." Additionally, the English version of the ATPESPAPQ (Zeng, 2012) was translated into Chinese and was approved by Peng Sun, a professor working at universities in China.

Results

Table 1 presents the demographic and general information of the participants.

Table 1
General Information of the University Students

Item		Answers	*f*	%
1.	What is your gender?	Male	743	53.61
		Female	643	46.39
2.	What science do you major in?	Natural science	740	53.39
		Social science	646	46.61
3.	How would you rate your body build?	Large size	159	11.47
		Fit size	287	20.71
		Average size	802	57.86
		Smaller size	138	9.96

Table 1 (cont.)

Questions		Answer	*f*	%
4.	How would you rate your level of fitness?	Very good	259	18.69
		Good	398	28.72
		On average	534	38.53
		Not good	195	14.07
5.	How would you rate your ability in sports?	Excellent	109	7.86
		Good	61	4.405
		Average	233	16.81
		Not that good	731	52.74
		Not good	313	22.58
6.	The frequency of your participation in the sport/ physical activity is:	Once a day	1009	72.80
		Twice a day	187	13.49
		Once every other day	141	10.17
		Three times per week	49	3.54
		Others (write it down: _____)	0	0
7.	Each time you participate in sport/physical activity is about:	60–90 minutes	1152	83.12
		100–120 minutes	187	13.49
		Up to 150 minutes	7	0.5
		Others (write it down: less than 60 min)	47	3.39

Note. N =1,386; Females = 643; Males = 743; Social Science = 646; Natural Science = 740; South = 661; North = 725.

Table 2 presents the descriptive statistics of the ATPE scores for the participants.

Table 2

Descriptive Statistics of University Students' Attitudes Toward Physical Education

Item		*M*	*SD*	Sum	Order
1.	I enjoy the feeling after I have a very well-organized physical education class.	4.205	.798	5828.000	4

Table 2 (cont.)

Questions	*M*	*SD*	Sum	Order
2. Based upon my experience, physical education is not a valuable subject.	2.942	1.351	4078.000	14
3. Physical education/activity provides a great relief from my daily life.	3.883	.943	5382.000	7
4. Physical education courses should be eliminated from college/ university curricula.	2.949	1.461	4088.000	13
5. It is important to me to keep physically fit and strong.	4.344	.834	6021.000	1
6. Physical exercises are only beneficial to the people who are already in good body shape.	2.937	1.421	4071.000	15
7. Physical exercise is the best way to obtain a youthful looking and agile body.	4.053	.869	5617.000	6
8. I believe physical education/activity is necessary, but I don'tmuch care about it.	2.936	1.165	4070.000	16
9. The formation of a positive (regular participation in physical activity) lifestyle is a person achieves his/ her optimal physical and mental functions necessary later in life.	4.226	.774	5857.000	3
10. Most college students get all the physical exercise they need just doing their daily work.	2.927	1.132	4057.000	17
11. For me physical education/activity classes are just as important as other academic classes.	3.781	.976	5240.000	8
12. During college, there are more important things than becoming a physically educated person.	2.983	1.078	4134.000	12
13. Having physical education classes and daily physical activity during college is the key to having good posture and sturdy body throughout one's life.	4.270	.720	5918.000	2

Table 2 (cont.)

Questions	*M*	*SD*	Sum	Order
14. Being serious about physical education/physical activity during college is brainless.	2.763	1.359	3829.000	19
15. Having daily physical exercise is one of the most important things in my collegiate life.	3.680	.979	5099.000	9
16. Keeping in good body shape takes more efforts than its worth.	3.167	1.165	4390.000	10
17. No other discipline is as useful as physical education for one's well-being.	3.090	1.077	4282.000	11
18. In my college/university, physical education programs have little to offer.	2.792	1.231	3869.000	18
19. The values of physical education and activity have scientific bases.	4.159	.719	5758.000	5
20. During one's college years, physical education has nothing to do with one becoming a successful person in one's later life.	2.752	1.161	3815.000	20

Note. N = 1,386, Females = 643, Males = 743, Social Science = 646, Natural Science = 740, South = 661, North = 725. Items 1, 3, 5, 7, 9, 11, 13, 15, 17, and 19 are positive statements, whereas Items 2, 4, 6, 8, 10, 12, 14, 16, 18, and 20 are negative statements.

