

# The Effects of Physical Activity on the Social Adjustment of College Freshmen: A Chain-Mediated Theoretical Model of Cognitive Reappraisal and Psychological Resilience with Moderating Effects of Perceived Social Support

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## Abstract

This study explored how participating in physical activities influences the social adjustment of college freshmen, focusing on the role of perceived social support and the chain effects of cognitive reappraisal and psychological resilience. A survey was conducted with 1,061 college freshmen from Zhejiang Province using five scales: the Physical Activity Scale, Perceived Social Support Scale, Cognitive Reappraisal Scale, Psychological Resilience Scale, and Social Adjustment Capacity Scale. The results showed that physical activity positively enhances social adjustment, with cognitive reappraisal and psychological resilience serving as mediators. Additionally, perceived social support was found to strengthen this chain-mediated relationship. This research provides new perspectives on the link between physical activity and social adjustment in college freshmen and offers practical suggestions for improving physical education programs.

## Keywords

Physical Activity, Cognitive Reappraisal, Psychological Resilience, Social Adjustment, Perceived Social Support, College Freshmen

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## 1. Introduction

The aim of this research is to investigate the effects of physical activity on the social adjustment of college freshmen, with a particular focus on the mediating roles of cognitive reappraisal and psychological resilience, as well as the moderating

effect of perceived social support. College freshmen are beginning their university journey, a time when they are highly influenced by their surroundings. These influences can affect their health and well-being, including their physical, emotional, and social adjustment. Difficulty adapting to college life can lead to struggles with adjustment, negatively impacting both their mental and physical health, as well as their overall personal growth (Li et al., 2022). As a result, helping first-year students transition smoothly, adapt to their new environment, and improve their social integration has become a key priority for higher education institutions. This unique group faces various challenges, including academic demands, relationship building, and social adaptation (Koo, Baker, & Yoon, 2021; Morales-Rodríguez et al., 2020).

Social adjustment refers to an individual's ability to achieve harmony with their social environment through behavioral and psychological adaptation (Hobfoll, 2002). When students enter a new environment and build new social relationships, they often experience tension, stress, and conflict. The transition from high school to college can be particularly challenging, with students facing increased risks of anxiety and depression if they struggle to adapt (Castro et al., 2024). The diverse nature of the college environment adds complexity, requiring students to think independently, form new relationships, and manage academic pressures (Mudhovozi, 2012). Social adjustment for college freshmen is a multifaceted process involving academic performance, interpersonal relationships, self-care, role adaptation, and career decision-making. This process significantly influences their psychological and physical well-being (Owusu-Agyeman & Mugume, 2023). Poor social adjustment can hinder identity formation and relationship building while also causing physiological issues like sleep problems, weakened immune function, and other health challenges. On the other hand, successful social adjustment is linked to better mental health and stronger social skills (Mathunjwa-Dlamini et al., 2022). These findings highlight the critical role of social adjustment in the college experience and emphasize the responsibility of universities to support freshmen in this transition. Guided by the general social adjustment model and social support theory, this study focuses on physical activity as a starting point to explore factors affecting freshmen's social adjustment. This approach aims to enhance their quality of life and mental health.

Physical activity is likely to positively impact the social adjustment of college freshmen. Research indicates that physical activity not only improves physical and mental health but also supports social adjustment among college students (Serretti et al., 2013). Studies have found a positive relationship between physical activity and aspects such as body image, acceptance, and social adjustment (Zhang et al., 2024). Athlete identity and gender also significantly influence acculturation in the context of sports (Self & Stowers, 2022). Additionally, body-related envy in sports can affect motivation and behavior, which subsequently influences social adjustment (Pila et al., 2014). Eime et al. (2013) highlighted the mental health and social benefits of physical activity for adolescents, such as higher self-esteem and fewer depressive symptoms. Research on specific sports, such as basketball, has shown

that it positively affects college students' social adjustment, with interpersonal relationships and self-identity acting as mediators (Haoran et al., 2023). Physical activity may also enhance psychological capital, reducing the likelihood of cell phone addiction and indirectly improving social adjustment (Chen et al., 2022).

