중국 대학생의 그릿과 훈련 만족도의 관계에서 코치의 리더십 행동과 집단 응집력의 이중매개효과

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Dual Mediating Effects of Coach Leadership Behavior and Group Cohesion between Grit and Training Satisfaction in Chinese College Students

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요 약 본 연구는 중국 대학생을 대상으로 코치의 리더십행동과 집단응집력이 그릿과 훈련만족도의 관계에서 이중매개하는지를 확인하는데 연구의 목적이 있다. 자료는 중국 광동지역 한 대학교에서 유의표집한 대학생 313명을 대상으로 설문조사를 통하여 수집하였다. 수집한 자료는 SPSS PC+ Win ver. 25.0과 SPSS PROCESS macro ver. 4.2를 활용하여 분석하였다. 적용된 통계방법은 빈도분석, 신뢰도분석, 상관분석 및 이중매개효과 분석이었다. 연구의 결론은 다음과 같다. 첫째, 그릿, 코치 리더십 행동, 집단응집력 및 훈련만족도는 모두 정적인 유의미한 상관관계를 보였다. 둘째, 코치의 리더십 행동과 집단응집력은 그릿과 훈련만족도의 관계에서 이중매개하였다. 이러한 결과를 토대로 본 연구는 대학생들의 훈련만족도 증진을 위하여 그릿만이 아니라 코치의 리더십행동과 집단응집력을 활용할 수 있는 방안을 제언하였다.

주제어 그릿, 리더십행동, 집단응집력, 훈련만족도, 대학생, 이중매개효과

Abstract This study aims to determine whether coach leadership behavior and group cohesion mediate in the relationship between grit and training satisfaction among Chinese college students. Data were collected through a survey targeting 313 college students purposively sampled at a university in Guangdong, China. The collected data was analyzed using SPSS PC+ Win ver. 25.0 and SPSS PROCESS macro ver. 4.2. The statistical methods applied were frequency analysis, reliability analysis, correlation analysis, and dual mediation effect analysis. The conclusion of the study is as follows. First, grit, coach leadership behavior, group cohesion, and training satisfaction all showed significant positive correlations. Second, the coach's leadership behavior and group cohesion double-mediated in the relationship between grit and training satisfaction. Based on these results, this study proposed a plan to utilize not only grit but also coach leadership behavior and group cohesion to improve college students' training satisfaction.

Key Words Grit, Leadership behavior, Group cohesion, Training satisfaction, College students, Double mediation

1. Introduction

For athletes, training satisfaction is a significant factor that reflects performance such as performance improvement and skill improvement. In particular, sports athletes are very sensitive to training satisfaction because training satisfaction occurs through long-term efforts. One of the variables that affects training satisfaction is grit. Grit has been reported as a strong predictor of success [1] and is receiving research attention in various academic fields. However, in the sports field, there has been a lot of interest in training satisfaction such as performance and technology. Still, there is a lack of research in the psychological field such as grit, so academic interest in the relationship between grit and training satisfaction is needed.

Another variable that increases training satisfaction is the coach's leadership behavior. A coach's leadership behavior can be predicted to be related to grit. In numerous studies, grit, which refers to long-term persistence and passion, has been reported to have a positive influence on a coach's leadership behavior [2]. On the other hand, the coach's leadership behavior was reported to have contributed to the players' skill improvement and goal achievement [3,4]. It is predicted that grit affects the coach's leadership behavior, and the coach's leadership behavior affects training satisfaction. It is predicted that grit mediates in the relationship between these two variables, and this needs to be confirmed.

As a variable that affects training satisfaction, group cohesion is an important variable for sports athletes. A study was reported showing that consistency of interest, a subfactor of grit, and group cohesion show a positive significant correlation [5]. There are only a few studies on the relationship between grit and group cohesion. On the other hand, lots of studies showing that group cohesion affects training satisfaction have been conducted [6]. Based on these previous research results, group cohesion was predicted to mediate in the

relationship between grit and training satisfaction. There is a need to confirm the mediating role of group cohesion among Chinese college students. Furthermore, there is a lack of research on whether a coach's leadership behavior and group cohesion dually mediate grit and training satisfaction, so research on this is also needed.

Therefore, this study aims to determine whether coach leadership behavior and group cohesion mediate in the relationship between grit and training satisfaction among Chinese college students. To achieve this research purpose, the following research questions were set. First, what is the correlation between major variables? Second, do coach leadership behavior and group cohesion mediate the relationship between grit and training satisfaction?

2. Theoretical background

2.1 Relationship between grit and training satisfaction

Grit is the trait of maintaining interest and persistent effort to achieve long-term goals [7]. Grit is characterized by a long period (about 5 years), the consistency of interest so that the goal does not change, and the persistence of effort for 5 years without interruption. This grit is closely related to success and academic achievement, and in particular, it has been shown to predict school performance better than intelligence quotient (IQ) [8].

