

# Expectancy Beliefs and Perceived Values of Chinese College Students in Physical Education and Physical Activity

Ang Chen and Xinlan Liu

**Background:** The expectancy-value theory postulates that motivation relies on individuals' beliefs of success, perceived Attainment, Intrinsic Interest, and Utility values and Cost. This study examined Chinese college students' expectancy-value motivation in relation to physical education and self-initiated physical activity. **Methods:** A random sample of 368 Chinese university students responded to questionnaires on perceived expectancy beliefs, perceived values, and cost in terms of their experiences in mandatory physical education programs and in self-initiated after-school physical activity. They reported their choice decisions for continuing physical education. Data were analyzed using descriptive statistics,  $\chi^2$ , logistic and linear regressions. **Results:** The physical education curriculum was perceived as a major cost to motivation. Motivated by the Intrinsic Interest and Utility value, most students chose to continue to take physical education. Self-initiated after-school physical activity was motivated by the Attainment value only. No association was found between self-initiated physical activity and Liking or Disliking of physical education. **Conclusion:** Motivation for physical education and for self-initiated physical activity derived from different perceived values. The Attainment value motivates the students for self-initiated physical activity, whereas Intrinsic Interest and Utility values motivate them to choose to continue physical education.

**Keywords:** task values, choice decisions, motivation specificity

The child and adolescent obesity epidemic has spread in China in recent years. Statistics have shown a rapid increase in the number of obese children and adolescents from 1% and 2% for boys and girls in 1985, respectively, to about 7% and 5% in 1995 and to about 25% and 17% in 2000.<sup>1</sup> Similar to the situation in the United States, helping children and adolescents develop strong motivation for physical activity has become a central goal in physical education.

In the United States, developing physically active living has become a major goal for physical education.<sup>2</sup> A physically educated student is expected to motivate him/herself to engage in health-enhancing physical activities by voluntary choice

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and persistent effort. Schools, from elementary to college, are responsible for providing effective physical education programs to help students develop and sustain the ability to make sound choices, put forth enough effort, and strive to achieve the goal of physically active living.<sup>3</sup> We believe that this curricular change is currently taking place in China's education systems as well.

The purpose of this study, therefore, was to use the expectancy-value theory<sup>4</sup> as a lens to examine Chinese college students' motivation in their mandatory physical education and in their self-initiated physical activity outside of physical education. We believed that the study not only would help understand motivation issues in Chinese college physical education, but would also provide useful information to inform our US colleagues as some are proposing to resume required physical education for all college students.<sup>3,5,6</sup>

## Expectancy-Value Theory

The constructs of expectancy beliefs and perceived values<sup>7</sup> underline almost all cognitive theories of motivation, including attribution theory,<sup>8</sup> self-efficacy theory,<sup>9</sup> and, lately, the achievement goal theory.<sup>10,11</sup> Motivation, especially in the school environment, has been shown to rely on competence-based expectations for success and perceived values of tasks. However, as Wigfield and Eccles pointed out, these theories often overemphasize the role of expectancy as related to perceived competence and overlook the motivational function of task values.<sup>7</sup>

The contemporary expectancy-value theory of motivation derives from Atkinson's classic theory about functions of individual expectancy of outcome and perceived values in behaviors.<sup>12</sup> It is suggested that motivation associated with a specific activity should be understood in relation to perceived values of the activity.<sup>13</sup> Using exploratory and confirmatory factor analyses on large data sets from learners of mathematics, Eccles and Wigfield have identified 3 commonly perceived task values in mathematics: Attainment Value (importance), Intrinsic Interest Value (interest), and Utility Value (usefulness).<sup>4</sup> Another factor in the perceived value dimension is Cost, which is defined as anything perceived and/or experienced in an activity that hinders one's effort to pursue success.<sup>7</sup> These value dimensions have been found to be independent from expectancy beliefs for success.