Based on these findings, hypothesis H1 is proposed: participation in sports activities positively influences the social adjustment skills of college freshmen.

Cognitive reappraisal (CR) may function as a mediator in improving social adjustment through physical activity. CR is an emotion regulation strategy involving the reinterpretation of emotional events to adjust responses and perceptions before they occur (Gross, 1998). Research suggests that physical activity not only improves physical fitness but also enhances the use of cognitive reappraisal. For instance, Yang et al. (2024) found that physical activity positively influences college students' subjective well-being through cognitive reappraisal and psychological resilience. Athletes with strong cognitive reappraisal abilities often exhibit better emotional regulation and social connectedness (Kim & Tamminen, 2023; Xin et al., 2024). As an emotion regulation tool, cognitive reappraisal significantly affects social adjustment. According to emotion regulation theory, individuals adapt their emotional states to suit varying circumstances (Gross, 1998). CR has been shown to reduce social stress and improve mental health. Research highlights its critical role in adolescent self-adjustment, indicating that insufficient use of CR can lead to social anxiety and depressive symptoms (Dalimunthe & Nasution, 2023; Dryman & Heimberg, 2018). Furthermore, the ability to engage in cognitive reappraisal has been linked to reduced depressive symptoms, particularly in high-stress situations (Troy et al., 2010).

Based on the above study, hypothesis H2 is proposed: cognitive reappraisal plays a mediating role between physical activity and social adjustment.

Psychological resilience, defined as the ability to adapt effectively to adversity, trauma, or significant stress, is a key indicator of mental health (Rutter, 1990). It may act as a mediator in the relationship between physical activity and social adjustment. Research shows that physical activity significantly contributes to the development of psychological resilience (Chrétien et al., 2024). Athletes, in particular, develop psychological resilience through exposure to rigorous training and competitive pressures (Sarkar & Fletcher, 2014; Bryan et al., 2019). These experiences enhance their ability to recover from challenges through teamwork, positive social interactions, and effective coping strategies, ultimately fostering psychological resilience (Morgan, Fletcher, & Sarkar, 2013; Rosa & Arc-Chagnaud, 2020). Ungar's (2011) social construct of psychological resilience model emphasizes that resilience emerges from the interaction between social environments and individual traits. In this context, psychological resilience represents the resources and skills individuals use to adapt to adversity, aiding in psychological stability and positive social functioning under stress. Studies have shown that psychological resilience reduces stress, enhances emotional regulation, and improves social adjustment by fostering social support and stronger interpersonal relationships

(Falavarjani & Yeh, 2019). Additionally, psychological resilience plays a critical role in the social adjustment of adolescents and vulnerable groups, strengthening their coping abilities and improving their quality of life in challenging environments (Sahar & Muzaffar, 2017; Zhu et al., 2023).

These findings highlight the critical role of psychological resilience in enhancing social adjustment through physical activity. Based on this, Hypothesis H3 is proposed: psychological resilience mediates the relationship between physical activity and social adjustment.

A growing body of studies highlights the effectiveness of cognitive reappraisal, an emotion regulation strategy, in improving well-being. Jiang et al. (2023) revealed that cognitive reappraisal and psychological resilience mediate the effects of social support on post-traumatic growth in psychological hotline counselors. Higher levels of cognitive reappraisal are closely linked to greater psychological resilience, a strategy that strengthens an individual's ability to handle stress and adversity (Stover et al., 2024). Similarly, Yang et al. (2024) demonstrated that physical activity directly enhances college students' subjective well-being and indirectly improves it through the chain mediation of cognitive reappraisal and psychological resilience. Cognitive reappraisal also promotes social adjustment by positively influencing psychological resilience. As a protective strategy, cognitive reappraisal reduces negative emotional responses and improves adaptation, thereby enhancing psychological resilience (Ursu & Măirean, 2022). Han et al. (2023) found that cognitive reappraisal and psychological resilience independently influence psychological well-being and mediate the relationship between coping styles and mental health through a chain mediation mechanism. Furthermore, Zhu and Li (2024) confirmed that physical activity positively impacts children's subjective well-being through cognitive reappraisal and psychological resilience, supporting the chain-mediated model.

