

# A study on the relationship between physical exercise and teenagers' happiness from the perspective of self-determination theory

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**Abstract:** In the current physical education, adolescents are required to change passive participation to active participation in the exercise process, and motivation is the key factor of individual active participation. This study adopts the motivation theory related to happiness-self-determination theory, combines the research status of happiness at home and abroad, the research status of self-determination theory, the application status and existing problems of the two in the field of sports, and puts forward the development space of this research field in the future.

**Keywords:** Self-determination Theory; Physical Exercise; Happiness; Motivation

## 1. Introduction

At present, self-injury incidents among teenagers in China occur frequently, and the trend of depression is becoming more and more obvious. In view of the high incidence and serious trend of adolescent mental health problems, the State Council and the Education Department have successively issued a series of important documents, such as the Notice on Strengthening the Management of Students' Mental Health, the Notice on Several Measures for Comprehensively Strengthening Children's and Adolescents' Mental Health, and the Outline of Healthy China 2030 [1,2]. It has become the common expectation of the whole society to vigorously solve the mental health problems of adolescents and ensure their happy and healthy growth. At the same time, with the implementation of the policy of double reduction and the policy of physical education reform in the senior high school entrance examination, sports activities occupy an increasingly important position in the school life of teenagers. Simple mental health theory course can not effectively solve the mental health problems of teenagers, and it needs to be combined with actual individual activities, especially with teenagers' daily physical exercise activities. The growth of teenagers runs healthily under the condition of common physical and psychological development, and the daily physical activities of individuals have an important impact on their mental health development. Exploring the relationship between physical exercise and teenagers' happiness and its specific promotion path is of great significance for the subsequent development and in-depth reform of school physical education, and will also promote the improvement of teenagers' mental health problems, which is conducive to the further implementation of the Healthy China Action. Therefore, this paper summarizes the research status of happiness, self-determination theory and the application status of physical exercise and happiness in school physical education, and points out the follow-up development space.

## 2. Research status of happiness

Happiness, which reflects the level of individual mental health, came into being in the middle and late 20th century [3], and it mainly went through three stages of development [4]: description comparison, theoretical construction and measurement development. From the research orientation, happiness can be divided into three categories: subjective happiness developed from happiness theory, psychological happiness evolved from realization theory, and social happiness proposed by social happiness theory model [5-7]. Since the end of the 20th century, the research on subjective well-being and social well-being has gradually shown a trend of integration [8]. The influencing factors of happiness are divided into internal and external aspects, in which the external factors include the influence of objective factors such as quality of life and demographic variables, while the internal factors explain the development of happiness from the perspective of individual personality traits [5,9,10].

The study of happiness abroad is a process from outside to inside, from shallow to deep. The early research on happiness focused on demographic variables, economic factors and other objective factors: the relationship between income, age and happiness, the relationship between national wealth and happiness, and the relationship between material goals and happiness [11-13]. With the deepening of research, scholars have gradually shifted their research focus to internal factors such as personality traits: personality factors can be used as a good predictor of happiness, and personality traits can have a great impact on happiness [14,15]. In the process of modernization, the research on happiness focuses on family, society, internal mechanism and theoretical relationship, such as the relationship between marriage and happiness change, the relationship between workplace spirit and employee well-being, the relationship between happiness and emotional intelligence, and the relationship between psychology and subjective happiness [16-19]. Generally speaking, the development of happiness shows the trend of deepening, systematization and application.

The development of domestic happiness lags behind that of foreign countries in time. Therefore, from the development stage, the research on domestic happiness is a process from the stage of drawing lessons from and introducing foreign research results to the stage of domestic localization research [8]. From the research group point of view, the early domestic research on happiness started from the elderly group [20]. Since the end of the 20th century, the research objects have been gradually enriched: from focusing on the happiness of college students and teenagers to studying the happiness of enterprise employees and urban and rural residents [21-24]. From the research direction, the domestic early stage mainly focused on the study of subjective well-being, and so far, the domestic research level of subjective well-being is slightly mature in psychological well-being [25,26]. In recent years, social well-being has been paid more and more attention, and at the same time, subjective well-being and psychological well-being tend to be integrated for research [27,28]. Generally speaking, the research on happiness in China has made rich achievements, but it is still not mature enough compared with foreign countries. The research on happiness in the later period can start from interdisciplinary research, intervention research and enriching local research tools.