The *Expectancy Belief* is defined as a person's beliefs about how successful he or she will be in upcoming activities. The *Attainment Value* depicts the perception of the importance of an activity. The *Intrinsic Interest Value* is about how interesting and enjoyable the person perceives the activity to be. The *Utility Value* concerns perceived usefulness of the activity to the person's current or future life. The *Cost* refers to negative aspects of the activity, such as fear of failure or lost opportunities, that the person might endure from choosing the activity over others.<sup>14</sup>

Recent studies on expectancy beliefs and task values have concluded that students in schools are developing a self-concept system with many beliefs and perceptions. These beliefs and perceptions eventually are integrated to inform activity-specific expectancies for success in a variety of content areas (eg, mathematics, physical activity) that motivate, or demotivate, the students in making participation decisions.<sup>7,13,14</sup> Although some of the beliefs and perceptions can be global, such as

achievement goal orientations, others are specific to content domains or learning tasks, such as self-efficacy and expectancy values.

Expectancy beliefs and perceived values are domain specific. For example, in mathematics and sports, children and adolescents can demonstrate drastically different expectancy for success and different appreciation for task values.<sup>4</sup> In physical education, it has been documented that the expectancy beliefs and perceived values are positively associated with task-choice decisions, performance, effort, and persistence.<sup>15</sup> Students with an expectancy belief of being able to succeed in an activity are more likely to demonstrate willingness to engage in challenging tasks, to perform better in physical activity tests (eg, 1-mile run), and to put forth effort in physical activities than those without a belief of succeeding in the activity. It has been reported repeatedly<sup>16,17</sup> that for students, the Intrinsic Interest Value is the sole predictor of motivation for future participation in running, a dull but beneficial activity for health. Compared with running laps, students prefer to run in games where they are experiencing higher level of enjoyment.<sup>16</sup> These findings have confirmed that once students become able to distinguish what they can be successful at and what they value, they are more likely to make sound motivation decisions.<sup>4</sup>

Developmentally, the expectancy-value based motivation declines when students grow older.<sup>13</sup> In a 12-year longitudinal study on changes of expectancy beliefs and perceived values in children, Jacobs, Lanza, Osgood, Eccles, and Wigfield reported that children's expectancy beliefs for success declined steadily in mathematics and sports. The decline in language arts stopped at the 7th grade, and the beliefs rebounded upward afterward.<sup>13</sup> Their perceived values, on the other hand, declined steadily in mathematics, language arts, and sports. But the perceived values did rebound in language arts after the 7th grade. For sports, the perceived values rebounded at the 10th grade only in those students, especially girls, who had strong expectancy beliefs for success.<sup>13</sup> It was also reported<sup>13</sup> that the differentiation of different values (Attainment, Intrinsic Interest, and Utility) becomes more distinct with growth and the Attainment and Utility values take more shares of variance, which explains adolescents' motivation in these activity areas. Although data on college students are lacking, it is reasonable to assume the value differentiation will continue, and motivation for physical education and self-initiated physical activity are likely to become dependent on expectancy beliefs and perceived values acknowledged by specific individuals.

Although physical inactivity and childhood obesity have been recognized as an increasing problem in modern China,<sup>1</sup> research on motivation for increasing physical activity participation in Chinese schools and universities has been scarce in the literature. Institutionally, the education system in China is characterized by centralized national curricula at all levels of education and in all subject-matter areas. There is no exception for physical education. College students are required to take mandatory physical education. In China, most college students are required to live in dormitories on campus. They have opportunities to use school physical activity facilities for after-school physical activity. However, it is not clear how students' expectancy beliefs and perceived values in physical activity are associated with mandatory physical education and to what extent the beliefs and values are associated with students' motivation for self-initiated physical activity during after-school hours.

In this study, we intended to investigate the motivation function of the expectancy beliefs and task values in Chinese college students as related to physical

education. The purpose of this study was to identify and describe the role of the expectancy beliefs and perceived values as associated with Chinese college students' motivation for mandatory physical education and self-initiated after-school physical activity. It was hypothesized that (a) students would be able to identify different types of costs to motivation, as well as positive expectancy beliefs and values in physical education; (b) perceived values would be the major motivators for choice decisions and self-initiated physical activity; and (c) motivation for mandatory physical education and self-initiated physical activity would rely on differentiated expectancy beliefs and value dimensions (Attainment Value, Intrinsic Interest Value, Utility Value, and Cost).