Building on these findings, hypothesis H4 is proposed: Cognitive reappraisal and psychological resilience jointly mediate the relationship between physical activity and social adjustment.

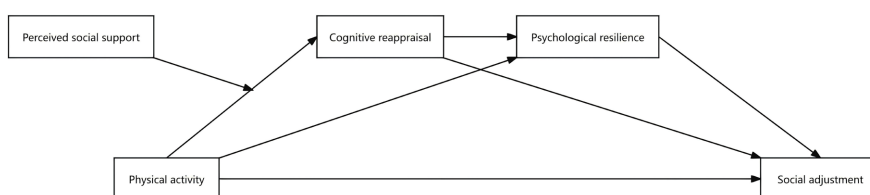
Perceived social support (PSS) is a key factor in understanding physical activity behavior. It plays an important role in encouraging individuals to participate in such activities (Baumeister & Leary, 1995). Social Support Theory (SST) highlights how social support influences behavior. Emotional support from family and friends, along with a supportive cultural environment, can boost self-confidence and motivate physical activity. Similarly, Self-Determination Theory (SDT) explains that behavior is driven by the satisfaction of basic psychological needs, such as autonomy, competence, and relationships. Meeting these needs increases intrinsic motivation, which encourages physical activity. Together, SST and SDT offer a strong framework for exploring how perceived social support impacts physical activity behavior. Dadvand et al. (2015) found a link between outdoor physical activity and general health, with this connection partly influenced by psychological state, perceived social support, and physical activity. This highlights the

role of social support in encouraging healthy behaviors and deepens our understanding of how the environment affects health. Similarly, [Sarı and Bayazıt \(2017\)](#) studied wrestlers and discovered that coaching behaviors and social support significantly boosted self-efficacy and motivation, reinforcing the positive effects of social support on physical activity. [Sheikh et al. \(2022\)](#) examined adolescents and found that peer social support improved their physical self-efficacy and participation in sports. For college freshmen, perceived social support plays a critical role in shaping their cognitive reappraisal abilities ([Sachs-Ericsson et al., 2021](#)). It enhances their self-esteem and confidence, helping them maintain a positive outlook when facing challenges ([Li et al., 2020](#); [Luan et al., 2023](#)). Moreover, perceived social support helps freshmen understand and manage stress, which leads to better mental health and adaptation ([Wu et al., 2021](#); [Kang et al., 2020](#)).

Thus, hypothesis H5 is proposed: Perceived social support moderates the relationship between physical activity and cognitive reappraisal. It also influences the mediating pathway in the chain of “Physical Activity → Cognitive Reappraisal → psychological resilience → Social Adjustment.” The total hypotheses proposed in this study are shown in [Table 1](#). In summary, this study introduces a hypothetical model ([Figure 1](#)) and tests the hypotheses through empirical research. The goal is to offer fresh insights into enhancing the social adjustment of college freshmen.

**Table 1.** Summary of the research hypothesis.

Hypothesis	Description
H1	Participation in sports activities positively influences the social adjustment skills of college freshmen.
H2	Cognitive reappraisal plays a mediating role between physical activity and social adjustment.
H3	Psychological resilience mediates the relationship between physical activity and social adjustment.
H4	Cognitive reappraisal and psychological resilience jointly mediate the relationship between physical activity and social adjustment.
H5	Perceived social support moderates the relationship between physical activity and cognitive reappraisal and influences the mediating pathway in the chain of “Physical Activity → Cognitive Reappraisal → Psychological Resilience → Social Adjustment”.



**Figure 1.** Theoretical model.

## 2. Research Methodology

### 2.1. Participants

A total of 1,203 questionnaires were collected from freshmen in Zhejiang Province

through an online survey. After excluding responses from individuals with psychological, neurological, or physiological conditions, as well as incomplete or inattentive answers, 1,061 valid questionnaires were retained, resulting in a validity rate of 88%. Among the participants, 545 were male and 471 were female. The age range was 17 to 19 years, with a mean age of 17.9. All participants provided informed consent before the study commenced.