Table 2 shows the top five scores based on participants' answers for Items 5, 13, 9, 1, and 19. The highest score ($M = 4.344 \pm .834$) was for Item 5, "It is important to me to keep physically fit and strong." In other words, the participants believed that physical education is the best way for them to keep fit and get stronger. The second highest score was for Item 13 ($M = 4.270 \pm .720$), "Having PE classes and daily physical activity during college years is the key to having good posture and sturdy body throughout one's life." The third highest score was for Item 9 ($M = 4.226 \pm .774$), "The formation of a positive lifestyle is a person achieves his/her optimal physical and mental functions necessary later in life." The fourth highest

score was for Item 1 (M = 4.205 ± .798), "I enjoy the feeling after I have a very well-organized PE class." This means that university students have an expectation of PE classes in higher education being well organized and conducted. The fifth highest score was for Item 19 (M = 4.159 ± .719), "The values of physical education and activity have scientific bases." In other words, university students understand their physical exercises have supports from the theoretical framework and scientific research; they expect their university's PE program to meet all the elements of scientific bases. Moreover, the sum of the total score for the 20 items was 70.16 or M_{grand} = 3.76, indicating the participants in this study possessed positive ATPE.

Table 3 presents the 2 × 2 × 2 MANOVA tests for determining whether significant differences existed among the three independent variables of the participants in relation to their ATPE mean score.

Table 3

Results of 2 (Gender: Male, Female) × 2 (Majors: Natural Science, Social Science) × 2 (Regions: South, North) Factorial MANOVA for the Participants' Attitudes Toward Physical Education (N = 1,386)

Source	Wilks' Λ	*F*	Hypo *df*	Error *df*	*p*
Gender	.857	11.324[a]	20.000	1360.000	.000
Major	.826	14.346[a]	20.000	1360.000	.000
Region	.227	231.096[a]	20.000	1360.000	.000

[a] Exact statistic.

The 2 × 2 × 2 factorial MANOVA (Table 3) showed significant differences in gender (male, female), $p < .000$, $\Lambda = .857$, $F = 11.324$; in major (natural science, social science), $p < .000$, $\Lambda = .826$, $F = 14.346$; and in region (South, North), $p < .000$, $\Lambda = .227$, $F = 231.096$. According to the research design, after significant effects were found, a follow-up test would be operated, hence the comparison for determining what and where the differences exist in their ATPE related to their gender (male, female), major (natural science, social science), and region (South, North). Table 4 presents the results of the follow-up 2 × 2 × 2 factorial MANOVA.

Table 4

Follow-Up 2 × 2 × 2 Factorial MANOVA for Determining Whether Differences Exist Between the Participants' ATPE on Their Gender, Major, and Region

	Gender		Major		Region	
Question no.	Female (n = 643) $M \pm SD$	Male (n = 743) $M \pm SD$	Social science (n = 646) $M \pm SD$	Natural science (n = 740) $M \pm SD$	South (n = 661) $M \pm SD$	North (n = 725) $M \pm SD$
1	4.163 ±.841	4.253 ±.742	4.150 ±.807	4.270 ±.782*	4.125 ±.805	4.228 ±.784*
2	2.916 ±1.324	2.972 ±1.383	2.792 ±1.271	3.114 ±1.420*	3.919 ±.979*	2.051 ±.977
3	3.795 ±.945	3.984 ±.932*	3.798 ±.952	3.980 ±.924*	3.856 ±.940	3.908 ±.946*
4	2.941 ±1.409	2.959 ±.841	2.840 ±1.393	3.074 ±1.127	4.069 ±1.009*	1.928 ±.983
5	4.235 ±.890	4.469 ±.747*	4.251 ±.901	4.451 ±.738*	4.205 ±.966	4.470 ±.669*
6	2.912 ±1.417	2.966 ±1.425	2.777 ±1.379	3.121 ±1.447*	4.038 ±.927*	1.934 ±.982
7	3.952 ±.932	4.168 ±.775*	3.977 ±.910	4.139 ±.812*	3.948 ±.924	4.147 ±.805
8	3.040 ±1.161*	2.816 ±1.158	2.970 ±1.191	2.809 ±1.168	2.882 ±1.108	2.986 ±1.213
9	4.196 ±.779	4.259 ±.766	4.278 ±.841	4.243 ±.774	4.112 ±.842	4.330 ± .691
10	2.963 ±1.105	2.884 ±1.163	2.890 ±1.080	2.969 ±1.190	3.513 ±1.007*	2.393 ± .965
11	3.624 ±1.032	3.961 ± .875*	3.673 ±1.018	3.904 ±.911*	3.715 ±.926	3.840 ± .926
12	3.024 ±1.096	2.934 ±1.055	3.011 ±1.087	2.950 ±1.067	2.868 ±1.031	3.087 ±1.109
13	4.208 ± .749	4.341 ± .679*	4.240 ±.727	4.303 ±.711*	4.247 ±.761	4.291 ± .681
14	2.704 ±1.389	2.831 ±1.322*	2.587 ±1.332	2.963 ±1.364*	3.734 ±1.100*	1.877 ± .887