## Method

### Research Setting

The study was conducted in 4 universities in a major metropolitan area in south-eastern China. One university was ranked as a National Key university, 2 were Provincial Key universities, and the fourth was a Regular university. The rankings are determined by the official government tracking system by which Chinese universities enjoy their academic reputations and the size of government funding (National Key is the most privileged and Regular is the least). Physical education was a required 4-year program and was offered year-round. At the time of the study, the physical education programs in the universities were offering Tai-Chi, table tennis, badminton, soccer, basketball, volleyball, tennis, aerobics, orienteering, and theories associated with these activities. On each campus, there were a gymnasium, a weight room, an outdoor track field, about 6 to 8 outdoor basketball courts, 3 or 4 volleyball courts, 4 tennis courts, and a table tennis house.

All together in these universities, there were 403 cohort classes of about 30 students each in physical education. The students participated in physical education in both spring and fall semesters each year. Each semester is about 16 weeks long. The students were constantly under pressure to demonstrate excellence consistent with the "Three-Excellence" philosophical doctrine of education: Excellence in Health, in Academic Achievement, and in Daily Work. They were required to attend at least one 100-minute physical education lesson each week. Most had 2 lessons each week. There were 74 physical education teachers all together in these universities. All had at least a bachelor's degree in physical education instruction. Instructions were very structured in that the teachers followed lesson plans pre-determined by the Bureau of Higher Education. Direct teaching styles were the primary instruction method in which students were expected to follow teachers' directions during the entire lesson.

### Participants

For this study, a random sample of 368 students was selected from the 4 universities. A random drawing system was applied using the standard random table to select the classes first for the purpose of sampling efficiency. After a random sample of classes was identified, a sample of students was randomly selected from all who volunteered for the study. The random sampling rendered more female students ( $n = 245, 67\%$ ) than males ( $n = 123, 33\%$ ). Because observed gender differences in

expectancy beliefs and values are often overridden by their perception of competence,<sup>13</sup> resampling was deemed unnecessary. The mean age of the participants was 20.4 (SD = 1.34, range = 17–24). All the students were enrolled in the “required mandatory” phase of physical education as freshmen, sophomores, and juniors (seniors were required to take physical education but had the option to choose activities). All participants agreed to participate by signing the consent form and were notified of their right to withdraw from the study.

## Variables and Measures

We used a mixed design to collect quantitative data on expectancy beliefs and perceived values and qualitative data on cost and choice decisions. Expectancy and task values were measured using a 13-item (on a 5-point Likert-type scale) Self- and Task-Perception Questionnaire<sup>18</sup> originally developed for high school students. Following the example in Jacob et al,<sup>13</sup> we replaced “mathematics” with “physical education classes” or “physical activity” wherever appropriate and added “this semester” to define the time frame.

For the expectancy beliefs dimension, we used the reworded 6 original items. These items demonstrated high-quality psychometric properties in a series of studies.<sup>5</sup> We used the reworded 6 original items to measure the perceived task value dimensions. Consistent with the structure of the original instrument, 2 items were used to measure each task value dimension (ie, Attainment, Intrinsic Interest, and Utility). Eccles and Wigfield demonstrated that the items can provide data with high validity and reliability,<sup>5,13,14</sup> and Xiang et al provided high validity and reliability evidence in physical education.<sup>15,17</sup>

In the original instrument for mathematics, the Cost dimension was operationalized as perceived task difficulty and effort for achieving good grades in mathematics and was measured with 9 items associated with studying mathematics. In the current study, we took the broad conceptualization of Cost<sup>7</sup> and operationalized Cost as possible causes to the loss of motivation in physical education. It was measured using an open-ended question: “If there is anything that would make you dislike physical education, what is it? Why?” Choice Decision motivation was measured using another open-ended question: “If you could have a choice whether to take physical education, would you rather not to take it or you still want to take it? Why?”

*Self-initiated physical activity* was conceptualized as those that students initiated to do outside of physical education. All students in these universities were required to live in campus dormitories, and thus had access to physical activity facilities on campus. Self-initiated physical activity was measured using Bouchard Three-Day Physical Activity Survey.<sup>19</sup> The self-report survey requires respondents to log in their physical activities by a quarter hour every day for 2 work days and 1 weekend day. The self-reported time for physical activity during after-school hours was used as the measure of motivation for self-initiated physical activity. The questionnaire was validated with adolescents and demonstrated a high test–retest reliability ( $r = .91$ ).