## 2.2. Tools

### 2.2.1. Physical Activity Rating Scale

The Physical Activity Rating Scale (PARS), developed by Koyo Hashimoto (Xia et al., 2018), was used to assess physical activity based on frequency, intensity, and duration. PARS offers a detailed evaluation of activity levels, making it a useful tool for research and health monitoring. The participation level was calculated using the formula: intensity  $\times$  (duration - 1)  $\times$  frequency. Scores ranged from 0 to 100 and were divided into three categories: low (19 points or less), medium (20 -42 points), and high (43 points or more). The Cronbach's alpha coefficient for the scale in this study was 0.86, indicating good reliability. The validation factor analysis also confirmed a strong model fit, with  $\chi^2/df = 2.408$ , NFI = 0.931, CFI = 0.951, TLI = 0.912, SRMR = 0.035, and RMSEA = 0.035.

### 2.2.2. Cognitive Reassessment Questionnaire

The Emotion Regulation Questionnaire (ERQ), developed by Gross & John (2012), measures how individuals manage their emotions in both pre- and post-emotional states. It includes two dimensions: cognitive reappraisal and expressive suppression. The questionnaire contains 10 items, with six focused on cognitive reappraisal. An example item is, "I control my emotions by changing how I think about situations." Responses are rated on a five-point Likert scale, where 1 represents "completely disagree" and 5 represents "completely agree." Higher scores indicate more frequent use of emotion regulation strategies. In this study, the Cronbach's alpha was 0.89, indicating good reliability. The factor analysis confirmed a strong model fit with indices:  $\chi^2/df = 2.304$ , NFI = 0.941, RFI = 0.943, IFI = 0.952, CFI = 0.947, SRMR = 0.025, and RMSEA = 0.031.

### 2.2.3. Resilient Trait Scale for Chinese Adults

Liang & Chen (2012) developed a scale to measure psychological resilience based on its dimensional definition, encompassing five dimensions: support, optimism, internal control, coping, and acceptance. The scale consists of 30 items and defines psychological resilience as "a trait, intrinsic in nature, representing the quality of returning to normality." Responses are rated on a five-point Likert scale, where 1 represents a high degree of non-conformity, and 5 represents a high degree of conformity. Higher scores reflect greater psychological resilience. In this study, the scale demonstrated strong reliability with a Cronbach's alpha of 0.91. The factor analysis showed good model fit with indices:  $\chi^2/df = 2.604$ , NFI = 0.932, IFI = 0.956, CFI = 0.914, SRMR = 0.022, and RMSEA = 0.031.

#### 2.2.4. Social Adjustment Scale

The 14-item Screener version of the Rzepa & Weissman (2023) Social Adjustment Scale (SAS-SR: Screener) was designed to quickly evaluate an individual's social functioning. It includes six core dimensions that measure instrumental and expressive role functioning over the past two weeks. These dimensions are work, social and leisure activities, extended family relationships, spouse/partner role, parent/partner role, and overall social functioning. The scale uses a five-point Likert scale to enable rapid assessment. In this study, the scale showed good reliability with a Cronbach's alpha of 0.82. The model fit was supported by the following indices:  $\chi^2/df = 2.302$ , RMR = 0.0401, CFI = 0.927, NFI = 0.938, SRMR = 0.022, and RMSEA = 0.026.

#### 2.2.5. Perceived Social Support Scale

The Perceived Social Support Scale (PSSS) is a 12-item self-report tool that evaluates perceptions of support from friends, family, and significant others. Participants rate each item on a seven-point Likert scale, where 1 signifies strong disagreement, and 7 signifies strong agreement (Zimet et al., 1988). This study utilized a modified Chinese version of the PSSS, validated by Wang (Wang et al., 1999), which has been widely applied in research on perceived social support (Wen et al., 2020; Zhao et al., 2022). The scale demonstrated strong reliability with a Cronbach's alpha of 0.88. Additionally, the fit indices  $\chi^2/df = 2.206$ , RMR = 0.0408, CFI = 0.934, NFI = 0.951, SRMR = 0.023, and RMSEA = 0.024 confirmed its validity.