Meanwhile, satisfaction is a psychological response and is a satisfying, enjoyable, and positive emotional state as a result of an individual's evaluation obtained through job experience [9]. Therefore, training satisfaction refers to meeting expectations for rewards and results such as a sense of accomplishment, self-efficacy, and skill improvement that come from achieving learning goals that can be obtained by taking educational training [10]. Additionally, training satisfaction is a pleasant and positive emotional state that

occurs after an individual experiences specific training for a certain period [11].

Grit and training satisfaction are closely related. Grit can be said to be the driving force that increases training satisfaction. In a longitudinal study targeting 390 teachers, novice teachers' grit and life satisfaction predicted students' academic progress [12]. Learners with high grit receive information and feedback that helps them achieve success through sustained effort and use more effective learning strategies to improve their academic ability. This series of processes ultimately has a positive impact on academic achievement [13]. Therefore, grit is considered an important variable predicting satisfaction with education and training. However, research on grit and training satisfaction is still insufficient.

2.2 Mediating effect of coach leadership behavior

Leadership is defined as the process of influencing the behavior of organizational members to achieve organizational goals and maintain morale [14]. In other words, leadership provides voluntary participation and energy to organizational members through the presentation of a vision to promote organizational growth. It refers to influence in bringing about innovation. Coach leadership refers to the coach's positive influence on students in a training program.

For coach leadership behavior to play a mediating role in the relationship between grit and training satisfaction, grit must affect coach leadership behavior, and coach leadership behavior must affect training satisfaction. This was considered in previous research. coaching leadership was reported to have a positive effect on grit [2]. Among the sub-factors of self-leadership, natural compensation strategy, constructive thinking strategy, and action-oriented strategy were found to have a significant positive influence on the persistence of effort, which is a sub-factor of grit [15].

On the other hand, looking at the relationship between coach leadership behavior and training satisfaction, many studies have reported that leadership has a positive effect on training satisfaction. In sports, the leader's leadership has a significant impact on the player's performance [4]. It was reported that the instructor's leadership contributed to the improvement of players' skills and the achievement of their goals [3]. Considering these previous studies, coach leadership behavior was predicted to play a mediating role in the relationship between grit and training satisfaction, and researchers sought to verify this mediating role with Chinese college students.

2.3 Mediating effect of group cohesion

Group cohesion is a property of a group related to its ability to defend against group disintegration and is a combination of forces that allow members to remain in the group [16]. Also, group cohesion is defined as the sum of all forces acting on group members so that they remain in the group [17].

Researchers examined whether this group cohesion mediates in the relationship between grit and training satisfaction.

In a study targeting college students, consistency of interest and group cohesion, which are subfactors of grit, showed a significant positive correlation [18]. It is judged to be the result of long-term passion and persistence effectively contributing to group cohesion.

Looking at the effect of group cohesion on training satisfaction, team cohesion was found to increase player satisfaction by indirectly affecting players' skills and tactics as well as their performance [19]. Team cohesion was reported to increase group efficiency and contribute to achieving goals [6]. Although there is not much prior research, group cohesion is predicted to mediate between grit and training satisfaction. Therefore, this study aims to test whether group cohesion mediates in the relationship between grit and training satisfaction and whether coach leadership behavior and

group cohesion mediate in the relationship between grit and training satisfaction, targeting Chinese college students.

3. Methods

3.1 Research model

To confirm whether coach leadership behavior and group cohesion double mediate the relationship between grit and training satisfaction, model number 6 of the SPSS PROCESS macro proposed by Hayes [20] was applied, and the research model was set up as shown in Figure 1. It was attempted to control college students' gender, age, grade, and school type, which affect the mediating and dependent variables.
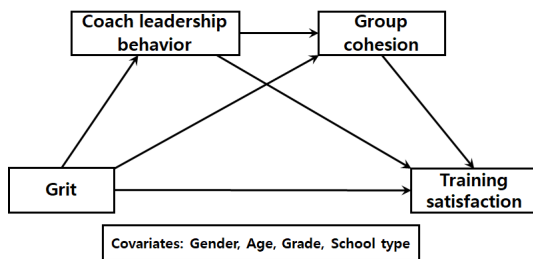
[Fig. 1] Research model

3.2 Participants and data collection

The Guangdong region in China was purposively selected as the study area, and the subjects of the study were college students of playing ball games. The purposive sampling method was applied to sample college students. Data was collected through an online survey from March to June, 2023. Excluding insincere responses, the total number of subjects used in the final analysis was 313 students. The general characteristics of the survey subjects were 49.5% male and 50.5% female. By grade, 82.4% were first graders, 9.6% were second graders, 6.1% were third graders, and 1.9% were fourth graders.