Table 4 (cont.)

Question no.	Gender		Major		Region	
	Female (n = 643) $M \pm SD$	Male (n = 743) $M \pm SD$	Social science (n = 646) $M \pm SD$	Natural science (n = 740) $M \pm SD$	South (n = 661) $M \pm SD$	North (n = 725) $M \pm SD$
15	3.547 ±1.027	3.830 ± .899*	3.581 ±1.006	3.791 ± .935	3.602 ± .988	3.749 ± .966
16	3.339 ±1.131*	2.968 ±1.173	3.402 ±1.121*	2.897 ±1.156	2.679 ±1.116	3.612±1.023*
17	3.075 ±1.067	3.107 ±1.089	3.142 ±1.053	3.031 ±1.102	3.098 ±1.106	3.082±1.050
18	2.823 ±1.257	2.754 ±1.199	2.774 ±1.230	2.811 ±1.231	2.042 ±.938	3.474±1.057*
19	4.097 ± .815	4.221 ± .583*	4.112 ± .800	4.203 ± .610	4.016 ±.802	4.280 ± .608
20	2.751 ±1.173	2.754 ±1.148	2.687 ±1.145	2.826 ±1.176	3.452 ± .970*	2.114 ± .931

Note. In gender' comparisons, 10 out of 20 reached significant difference level. In major comparisons, 10 out of 20 reached significant difference level with the Natural Science score higher than the Social Science score in nine comparisons, but one comparison (Q16) showed Social Science scored higher than Natural Science. In region comparisons, six out of 20 reached significant difference level with the South scoring higher than the North, and five of them reached significant difference level with the North scoring higher than the South as well.

*Significant difference at .05.

Data in Table 4 show that in gender comparison, 10 items reached a significant difference ($p = .05$), in which males scored higher than females on Items 3, 5, 7, 11, 13, 14, 15, and 19. Females scored higher than the males in Items 8, "I believe physical education/activity is necessary, but I don't much care about it," and 16, "Staying in good body shape takes more effort than it is worth." In major comparisons, 10 items reached a significant difference ($p = .05$), in which natural science scored higher than social science on Items 1, 2, 3, 5, 13, 6, 7, 11, 13, and 14; however, social science scored higher than natural science on Item 16. Moreover, in region comparisons, 11 items reached a significant difference ($p = .05$), in which the South scored higher than the North on Items 2, 4, 6, 10, 14, and 20. The North scored higher than the South on 1, 3, 5, 16, and 18 (Tables 2 and 4).

Table 5 presents the results of the investigation on the participants' sport and PA preference.

Table 5
Summary of the University Students' Sport and Physical Activity Preferences

Question		Sport/activity		*n*	%
1.	What types of sports do you like the most?	a.	Team sports (e.g., soccer, basketball, volleyball, baseball, hokey)	908	65.51
		b.	Individual sports (e.g., Track & field, gymnastics, swimming, martial arts)	315	22.73
		c.	Dual-game sports (e.g., tennis, badminton, table tennis)	163	11.76
2.	What types of activities do you like the most?	a.	Aerobic exercise	348	25.11
		b.	Weight lifting	439	31.67
		c.	Dance	211	15.22
		d.	Outdoor adventure	139	10.03
		e.	Martial arts	249	17.97
		f.	Other activities (please write it down here _____)	0	0.00
Total				1,386	100

Note. $N = 1{,}386$; Males = 743; Females = 643.