### 3. Research status of self-determination theory

As a theoretical model related to happiness, self-determination theory was put forward by Deci et al., and its theoretical basis includes motivation integration theory, motivation evaluation model, intrinsic motivation theory and basic needs theory [4,29]. The theory of self-determination consists of a meta-theory and four sub-theories: the basic psychological needs theory is the meta-theory, and the cognitive evaluation theory, organic integration theory, causal orientation theory and goal content theory are the sub-theories [30]. Self-determination theory, as one of the eight main theories of motivation, has an important influence on individual happiness by studying the changes of internal and external motivation [31]. On the other hand, interdisciplinary research combining self-determination theory with physical education has also received extensive attention at home and abroad in recent years [32].

At first, the study of internal and external motivation was conducted separately by self-determination theory in foreign research. After the self-determination theory was developed more perfectly, scholars gradually classified internal and external motivation into a unified continuum based on a lot of research in the field of rehabilitation and exercise [33,34]. Li through a series of research on exercise environment and physical activities, internal motivation is divided into three categories: learning, completion and stimulation [35]. Therefore, the research in the field of sports has promoted the perfection and development of self-determination theory to a certain extent. At the same time, the application of self-determination theory in the field of sports also promotes the further study of physical activity: physical activity is divided into different types of physical activity motives and physical activity goals based on self-determination theory, and the related influencing factors of physical activity motives are explored [35]. In the development of measurement tools, researchers have also compiled many scales related to sports and exercise according to the self-determination theory: exercise motivation scale, exercise target content scale, exercise causal orientation scale, etc. [35-37]. Generally speaking, the theory of self-determination has made rich achievements in the field that motor skills, cognitive learning and physical activity are equal to the intersection of physical education disciplines, and researchers have fully pointed out how to use the theory of self-determination to mobilize internal motivation to make individuals develop better in the process of physical activity [38-40].

Domestic self-determination theory has also been developed to some extent in the field of sports.

From the perspective of research groups, China involves enterprise employees, middle-aged and elderly people, middle school students, college students, urban and rural residents, etc. [31,41,42], which is relatively rich and comprehensive, but the focus of research is more on the sports activities of middle school students, especially the physical exercise at school [43]. From the perspective of research tools, most of the scales imported from abroad are adapted or used in China, and there are few scales that combine self-determination theory with exercise, and there are problems such as uneven quality of scale use and inconsistent measurement tools [44]. From the perspective of self-determination theory itself, there is also a problem of insufficient research on the internal mechanism of the theory in China [31]. Generally speaking, domestic self-determination theory still has a lot of room for development in the field of sports.

#### **4. Application status and problems of self-determination theory in sports field**

##### ***4.1. Application status of self-determination theory in sports field***

As mentioned above, at present, the research on the application of self-determination theory in the field of sports in foreign countries has been very fruitful. Based on a lot of research in the field of rehabilitation and exercise, many scales related to sports and exercise have been compiled abroad. Therefore, the development of research tools and theoretical basis abroad is quite mature and perfect. In the specific application of physical education classroom, foreign scholars have adopted a large number of empirical research methods such as longitudinal follow-up, natural experiments and experimental investigations to further explore the application value of self-determination theory in physical education classroom [45,46]. By manipulating or recording students' motivation and mental health in the process of participating in physical education classes, researchers have made rich achievements in sports skills, cognitive learning and physical activities [38-40]. At present, foreign physical education classes have been able to skillfully use motivation theory to influence students' physical exercise participation and mental health from the aspects of teaching environment, teacher-student relationship and students' learning goals.