Both instruments were translated into Chinese and were validated by bilingual Chinese-American scholars ( $n = 6$ ). An Adelphi procedure was used in which identical translated expressions were kept and discrepant ones were highlighted and sent back to the scholars for reconsidering translation accuracy. The process

was repeated until a 100% agreement on translated expressions was achieved. The construct validity of the Self- and Task-Perception Questionnaire<sup>18</sup> was examined with the data from the current study using a factor-analytical process with the 4 dimensions (the expectancy belief and 3 task values) predefined. The data showed acceptable construct validity with loadings on the dimensions ranging from .64 to .99. The internal consistence reliability coefficients (Cronbach  $\alpha$ ) were .83, .63, .86, and .81 for the expectancy belief, attainment, intrinsic interest, and utility value, respectively.

## Data Collection

Trained graduate assistants and the second author administered the 2 instruments on separate days in physical education classes. The students were informed that their participation would not affect their grades in physical education or other courses. They were instructed to respond to the questionnaires independently and honestly and to rate each item based on their own feelings and experiences in college. Informed consent forms were distributed to and collected from the students on the first day of data collection. Students in the sample who were not willing to participate were replaced by those in the back-up sample pool of participants.

Written responses to the open-ended questions about Cost and Choice Decisions were followed with short interviews probing on the “why” questions by the data collectors. These follow-up questions were different given that the students gave different answers to the stem questions. They included but were not limited to “Why is Tai-Chi inappropriate for college students?” and “Why does teacher emphasizing on discipline and practice formations decrease your motivation?” The interviews were conducted in subsequent classes in which the students were asked individually to stop their activity to answer the questions. Interviews were recorded in writing for analysis.

## Data Reduction and Analysis

Responses to the Self- and Task-Perception Questionnaire were aggregated and averaged by the dimensions of the expectancy-value construct.<sup>18</sup> Responses to the open-ended cost questions and interview questions were coded, categorized into thematic categories using the constant comparison technique involving the open, axial, and select coding and trustworthiness checking procedures until the identified categories were saturated. Two strong thematic variables related to the purposes of the study emerged in this analysis procedure: students’ liking or disliking of physical education (Liking/Disliking) and hypothetical decisions to continue physical education (Choice Decision) if they had the option not to take physical education in college. Follow-up analyses<sup>20</sup> were conducted to reveal reasons for liking/disliking and choosing/not choosing physical education.

Self-initiated physical activity times logged in the Bouchard Three-Day Physical Activity Survey were aggregated for each day. A student was considered physically active (Active) if he or she engaged in moderate-to-vigorous physical activities more than 30 minutes on each of the 3 days. Those who had less than 30 minutes of physical activity each day or were not active every day were categorized as physically inactive (Inactive). Frequencies in the Active and Inactive categories were used in the subsequent analyses.

The variables generated from the qualitative analysis, Liking/Disliking of Physical Education, Choice Decision, and Active/Inactive during after-school hours, were coded and were subject to statistical analyses to understand the function of the students' expectancy beliefs and task values. The intercoder agreement was established on about 15% of all codes, which reached 96% agreement between the researchers; the intracoder agreement reached 100% for both of the researchers. Preliminary descriptive analyses were used to depict the students' expectancy beliefs and perceived values, to summarize students' liking/disliking of physical education, choice decisions and their cited reasons, and to describe their current after-school physical activity. The contingency table approach (eg,  $\chi^2$  analysis) was used to explore the association between Liking/Disliking of physical education and Choice Decisions; and between Liking/Disliking of physical education and Active/Inactive during after-school hours. Logistic and multiple regressions were used to examine predictability of expectancy beliefs and task values for students' choice decisions and after-school physical activity.

## Results

### Expectancy Beliefs and Task Values

Table 1 reports the descriptive statistics of expectancy beliefs and task values and after-school physical activity. The students thought that physical education was important, interesting, and useful. Their beliefs about success in physical education, however, were not particularly strong (3.35 on a 5-point scale). On average, they spent a good amount of after-school time (46 minutes) participating self-initiated physical activities.