Clearly, these university students prefer team sports. But for the physical activity preference, they tended to choose weight lifting, aerobic exercise, and martial arts. Although the participants had the opportunity to choose the other activities, no one took this option.

Table 6 shows the relationships among these university students' ATPE. Figure 1 summarizes and illustrates the features of ATPE of these university students.

Discussion

This study examined the status of university students' ATPE and their PA preference. Meanwhile, it also investigated whether there were differences in these university students' ATPE with respect to gender, major, and region. Generally speaking, the total sum score across the 20 items for ATPE of the participants is 70.16 or $M_{grand} = 3.76$, indicating the participants' ATPE is at a positive position, but there is definitely room for improvement (with 5.00 as full score).

Specifically, the five highest scores by the participants are for Items 5, 13, 9, 1, and 19 (Table 2). The score rank is from $M = 4.344$ to $M = 4.159$. The key factors or statements of these five items are "It is important to me to keep physically fit and strong," "Having PE classes and daily physical activity during college years is the key to having good posture and sturdy body throughout one's life," "The formation of a positive lifestyle is a person achieves his/her optimal physical and mental functions necessary later in life," "I enjoy the feeling after I have a very well-organized physical education class," and "The values of physical education and activity have scientific bases." It is not hard to identify these factors related to "value and benefits," "need and care," "perception and recognition," "expectation and feeling," and "belief and value" about PE and PA. We believe that these are the critical factors that structure the ATPE of these university students.

Concerning sport and PA preferences of the participants, with a wide range of selection from their PE curriculum in these four universities, the rankings are in team sports, soccer, basketball, volleyball, baseball, hokey, and baseball; in individual sports, track and field, gymnastics, swimming, and martial arts; and in dual-game sports, tennis, badminton, and table tennis. As a result, team sports become the participants' first choice, individual sports the second,

Table 6

Relationships Among University Students' Attitudes Toward Physical Education, Physical Activity, and Physical Education and Activity

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
(1) Feeling after a good PE lesson	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
(2) PE is not a valuable subject	-.37**	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
(3) PEA can provide great relief	.34**	-.07**	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
(4) Should eliminate PE courses	-.32**	.76	-.13**	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
(5) Need to keep fit and strong	.43**	-.33**	.35**	-.27**	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
(6) PA is not good for everyone	-.32**	.81**	-.01	.78**	-.29**	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
(7) PA, young looking, agile body	.56**	-.37**	.33**	-.33**	.52	-.35**	1	–	–	–	–	–	–	–	–	–	–	–	–	–
(8) Not much care about PEA	-.47**	.30**	-.33**	.27**	-.35**	.27**	-.47**	1	–	–	–	–	–	–	–	–	–	–	–	–
(9) Lifestyle and factors later in life	.58**	-.39**	.35**	-.29**	.53**	-.37**	.62**	-.48**	1	–	–	–	–	–	–	–	–	–	–	–
(10) PA and their daily works	-.43**	.70**	-.11**	.63**	-.34**	.70	-.45**	.41**	-.51**	1	–	–	–	–	–	–	–	–	–	–
(11) PEA is important as others	.52**	-.37**	.34**	.37**	.44**	-.34**	.63**	-.58**	.53**	-.43**	1	–	–	–	–	–	–	–	–	–
(12) Physically educated person is not that important	-.39**	.23**	-.18**	.14**	-.31**	.21**	-.42**	.47**	-.46	.39**	-.43**	1	–	–	–	–	–	–	–	–