#### 2.2.6. Data Processing

SPSS 26.0 was used for descriptive statistics, correlation analysis, and regression analysis. Additionally, the percentile bootstrap method with bias correction, available in the PROCESS plug-in for SPSS, was employed to validate the moderated mediation model in this study.

### 3. Results

#### 3.1. Common Method Bias Test

Common method bias (CMB) is a critical concern in empirical research, as it can distort the relationships between variables and compromise the accuracy of findings. To mitigate CMB, this study employed measures such as anonymity, reverse-scored questions, and privacy protection. The Harman one-factor test was used to assess CMB, revealing that the first common factor accounted for 23.94% of the variance, which is below the 40% threshold. This indicates that CMB is not a significant issue in this study.

#### 3.2. Descriptive Statistics and Correlation Analysis

The Pearson correlation analysis revealed significant positive relationships among physical activity, cognitive reappraisal, social adjustment, and perceived social support. These findings supported proceeding with further analysis, as shown in **Table 2**.

**Table 2.** Descriptive statistics and correlation analysis of variables (N = 1061).

Variables	M ± SD	1	2	3	4
Physical activity	53.59 ± 27.67	1			
Cognitive reappraisal	28.55 ± 7.53	0.52**	1		
Psychological resilience	109.43 ± 16.75	0.48**	0.56**	1	
Social adjustment	47.88 ± 11.51	0.58**	0.53**	0.59**	1
Perceived social support	65.66 ± 12.73	0.50**	0.48**	0.53**	0.57**

Note: \*\* $p < 0.01$ .

### 3.3. Chain Mediation Model Test

In this study, we used Model 6 of the Process plug-in in SPSS to build a mediation model. Age, gender, and place of birth were included as control variables. The Bootstrap method was run 5,000 times with a 95% confidence interval. Since the confidence interval did not include zero, the mediation effect was confirmed as significant. Detailed results are shown in **Table 3**.

The results of Model 1 showed a significant positive link between physical activity and cognitive reappraisal ( $\beta = 0.47, t = 17.35, p < 0.001$ ). Model 2 revealed significant positive correlations between psychological resilience and cognitive reappraisal ( $\beta = 0.41, t = 13.63, p < 0.001$ ) and between physical activity and psychological resilience ( $\beta = 0.25, t = 8.53, p < 0.001$ ). Model 3 indicated significant positive relationships between physical activity and social adjustment ( $\beta = 0.21, t = 9.04, p < 0.001$ ), cognitive reappraisal and social adjustment ( $\beta = 0.47, t = 18.76, p < 0.001$ ), and psychological resilience and social adjustment ( $\beta = 0.20, t = 8.04, p < 0.001$ ).

A bias-corrected bootstrap method was used to evaluate the mediating effects, as shown in **Table 4**. The analysis revealed that cognitive reappraisal significantly mediated the impact of physical activity on social adjustment, with a mediation effect of 0.22 (95% CI [0.18, 0.27]). Psychological resilience also significantly mediated this relationship, with a mediation effect of 0.05 (95% CI [0.03, 0.07]). Additionally, both cognitive reappraisal and psychological resilience jointly mediated the effect of physical activity on social adjustment, with a mediation effect of 0.04 (95% CI [0.03, 0.05]). Based on these findings, a chain mediation model was developed, and its path diagram is illustrated in **Figure 2**.

**Table 3.** Mediating effects test.

	Model 1 Cognitive Reassessment				Model 2 Psychological Resilience				Model 3 Social Adjustment			
	$\beta$	se	$t$	95% CI	$\beta$	se	$t$	95% CI	$\beta$	se	$t$	95% CI
Gender	0.39	0.06	7.05*	[0.28, 0.49]	0.14	0.05	2.54*	[0.52, 4.07]	0.19	0.04	4.72*	[0.12, 0.28]
Age	-0.27	0.11	-2.66*	[-0.47, -0.07]	-0.08	0.09	-0.8	[-0.27, 0.11]	-0.17	0.08	-2.30*	[-0.32, -0.03]
Location	-0.09	0.03	-2.87**	[-0.16, -0.03]	0.02	0.03	0.4	[-0.05, 0.08]	-0.06	0.02	-2.31*	[-0.11, -0.01]
Sports activity	0.47	0.03	17.35***	[0.42, 0.52]	0.25	0.03	8.53***	[0.19, 0.31]	0.21	0.02	9.04***	[0.17, 0.26]
Cognitive reappraisal					0.41	0.03	13.63***	[0.35, 0.47]	0.47	0.03	18.76***	[0.42, 0.52]
Psychological resilience									0.20	0.02	8.04***	[0.15, 0.24]