The constant comparison analysis of Cost revealed that 45% of the students ( $n = 157$ ) thought that the physical education curriculum did not meet their needs and, therefore, was the number one cost to their motivation. Other forms of Cost included insufficient facility and equipment ( $n = 93$ , 27%), the teacher's incompetence in teaching effectively ( $n = 49$ , 14%), the teacher's authoritarian personality and teaching style ( $n = 42$ , 12%), and frequent and meaningless physical fitness/skill tests ( $n = 23$ , 7%).

**Table 1 Descriptives for Expectancy-Value and Self-Initiated Physical Activity (N = 368)**

	Minimum	Maximum	Mean	SD	Skewness
Expectancy	1.60	5.00	3.35	.62	-.048
Attainment	1.00	5.00	4.26	.73	-1.173
Interest	1.00	5.00	3.82	.80	-.300
Utility	1.00	5.00	3.86	.81	-.467
Physical Activity <sup>a</sup>	0.00	149	46.39	23.23	.950

<sup>a</sup> In minutes.

## Physically Active Lifestyle and Physical Education

The data reported in Table 2 show that 204 (58%) of the students were categorized into the Active category. In addition, 287 (82%) students disliked physical education for the various reasons reported previously. The  $\chi^2$  analysis revealed no statistically significant association between Liking/Disliking of physical education and Active/Inactive lifestyle ( $\chi^2 = .003, P = .96$ ). It is clear that 58% of the students were physically active regardless of their feelings about physical education.

Most students ( $n = 326, 92\%$ ) decided that they would continue physical education. They made the decision based on beliefs that physical education was providing health benefits to them through physical activity ( $n = 228, 64\%$ ), that physical education was the only opportunity to learn knowledge and skills useful for healthful living ( $n = 116, 33\%$ ), that physical education was providing motivation in pursuing other goals ( $n = 54, 15\%$ ), and that physical education was providing a socially healthy environment for peer-to-peer socialization ( $n = 14, 4\%$ ).

## Motivation for Physical Education and Physical Activity

We used logistic regression to identify possible motivators in the expectancy-value framework for the students' choice decisions. The predictors included dimensions of the expectancy-value construct and types of motivation cost (dummy coded as a categorical predictors using an assigned dummy code in contrast to 0 to distinguish a specific cost type from the others). The statistics in Table 3 show that the decisions about continuing physical education (Yes or No) were determined by the Intrinsic Interest Value ( $B = 0.80$ , logistic regression coefficient) and the Utility Value ( $B = 0.70$ ). By transforming the logit  $B$  coefficients for interpretation, we obtained the

**Table 2 Liking/Disliking Physical Education and Self-Initiated Physical Activity**

	Inactive	Active
Like physical education	27 (42%)	37 (58%)
Dislike physical education	120 (42%)	167 (58%)
Total	147 (42%)	204 (58%)

$\chi^2 = .003, P = .96$

**Table 3 Logistic Regression Analysis Results (N = 350, df = 1)**

	$R^2$	$B$	Exp ( $B$ )	SE	Wald	$P$
Constant		-3.10	0.045	1.04	8.92	.003
Interest	.18	0.80	2.24	0.26	9.67	.002
Utility	.17	0.70	2.02	0.24	8.54	.003

*Note:* Dependent Variable: Choice decision for physical education (Dummy code: Not continue = 0, Continue = 1);  $R^2$  is for the predictor specified, independent from the other predictor. Exp ( $B$ ): Odds ratio. When Exp ( $B$ ) = 1.0, odds are 50/50 for the event (Yes decision in this case) to occur; when Exp ( $B$ ) > 1.0, the odds increase; when Exp ( $B$ ) < 1.0, the odds decrease.

odds ratio (Exp  $B$ ) of 2.24 for Intrinsic Interest Value and 2.02 for Utility Value. The coefficients indicate that when rating on Intrinsic Interest or Utility increased by 1 unit, the odds of deciding to continue physical education would increase by a factor of 2.24 and 2.02, respectively. The model-fit analysis resulted in a 90.3% correct overall prediction (Yes and No) and a 99.7% for the Yes decision.