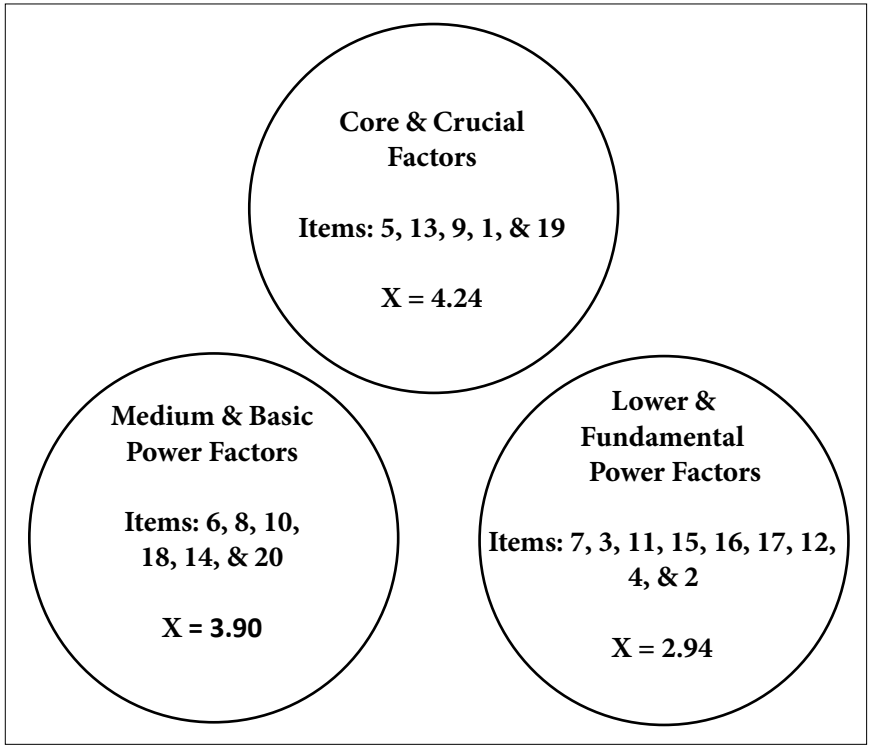
Table 6 (cont.)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
(13) Good posture and sturdy body are the results of PEA	.50**	-.35**	.35**	-.21**	.47**	-.29**	.57**	-.50**	.63	-.48**	.51**	-.45**	1	–	–	–	–	–	–	–
(14) No need to pay much attention to PEA during college	-.25**	.67**	-.04	.72**	-.25**	.72**	-.27**	.14**	-.30**	.61**	-.24**	.11**	-.19**	1	–	–	–	–	–	–
(15) Having daily PA is one of the most important things in college life	.51**	-.32**	.33**	-.38**	.47**	-.28**	.56**	-.56**	.52**	-.39**	.66**	-.41**	.43**	-.27**	1	–	–	–	–	–
(16) Keeping good body shape takes more efforts than its worth	.50**	-.23**	.12**	-.25**	-.08**	-.25**	-.01	.01	.06*	-.14**	-.03	.14**	.05*	-.16**	-.04	1	–	–	–	–
(17) PE is most useful for one's well-being	.36**	-.21**	.18**	-.12**	.21**	-.16**	.38**	-.39**	.36**	-.27**	.35**	-.31**	.35**	-.04	.32**	.17**	1	–	–	–
(18) My college PE programs offer to little	-.21**	-.20**	-.11**	-.34**	-.12**	-.25**	-.26**	.34**	-.25**	-.01	-.27**	.39**	-.33**	-.31**	-.20**	.23**	-.27**	1	–	–
(19) PEA has scientific bases	.47**	-.38**	.34**	-.25**	.60**	-.32**	.51**	-.31**	.58**	-.42**	.45**	-.26**	.56**	-.27**	.40**	.06*	.30**	-.15**	1	–
(20) PE and a successful person	-.43**	.73**	-.13**	.65**	-.36**	.73**	-.43**	.39**	-.52**	.72**	-.43**	.35**	-.46**	.62**	-.42**	-.22**	-.28**	-.03	-.47**	1

Note. N = 1,386, Female = 643, Male = 743. PE = physical education, PA = physical activity, PEA = physical education and activity.
*p = .05. **p = .01.