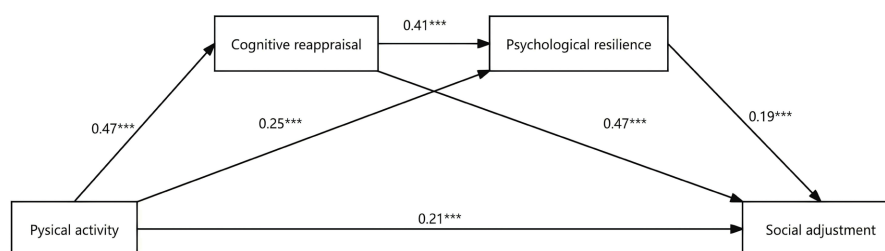
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R <sup>2</sup>	0.31	0.37	0.63
F	114.63***	118.74***	280.59***

Note: \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

**Table 4.** Estimates of path effect value intervals.

Trails	Efficiency value	Effect size	95% Confidence interval
Total effect	0.52	100%	[0.47, 0.57]
Direct effect			
Physical exercise → social adjustment	0.21	40%	[0.17, 0.26]
Indirect effect			
Pathway 1: Physical Activity → Cognitive Reassessment → Social Adjustment	0.22	42%	[0.18, 0.27]
Pathway 2: Physical Activity → Psychological Resilience → Social Adjustment	0.05	10%	[0.03, 0.07]
Pathway 3: Physical Exercise → Cognitive Reassessment → Psychological Resilience → Social Adjustment	0.04	8%	[0.03, 0.05]
Total indirect effect	0.31	60%	[0.26, 0.36]



Note: \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

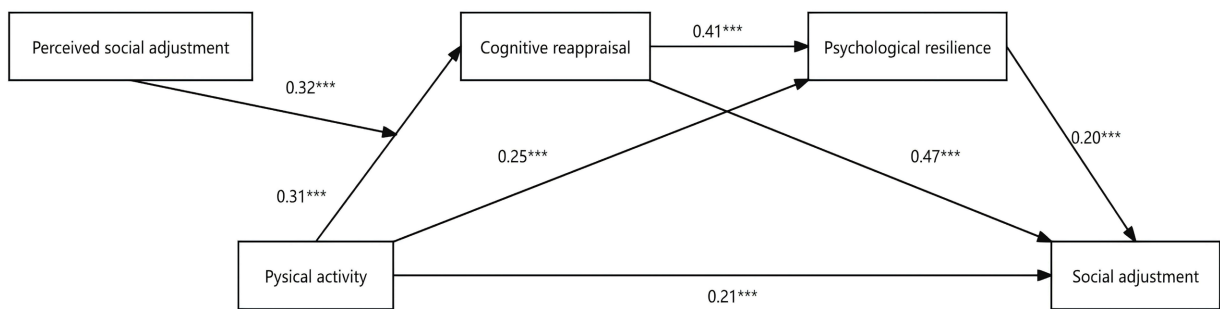
**Figure 2.** Chain mediation model of the effect of physical activity on social adjustment.