Our country draws lessons from the theoretical and empirical research experience of foreign self-determination theory in the field of sports, and at present, it has also made the initial development of self-determination theory in the combination with physical education. First of all, the research method is mainly survey, and the research tools rely on foreign scales [44]. Most domestic scholars use the method of cross-sectional study to issue questionnaires to study the motivation and mental health level of teenagers in physical education class [41,42]. The scale used in the study mainly refers to the scale in international literature, and lacks the self-made scale. Secondly, the theoretical research focuses on the basic psychological needs theory and the level of independent motivation. Domestic research mostly uses one of the scales for measuring basic psychological needs or autonomous motivation to measure individual motivation level, and the research content is relatively simple and incomplete [31]. Finally, the influencing factors pay more attention to the influence of external environment on physical exercise. At present, China pays attention to the influence of external environmental factors such as classroom atmosphere and teachers' style on the motivation level and mental health status of middle-aged and young people in physical education class [47], but there is little research on the influence of internal factors such as students' learning goals.

##### ***4.2. Problems in the application of self-determination theory in domestic sports field***

Combining with the development status of physical education class in China, applying the theory of self-determination to physical education class will definitely promote the improvement of physical education class quality. At present, there are the following problems in the research and application of self-determination theory in physical education in China: 1) The research tools are immature and the research methods are single. As mentioned above, many domestic studies directly apply the foreign ready-made scale, without any localization modification, without considering the external validity of the scale, and the research tools are not mature enough. The research method mostly adopts the horizontal questionnaire survey method, but does not carry out the longitudinal survey and experimental research with timeliness. At the same time, we should also refer to foreign research models, combine theory with classroom content, and use questionnaire survey to study students who have received classroom teaching with motivation theory and students who have received classroom teaching without motivation theory, so as to get more practical research results. 2) The theoretical mechanism is single and incomplete, and the application of theory is uneven. Domestic research mostly

adopts a certain sub-theory in the self-determination theoretical model, and lacks the combination of several theories and the research on the internal operation mechanism of its theoretical model. In the future, we can combine the sub-theories together to build a structural equation model, explore its internal operating mechanism, and build a sound theoretical basis for formulating intervention strategies in the future. 3) The research angle of motivation is single, focusing on external motivation. In China, the influence of teachers' teaching atmosphere and teaching style on classroom effect and students' psychological state in physical education class is mostly studied. Lack of research on students' internal learning objectives and participation motivation. In addition, there are also shortcomings in the study of external motivation, lack of research on other external factors such as reward, positive feedback and peer relationship, and the research perspective needs to be expanded.

## 5. Conclusions and Prospects

To sum up, foreign research on happiness and self-determination theory in the field of sports have formed a relatively perfect theoretical system and research tools, and have also achieved rich empirical results on the basis of a large number of empirical studies. Many classic research paradigms, research theories and research methods combining questionnaires and experiments are worth learning from. On the other hand, in China, the research and development of the theory of happiness and self-determination is still not mature enough, and the research tools used are miscellaneous and inconsistent. There is a lack of research on the internal theoretical mechanism in theoretical research, and there are also many shortcomings in investigation and empirical research in application. The relationship between physical exercise and happiness still has a lot of research space on the basis of self-determination theory. How to use this motivational theory to adjust the external environment, interpersonal relationship and individual internal state of physical exercise, so that physical exercise can play a more effective and positive role in happiness is of great significance to school physical education. In terms of research methods, the follow-up research in this field can change the single horizontal investigation method, increase the longitudinal tracking investigation method, increase the experimental research method, or adopt the research method of combining experiment and investigation; From the point of view of theoretical application, apart from the application of basic meta-theory, we can also apply sub-theory to study according to the relationship within the theoretical system, and increase the research on internal mechanism; From the research content, the research on the influence of physical exercise on teenagers' happiness should not only test the effect of physical exercise and happiness level of teenagers, but also combine it with physical education classes to study the changes of teenagers' happiness level after accepting physical education classes with different motivation content and target content.

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