Figure 1

Attitudes Toward Physical Education Features and Illustration of the University Students



Note. The circles represent three levels of attitudes toward physical education and physical activity of the participants. Each item has its special meaning. Level 1: Items 5 (value and benefits), 13 (need and care), 9 (perception), 1 (expectation and feeling), and 19 (belief and value). Level 2: Items 6 (recognition), 8 (position), 10 (physical activity is enough), 18 (physical education should do more), 14 (physical education is not that important), 20 (no connection between physical education and future). Level 3: Items 7 (benefits), 3 (experience), 11 (need), 15 (things must to do), 16 (effort), 17 (appreciation), 12 (not in priority), 4 (no need), and 2 (not a valuable course).

and dual-game sports the third (Table 2). These findings might be attributed to the influence of (a) the status of facilities and equipment of these universities; (b) these universities having a tradition of being good at playing team sports and having team sports in their physical education curricula; (c) the faculties (PE instructors, university varsity teams' coaches) of the universities all possessing attractive sports skills in all types of sports provided to the students; and (d) the universities' policy allowing their students to decide what types of sport to take part in (called "Select course").

Among the five physical activities listed on the ATPESPAPQ (Zeng, 2012), the order of the participants' choice is weight lifting, aerobic exercise, martial arts, dance, and outdoor adventure. The program directors suggested that these activity preference orders might have been influenced by (a) their universities implementing the "Standards of Chinese Collegiate Physical Exercises," (b) the traditional activities of these universities, (c) the influence of PE teachers and the collegiate sports coaches, (d) the attractiveness of the PE and PA curricula, and (e) the environmental factors (facilities and equipment) of PE classes and PA exercise places and gyms.

With regard to the gender differences between males and females, the results show significant differences in the ATPE scores in Items 3, 5, 7, 11, 13, 14, 15, and 19 with the males scoring higher than the females. The females scored higher than the males in Items 8, "I believe physical education/activity is necessary, but I don't much care about it," and 16, "Staying in good body shape takes more effort than it is worth." This finding is consistent with those in other studies (e.g., Birtwistle & Brodie, 1991; Koca & Demirhan, 2004; Parkhurst, 2000; Subramaniam & Silverman, 2007). These studies reported that in general, male students held more positive ATPE than female students. The findings of this study, however, are consistent with the findings of other studies (e.g., Chung & Phillips, 2002; Colley et al., 1994; Greenwood & Stillwell, 2001; Hicks et al., 2001; Koca & Demirhan, 2004). These studies indicated that for physical activities focused on aesthetics with beautiful and graceful movements (e.g., dance, gymnastics, and yoga), female students showed more positive ATPE than male students.

On the other hand, the studies of the students' attitudes toward PA found males had more positive attitudes toward PA with elements of challenge and risk (e.g., Chung & Phillips, 2002; Smoll & Schutz, 1980; Subramaniam & Silverman, 2007). Regarding this concern, this study shows that male university students are more in favor of physical activities such as weight lifting, outdoor adventure, and martial arts than are female university students. In general, both male and female university students showed positive and similar attitudes toward PE and PA. This finding is consistent with those in many other studies (e.g., Prochaska et al., 2003; Subramaniam & Silverman, 2007; Tannehill et al., 1994; Telama et al., 2005; Zeng, 2012). In particular, however, the male university students in this study showed much better attitudes toward their PE classes than did the female university students and more regard for the item "Physical education/activity provides great relief from my daily life." Although our study was conducted at the collegiate level, the finding is consistent with the finding from Tappe et al. (1990). Tappe et al. discovered that male students' and female students' motivations to participate in physical activities quite differ. Both had health-related motivations, but their primary motivations were totally different. Male students wanted to improve power or strength and to develop more fitness that related to general benefits, whereas female students wanted to improve flexibility and reduce their weight.

It is worth pointing out that females scored significantly higher in Items 8 and 16, and they accepted the statements of "I believe physical education and PA is necessary, but I don't much care about it" and "Keeping in good body shape takes more efforts than its worth"—an unanticipated result. This means that a high percentage female participants hold this point of view. Physical educators in these universities need to pay attention and find solutions to improve female students' attitudes toward their PE and daily PA. Because "attitude is a little thing that makes a big difference," according to Winston Churchill, attitude can impact a person's response to partners, facilities, situations, places, and others. If those negative thoughts or attitudes are allowed to develop, the students will not obtain the necessary education or corrections about the attitudes toward PE and PA, and their thoughs or attitudes will extend over

their whole college education, and even extend into their life after university.