In a multiple regression analysis conducted to identify possible motivators for the students' self-initiated after-school physical activity showed that daily self-initiated physical activity was motivated by Attainment Value (important to health,  $R^2 = .20$ ,  $\beta = .30$ ,  $P = .009$ ). Neither Intrinsic Interest, Utility, or Cost entered into the equation.

## Discussion

In this study, we identified and described the role of the expectancy beliefs and perceived values associated with Chinese college students' motivation for mandatory physical education and self-initiated after-school physical activity. The results suggest that these Chinese students had moderate and realistic expectations for success in physical education, valued the importance of physical activity to health, and considered the content of physical education interesting and useful. Although they might not like the mandatory physical education curriculum and perceived many reasons to be a cost to their motivation, they were still motivated enough to decide to continue to take physical education. More important, the results indicate that motivation for physical education and for self-initiated physical activity derive from different perceived values. The Attainment Value played a central part in self-initiated physical activity, and the Intrinsic Interest and Utility values were the primary motivators for continuing physical education. Taken together, the findings imply a complex relationship of motivation specificity<sup>20</sup> between physical education and developing and sustaining a physically active lifestyle.

The study was guided by 3 related hypotheses: (a) students would be able to identify different types of cost to motivation as well as positive expectancy beliefs and values in physical education; (b) perceived values would be the major motivators for choice decisions and self-initiated physical activity; and (c) motivation for physical education and self-initiated physical activity would rely on differentiated expectancy beliefs and value dimensions (Attainment Value, Intrinsic Interest Value, Utility Value, and Cost). Taken together, the results support these hypotheses.

### Answer to Hypothesis 1: Feelings Might Not Be a Determinant

Most participants did identify various types of cost associated with a Disliking feeling about physical education. The analysis on the Cost dimension revealed a strong "bitter-sweet" feeling about physical education. A detailed analysis of the qualitative responses reported elsewhere<sup>21</sup> documented an array of reasons leading to perception of cost and the students' reasoning on why they should overcome these costs and continue physical education. The cost reasons, briefly listed in the Results section, seem to lead the students to a subjective "bitter" feeling of disliking physical education. As shown in both regression analyses, however, this

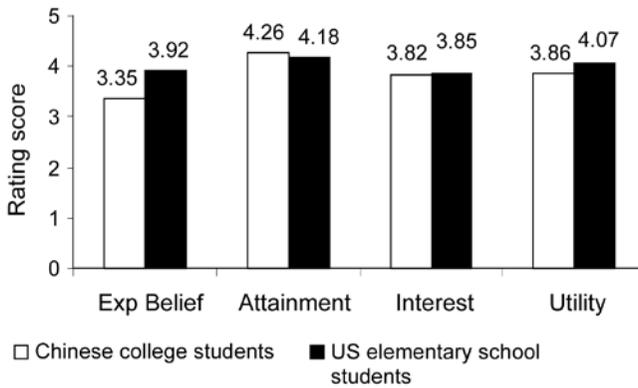
“bitter” feeling did not turn up as a viable determinant for either choice decisions or self-initiated physical activity. In contrast, they determined that physical education was “interesting” and “useful.” These 2 “sweet” values motivated them to continue physical education.

An important and likely controversial finding in this study is that feelings about physical education (Liking or Disliking) did not bear any association with the students’ self-initiated physical activity (Table 2). The number of Chinese students who were physically active (58%, see Table 2) is comparable with that of US college students (50% to 60% active 3 to 5 time a week and 40% to 50% inactive) based on a consensus estimate in a recent review of research findings.<sup>22</sup> Although most students in the sample, unfortunately, disliked physical education for one reason or another, the “bitter” feeling did not deter them from participating in self-initiated physical activity during after-school hours. The finding seems to reinforce the criticism of physical education curriculum as being disconnected from what is valued beyond physical education.<sup>23</sup> The important and useful information about physically active living embedded in the physical education curriculum might not be explicitly conveyed to the students especially in the mandatory, assessment-driven, centralized education system in these Chinese universities. Thus, what is positively experienced in physical education might or might not directly contribute to self-initiated physical activity.