### 3.4. Tests of the Moderating Effect of Perceived Social Support

The moderating role of “perceived social support” was analyzed using Model 83 in Process, with gender, age, and birthplace as control variables. As shown in **Table 5**, Model 1 identified a significant positive correlation between physical activity and cognitive reappraisal ( $\beta = 0.08$ ,  $t = 10.29$ ,  $p < 0.001$ ), as well as between cognitive reappraisal and perceived social support ( $\beta = 0.32$ ,  $t = 10.56$ ,  $p < 0.001$ ). The interaction term of physical activity and perceived social support also showed a significant positive correlation with cognitive reappraisal ( $\beta = 0.06$ ,  $t = 2.72$ ,  $p < 0.01$ ), suggesting that perceived social support positively moderates the relationship between physical activity and cognitive reappraisal, thereby improving social adjustment. In Model 2, physical activity was significantly positively correlated with psychological resilience ( $\beta = 0.28$ ,  $t = 8.53$ ,  $p < 0.001$ ), and cognitive reappraisal showed a significant positive correlation with psychological resilience ( $\beta = 0.41$ ,  $t = 13.63$ ,  $p < 0.001$ ). Model 3 revealed significant positive associations

between physical activity and social adjustment ( $\beta = 0.21, t = 9.04, p < 0.001$ ), cognitive reappraisal and social adjustment ( $\beta = 0.47, t = 18.76, p < 0.001$ ), and psychological resilience and social adjustment ( $\beta = 0.20, t = 8.04, p < 0.001$ ). The moderated chain mediation model is depicted in **Figure 3**.

To explore the impact of physical activity on social adjustment under varying levels of perceived social support, the moderation variable was divided into three levels. As shown in **Table 6**, the moderating effect at low perceived social support was 0.19 (95% CI [0.07, 0.13]), at medium perceived social support was 0.25 (95% CI [0.16, 0.36]), and at high perceived social support was 0.30 (95% CI [0.18, 0.43]). These results suggest that college freshmen with greater perceived social support show better social adjustment, highlighting the positive role of perceived social support in enhancing the effects of physical activity.



Note: \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

**Figure 3.** Path effect model.

**Table 5.** Tests for chained mediation effects with moderation.

	Model 1 Cognitive Reassessment				Model 2 Psychological Resilience				Model 3 Social Adjustment			
	$\beta$	se	t	95% CI	$\beta$	se	t	95% CI	$\beta$	se	t	95% CI
Gender	0.36	0.05	6.63*	[0.25, 0.46]	0.14	0.05	2.54*	[0.03, 0.24]	0.20	0.04	4.72*	[0.12, 0.28]
Age	-0.19	0.09	-1.95	[-0.38, 0.01]	-0.08	0.10	-0.80	[-0.27, 0.11]	-0.18	0.08	-2.30*	[-0.32, -0.03]
Location	-0.06	0.03	-1.73	[-0.12, 0.05]	0.01	0.03	0.40	[-0.05, 0.08]	-0.06	0.02	-2.31*	[-0.11, -0.01]
Sports activity	0.08	0.01	10.29***	[0.68, 0.01]	0.25	0.03	8.53***	[0.19, 0.31]	0.21	0.02	9.04***	[0.17, 0.26]
Cognitive reappraisal					0.41	0.03	13.63***	[0.35, 0.47]	0.47	0.03	18.76***	[0.42, 0.52]
Psychological resilience									0.20	0.02	8.04***	[0.15, 0.24]
Perceived social support	0.32	0.03	10.56***	[0.26, 0.38]								
Perceived social support × Physical activity	0.06	0.02	2.72**	[0.02, 0.10]								
R <sup>2</sup>			0.38				0.37				0.63	
F			103.29***				118.74***				280.59***	

Note: \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

**Table 6.** Moderating effects test.

	Effect	BootLLCI	BootULCI
Moderating index	0.18	0.07	0.13
Low perceived social support	0.19	0.10	0.31
Perceived social support in	0.25	0.16	0.36
High perceived social support	0.30	0.18	0.43

## 4. Discussion

### 4.1. Discussion and Analysis Related to Physical Activity, Cognitive Reassessment, Psychological Resilience, and Social Adjustment

The study found a significant positive relationship between physical activity behavior and social adjustment among college freshmen, confirming hypothesis H1. Evidence strongly supports that physical activity benefits both physical and mental health (Grasdalsmoen et al., 2020). Physical activity helps relieve stress, reduce anxiety, and boost self-confidence and self-esteem (Arida & Teixeira, 2021; Kandola & Stubbs, 2020; Sulu et al., 2023). These psychological improvements enable individuals to stay calm and think clearly when facing social pressures and challenges, ultimately aiding in better adaptation to their social environment (MacLeod et al., 2023).