Concerning major, significant differences in the ATPE scores were found for Items 1, 2, 3, 5, 6, 7, 11, 13, and 14 with natural science students scoring significantly higher than social science students. These findings demonstrate that students from natural science hold remarkably more positive attitudes toward PE and PA than students from social science. Although no one will really know the reasons behind these findings, it may be that students from natural science had a better understanding of the importance of PE and participate in daily physical exercise in their lives (Tables 2 and 4). As to why the students from social science scored significantly higher than students from natural science in Item 16, "Keeping in good body shape takes more efforts than its worth," it might be that students from social science feel they have so much to do during their college years that "keeping in good body shape" was not on their "list of things to do." They may have scored higher because they agree with the statement or thought it reflected what they believe about the value of "keeping in good body shape." Again, these students need to get positive and corrective guidelines or advice from the physical educators of the universities.

Regarding the impact of region on participants' ATPE, six out of 20 comparisons (Items 2, 4, 6, 10, 14, and 20) reached a significant difference level ($p < .05$) with South students scoring higher than North students. In contrast, five out of 20 comparisons reached a significant difference level ($p < .05$; Items 1, 3, 5, 16, and 18) with North students scoring higher than South students. What would be the main reasons behind these findings? Besides both the universities from the South and North implementing the same national policy in PE and PA—the Chinese college students' physical exercise standards—all universities have the same mandated school hours in PE. The following might be the reasons or explanations: (1) alignment with the "Chinese reform and opening-up" (since 1979). The South region appears to perform better than the North region in economic, education, and scientific development ("Chinese Reform and Opening-Up," 2017). (2) Among the selected universities, the universities located in the South were ranked slightly higher than the universities in the North, meaning that universities located in

the South had better facilities and equipment for PE and PA. (3) The weather and natural environment conditions in the South are more suitable for students to implement their daily PA plan than in the North.

In summary, the findings and discussion provide theoretical and reality bases for universities on reforming their PE curriculum and PA programs and finding more effective ways to improve their teaching, coaching, and management. Because there are so many similarities in all higher education institutions, it would be useful for professionals to make a profound diagnosis of their students' attitudes toward PE and PA at their university/college. For their ongoing PE curriculum, PA programs, teaching, coaching, and management reform and reinforcement, the findings and discussion of this study will be a helpful resource or reference.

In conclusion, (1) the participants' attitudes toward PE and PA status are in a positive position, but there is room for improvement. (2) The crucial factors structuring the participants' attitudes toward PE and PA are Items 5, 13, 9, 1, and 19; these five factors relate to "value and benefits," "need and care," "perception and recognition," "expectation and feeling," and "belief and value" about PE and PA. (3) For the three independent variables (gender, major, and region), the male students possess better attitudes toward PE and PA than do the female students; the students from natural science possess better attitudes toward PE and PA than do students from social science; and region impacts the participants' attitudes toward PE and PA and their PA preference, but these types of influence depend on each region and the university's situations.

Recommendations

We would like to make the following recommendations for phyiscal educators at higher education institutions: (1) Increase the "role model" impact during teaching PE classes and coaching physical activities (e.g., provide well-prepared and organized lessons, perform skill demonstrations in various ways, and engage in the PA that is being promoted to the students). (2) Increase the number of students engaged in multiple motor skills in class time and in after-class PA. (3) Use different teaching methods to meet the needs of diverse learners (e.g., male, female, very active or not active, good

at sport or not good at sport). (4) Offer a wide variety of sports and physical activities courses for university students to choose from. (5) Consider students' preference, gender, and major characteristics when making yearly PE and PA planning and programs. (6) Invite national or international or local sports stars with a good reputation to visit campus and give a speech to the students.

Attitude might be regarded as a little thing, but it can make a big difference in students' attitudes toward PE; changing or rebuilding a person's attitude may take time, but with physical educators from all levels paying attention and working together, in the long run university students will gain a healthier and more positive attitude toward PE and PA.

Limitations

This study had several limitations: (1) The size of the sampling is relatively small for this topic. (2) The data collection scope was on purpose and covered six universities only. (3) Teachers and directors of PE and PA programs in the selected universities might have certain impacts on their students' ATPE and sports and physical activity, but they were not included in the scope of the study. Future studies can overcome these limitations, for example, by including PE teachers and program directors, creating specific open-ended questions for them to answer, involving more universities, and using a larger number of participants.

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