## Answer to Hypothesis 2: Perceived Values Count

The data showed a striking similarity in the responses to perceived values between the Chinese college students and a sample of US elementary school students in a running program.<sup>17</sup> We placed means from the 2 studies in Figure 1 and observed a clear pattern that students in both samples rated the Attainment Value the highest and Intrinsic Interest and Utility values similarly. For the US children,<sup>17</sup> the Attainment Value is the sole predictor for persistence and effort in running; in our data it is the sole predictor for self-initiated physical activity. For the US children, Intrinsic Interest is a strong predictor for continuing a running program; in our data it is a strong predictor for the Chinese students’ decision to continue physical education. Although the above comparison is not statistically sound, the similar pattern of the responses does suggest that the importance of physical activity (Attainment Value) is acknowledged by students in both samples drawn from different countries at different educational stages.

Compared with the expectancy beliefs, perceived values seem to be stronger predictors for choice decisions and self-initiated after-school participation. On a 5-point scale, the Chinese college students returned a mean of 3.35, with a typical normal distribution (Skewness =  $-.048$ , see Table 1), indicating a strong centralized expectancy for success in physical education. The role of the expectancy beliefs, however, seems weak in our sample. It did not demonstrate any predictive power for physical education choice decisions and after-school physical activity. Because students’ assessment of their own competence for success becomes more accurate and realistic as they grow older,<sup>24</sup> we suspect that by the time they are in college, the students were realistic about their expectations for success in physical education. They might not rely on the expectancy beliefs for motivation in physical education and physical activity. The fact that the Intrinsic Interest and Utility values



**Figure 1** — Responses comparison of Chinese college students and US elementary school students.

predicted physical education choice decisions and the Attainment value predicted self-initiated physical activity suggests that helping students understand task values might be more effective than helping them know self-ability in motivating them in physical education and physical activity.

### Answer to Hypothesis 3: Meaning of Motivation Specificity

From the logistic regression results, we learned that understanding the importance of physical activity might not be a motivator as effective as knowing the interest and utility values in physical education. When the content is perceived as interesting and useful, the odds for the students to continue physical education were likely to increase 2-fold on each component. In a sharp contrast, the multiple linear regression analysis revealed that knowing the importance was the sole motivator for self-initiated physical activity.

Motivation functions in a dynamic interaction within and across different content domains. The nature of content is a dominant force to determine what factors (situational attractions, individual mental dispositions) motivate the student in the dynamics of the person-content interaction.<sup>20</sup> Our data indicate that the nature of the physical activities offered in physical education and those being performed during after-school hours were perceived by the students as having different embedded values. The evidence suggests a possibility that the motivation for the Chinese students in physical education is based on values different from those that motivate them to engage in self-initiated physical activity during after-school hours.

The result might present a puzzle: Since our data showed that knowing the importance (attainment value) was a key motivator for self-initiated physical activity, we would naturally conclude that physical education should be focused on revealing the importance of physical activity to health to motivate students to learn in physical education. But this attainment value might not be an effective motivator in physical education, because the students were likely to have known the importance as early

as elementary school years.<sup>17</sup> Rather, they were drawn to physical education by interest in and usefulness of the content. This puzzle challenges us to think about how the content important to health can be taught in ways perceived interesting and useful by students. Further research is needed to address this challenging issue by including content-specific characteristics in motivation research.

## Summary and Limitations

The study has provided evidence suggesting the importance of understanding the differentiated motivation function of the expectancy-value construct in relation to Chinese college students' choice decisions to continue physical education and self-initiated physical activity. The findings remind us that at the college level, the task values might be a motivator for choice decisions and daily physical activity behavior. The students are likely to have a realistic and accurate assessment of their competence, which leads to a moderate but realistic expectation for success. The evidence indicates that the students who do not like physical education are still likely to be physically active. The findings suggest a possible constraint of providing "feeling good" content as the sole motivation strategy for developing and sustaining physically active behavior.

A strong limitation for generalizing the findings derives from the context in which the study was conducted. Physical education in the Chinese colleges is based on a centralized curriculum. The second limitation is that physical education is mandatory for all students. Thus, the variable of choice decisions was highly hypothetical, which means the students knew that their responses were addressing a hypothetical situation. It is necessary to consider this unique measurement environment when one attempts to generalize the finding. Lastly, although we guarded against threats to validity and reliability of the measures, the data, after all, were based on self-reports. The common weakness with self-report data should be taken into account when considering generalizing the findings.