3.3 Research tools

3.3.1 Grit

The grit scale in this study used the short grit scale developed by Duckworth and Quinn [1] and used by Hwang and Lee [21]. This scale is designed to measure long-term passion and perseverance such as "Setbacks don't discourage me" and "New ideas and projects sometimes distract me from previous ones" and consists of a total of 8 questions. The measurement was done on a 5-point Likert scale, with higher scores indicating grit. In this study, the reliability of this scale, Cronbach's α, was suitable at .805.

3.3.2 Leadership behavior

The leadership behavior scale in this study used the sports leadership scale used by Sriboon [22]. This scale is designed to measure coaches' leadership behavior, including 4 dimensions of training and teaching behavior: democratic behavior, autocratic behavior, social support behavior, and reward Behavior such as "I hope my coach sees if the players are reaching their potential" and "I hope my coach to explain the moves and routes to each player", and consists of a total of 25 questions. The measurement was done on a 5-point Likert scale, with higher scores indicating higher leadership behavior. In this study, the reliability of this scale, Cronbach's α, was high at .917.

3.3.3 Group cohesion

The group cohesion scale in this study used the group environment scale used by Turner [23]. This scale is designed to measure four dimensions of group task attraction, group social attraction, group task consistency, and group social consistency such as "I would like to be a member of the team's activities" and "I will miss the members of this team when I leave", and consists of a total of 15 questions. The measurement was done on a 5-point Likert scale, with higher scores indicating higher group cohesion. In this study, the reliability of this scale, Cronbach's α, was suitable at .759.

3.3.4 Training satisfaction

The training satisfaction scale in this study used the scale used by Turner [23]. This scale is designed to measure four dimensions of training status, coaching factors, individual conditions, and logistics conditions such as "I had plenty of time to recover from my training fatigue" and "The training funds of our sports team can be guaranteed", and consists of a total of 24 questions. The measurement was done on a 5-point Likert scale, with higher scores indicating higher training satisfaction. In this study, the reliability of this scale, Cronbach's α, was high at .947.

3.4 Data analysis

The data was analyzed using SPSS PC+ Win. Ver. 25.0 and SPSS PROCESS macro Ver. 4.2. For data analysis, frequency analysis, Cronbach's reliability, and Pearson's bivariate correlation analysis were conducted. Model 6 of the SPSS PROCESS macro was performed to analyze the dual mediating effect. For the verification of the dual mediating effect bootstrap method was used.

4. Results

4.1 Correlation of main variables

To determine the correlation between variables, Pearson's bivariate correlation analysis was performed, and the results are shown in Table 1. Grit is positively correlated with coach leadership behavior (r=.242, p< .01), group cohesion (r=.401, p<.01), and training satisfaction (r=.436, p<.01). Coach leadership behavior also showed a positive correlation with group cohesion (r= .557, p<.01) and training satisfaction (r=.578, p<.01). And group cohesion also showed a positive correlation with training satisfaction (r=.656, p<.01). The overall correlation coefficient was from .242 to .656, so there was no problem of multicollinearity.

As a result of descriptive statistical analysis, the averages of the main variables were all higher than the

median score of 3 points. Among them, coach leadership behavior was the highest at M=3.7369.

〈Table 1〉 Correlation analysis results

	1	2	3	4
1.Grit	1			
2.Coach leadership behavior	.242**	1		
3.Group cohesion	.401**	.557**	1	
4.Training satisfaction	.436**	.578**	.656**	1
M	3.524	3.7369	3.4447	3.6062
SD	0.59875	0.47939	0.38765	0.57616

**p<.01

4.2 Dual mediating effect of coach leadership behavior and group cohesion

To determine whether coach leadership behavior and group cohesion serially mediate in the relationship between grit and training satisfaction, model number 6 of the SPSS PROCESS macro was applied. The bootstrap confidence interval was set at 95%, the number of samples was set at 5,000, and gender, age, and grade were controlled during analysis. The analysis results are presented in Figure 2 and Table 2.
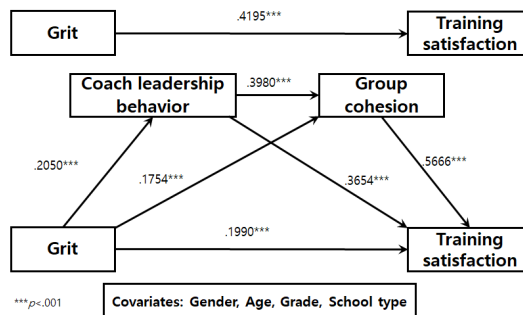
[Fig. 2] Statistical model of dual mediating effect

In the first mediating variable model, grit had a statistically significant effect on coach leadership behavior (M1) (B=.2050, p<.001). In the second mediating variable model, grit had a significant positive effect on

〈Table 2〉 Dual mediating effects of Coach leadership behavior and Group cohesion

Variables		Mediating variable model 1 (DV: Coach leadership behavior)			Mediating variable model 2 (DV: Group cohesion)			Dependent variable model (DV: Training satisfaction)		
		Coeffect	SE	t value	Coeffect	SE	t value	Coeffect	SE	t value
Constant		1.7639	.3964	4.4497***	1.1891	.2689	4.4223***	−1.0913	.3591	−3.0391**
ID	Grit	.2050	.0436	4.6996***	.1754	.0297	5.9080***	.1990	.0406	4.9052***
M1	Coach leadership behavior				.3980	.0375	10.6066***	.3654	.0568	6.4319***
M2	Group cohesion	.						.5666	.0740	7.6554***
Control variables	Gender	−.0280	.0519	−.5397	.0753	.0342	2.2030*	.0785	.0446	1.7603
	Age	.0378	.0438	.8635	−.0386	.0288	−1.3404	.0420	.0374	1.1225
	Grade	.2302	3.4562	.6849	.0662	2.4853	2.4853*	.1116	.0348	3.2040**
	School type	.0277	.0666	3.4562***	.0170	.3805	.3805	.0564	.0578	.9756
Model summary	R2	.1012			.4079			.5522		
	F	6.9158***			35.1286***			53.7211***		

Effects	Effect	SE	Confidence interval	
			LLCI	ULCI
Total effect	.4195	.0479	.3252	.5138
Direct effect	.1990	.0406	.1192	.2788
Total indirect effect	.2205	.0343	.1555	.2863
Indirect effect — Grit → Coach leadership behavior → Training satisfaction	.0749	.0215	.0374	.1223
Grit → Group cohesion → Training satisfaction	.0994	.0243	.0559	.1519
Grit → Coach leadership behavior → Group cohesion → Training satisfaction	.0462	.0128	.0224	.0711

*p<.05, **p<.01, ***p<.001, ID: Independent variable, DV: Dependent variable, M: Mediating variable

group cohesion (M2) (B=.1754, p<.001), and coach leadership behavior (M1) also had a significant positive effect on group cohesion (M2). (B=.3980, p<.001).

In the dependent variable model, grit had a significant positive effect on training satisfaction (B=.1990, p<.001), and coach leadership behavior (M1) also had a significant positive effect on training satisfaction (B=.3654, p<.001). Group cohesion (M2) had a significant positive effect on training satisfaction (B=.5666, p<.001). In other words, grit has a significant effect on coach leadership behavior (M1), coach leadership behavior (M1) has a significant effect on group cohesion (M2), and group cohesion (M2) has a significant effect on training satisfaction. Therefore, coach leadership behavior (M1) and group cohesion (M2) serially mediated in the relationship between grit and training satisfaction.

As a result of verifying the serial dual mediation effect of coach leadership behavior (M1) and group cohesion (M2) using bootstrap, the dual mediation effect was B = .0462, which was significant as there was no 0 between the lower and upper limit of the bootstrap (.0224~.0711). In other words, coach leadership behavior (M1) and group cohesion (M2) serially mediated in the relationship between grit and training satisfaction.

5. Discussion and conclusion

The discussion focusing on the results of the study is as follows.

First, grit, coach leadership behavior, group cohesion, and training satisfaction all showed significant

positive correlations. These results were consistent with research showing that training satisfaction was positively correlated with group cohesion [5], and research results showing that leadership influenced athletic performance [4]. This is consistent with research results showing that grit and life satisfaction are high [12]. These results show that training satisfaction is positively related to various variables, and has a particularly high correlation with group cohesion. It is necessary to find ways to improve training satisfaction by increasing group cohesion.

Second, the coach's leadership behavior and group cohesion double-mediated in the relationship between grit and training satisfaction. In other words, training satisfaction can be improved through the path of grit → coach's leadership behavior → group cohesion. Therefore, it was suggested that college students' training satisfaction can be improved by utilizing not only grit but also the path of grit → coach's leadership behavior → group cohesion.

The limitations of the study and suggestions for further research are as follows. First, one university selected for this study was intentionally sampled. Since this may result in sampling error, it is necessary to purposively sample at least three universities to reduce sampling error.

Second, countless psychological factors affect training satisfaction. In follow-up research, research is needed to further explore variables that affect training satisfaction, such as self-efficacy, hope, and growth mindset among positive psychological variables.

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