## References

1. Ji C, Sun J, Chen T. Dynamic analysis on the prevalence of obesity and overweight school-age children and adolescents in recent 15 years in China. *J Epidemiol China*. 2004;25(2):103-108.
2. Corbin CB. Physical activity for everyone: what every physical educator should know about promoting lifelong physical activity. *J Teach Phys Educ*. 2002;21:128-144.
3. Cone SL. Pay me now or pay me later: ten years later and have we seen any change? *J Teach Phys Educ*. 2004;23:271-280.
4. Eccles JS, Wigfield AA. In the mind of the actor: the structure of adolescents' achievement task values and expectancy-related beliefs. *Pers Soc Psychol Bull*. 1995;21:215-225.
5. Hensley LD. Current status of basic instruction programs in physical education in American colleges and universities. *J Phys Educ Rec Dance*. 2000;71(9):30-36.
6. Sparling P, Owen N, Lambert V, Haskell W. Promoting physical activity: the new imperative for public health. *Health Educ Res*. 2000;15:367-376.
7. Wigfield A, Eccles JS. The development of achievement task values: a theoretical analysis. *Dev Rev*. 1992;12:265-310.

8. Weiner B, Frieze I, Kukla A, Reed L, Rest S, Rosenbaum RM. *Perceiving the Causes of Success and Failure*. Morristown, NJ: General Learning Press; 1971.
9. Bandura A. *Social Foundations of Thought and Action: A Social Cognitive Theory*. Englewoods Cliffs, NJ: Prentice-Hall; 1986.
10. Dweck CS, Leggett EL. A social-cognitive approach to motivation and personality. *Psychol Rev*. 1988;95:256-273.
11. Nicholls JG. Achievement motivation: conceptions of ability, subjective experiences, task choice, and performance. *Psychol Rev*. 1984;91:328-346.
12. Atkinson JW. Motivational determinants of risk taking behavior. *Psychol Rev*. 1957;64:359-372.
13. Jacobs JE, Lanza S, Osgood EW, Eccles JS, Wigfield A. Changes in children's self-competence and values: gender and domain differences across grades one through twelve. *Child Dev*. 2002;73:509-527.
14. Wigfield A. Expectancy-value theory of achievement motivation: a developmental perspective. *Educ Psychol Rev*. 1994;6:49-78.
15. Xiang P, McBride RE, Guan J, Solmon M. Children's motivation in elementary physical education: an expectancy-value model of achievement choice. *Res Q Exerc Sport*. 2003;74:25-35.
16. Xiang P, Chen A, Bruene A. Interactive impact of intrinsic motivators and extrinsic rewards on behavior and motivation outcomes. *J Teach Phys Educ*. 2005;24:179-197.
17. Xiang P, McBride RE, Bruene A. Fourth-grade students' motivational changes in an elementary physical education running program. *Res Q Exerc Sport*. 2006;77:195-207.
18. Eccles JS, Adler TF, Meece JL. Sex differences in achievement: a test of alternative theories. *J Pers Soc Psychol*. 1984;46:26-43.
19. Bouchard C, Tremblay A, LeBlanc C, Lortir G, Savard R, Theriault G. A method to assess energy expenditure in children and adults. *Am J Clin Nutr*. 1983;37:461-467.
20. Bong M. Between- and within-domain relations of academic motivation among middle and high school students: self-efficacy, task-value, and achievement goals. *J Educ Psychol*. 2001;93:23-34.
21. Liu X, Chen A. *Cost, Choice Decisions, and Task Values: Expectancy-Value Based Motivation in Physical Education*. Paper presented at: American Educational Research Association 2006 annual meeting; April 2006; San Francisco, CA.
22. Keating XD, Guan J, Piñero JC, Bridges DM. A meta-analysis of college students' physical activity behaviors. *J Am Coll Health*. 2005;54(2):116-125.
23. Corbin CB. Physical education as an agent of change. *Quest*. 2002;54:182-195.
24. Alexander PA. *Psychology in Learning and Teaching*. Columbus, OH: Prentice-Hall; 2006.