The findings confirm that cognitive reappraisal mediates the relationship between physical activity and social adjustment among college freshmen, validating hypothesis H2. Physical activity requires individuals to maintain focus and concentration, which enhances cognitive abilities like information processing and decision-making (Lee et al., 2022). Regular engagement in physical exercise allows individuals to refine and optimize these cognitive functions, enabling quicker and more effective responses to social situations (Niven et al., 2021). Additionally, physical activity stimulates neural growth and connectivity, increasing brain plasticity and adaptability (Vouglanis et al., 2022). This neuroplasticity supports the ability to reassess situations and modify thoughts and behaviors through cognitive reappraisal, facilitating better adjustment to social challenges.

The study demonstrates that psychological resilience mediates the relationship between physical activity and social adjustment among college freshmen, confirming hypothesis H3. The challenges associated with physical activity help build willpower and perseverance, which are essential components of psychological resilience and enable individuals to withstand setbacks (Bernecker & Kramer, 2020). This resilience fosters emotional stability, a key factor in navigating social adjustment (Chen et al., 2022). Additionally, the stress and challenges encountered during physical exercise enhance the ability to remain calm and composed under pressure. This stress-management capability, integral to psychological resilience, supports individuals in maintaining a balanced psychological state, aiding their adjustment to social environments (Poulus et al., 2020).

The findings confirm that cognitive reappraisal and psychological resilience jointly mediate the relationship between physical activity and social adjustment,

supporting hypothesis H4. Physical activity enhances cognitive functioning and self-efficacy, enabling quicker reactions and better decision-making in social contexts (Peers et al., 2020; Sanders et al., 2020). Improved cognitive capacity allows individuals to reassess situations and adjust their thought patterns and behaviors through cognitive reappraisal (Gao et al., 2024). Cognitive reappraisal helps individuals address social pressures constructively, thereby fostering psychological resilience. Increased resilience equips individuals to maintain emotional stability and adopt effective coping strategies when facing challenges (Gucciardi et al., 2021). Psychologically resilient individuals adapt and recover more effectively in response to social changes, enhancing their ability to navigate and thrive in social environments (Denovan et al., 2023).

In conclusion, physical activity improves social adjustment by enhancing cognitive reappraisal and psychological resilience. These effects can be understood within a chain mechanism whereby engagement in physical activity facilitates cognitive reappraisal and psychological resilience, in turn, social adjustment. This process highlights the positive effect of physical activity on social adjustment, providing a theoretical basis for further research and practice.

#### **4.2. Analysis of the Moderating Role of Perceived Social Support in the Relationship between Physical Activity and Social Adjustment**

The results of this study indicate that college freshmen's "perceived social support" plays a key role in mediating the chain of "physical activity-cognitive reappraisal-mental resilience-social adjustment." Therefore, Hypothesis H5 is supported.

College freshmen who feel supported by family, friends, and school are more likely to engage in physical activity. This support boosts their motivation and commitment to exercise (Ahmed et al., 2020). Social support in sports also provides freshmen with resources and opportunities, such as access to sports facilities, exercise partners, and coaching, further encouraging their participation (Buszard et al., 2020). Physical activity not only improves physical health but also benefits brain function, which in turn enhances cognitive reappraisal (Dominguez et al., 2021). This helps freshmen reassess situations and adjust their mindset and behaviors when facing stress and challenges (Drigas, Mitsea, & Skianis, 2022). Cognitive reappraisal enables individuals to stay calm and rational in adversity while also fostering mental resilience. Successfully coping with challenges through reappraisal, such as reframing a stressful event as an opportunity for growth or viewing a setback as a learning experience, can significantly boost self-confidence. (Schnaubert et al., 2021). Psychologically resilient individuals are better able to maintain composure under stress, improving their coping abilities. This enhanced coping capacity increases their confidence and comfort in social situations (Goldstein et al., 2020).

In conclusion, perceived social support helps college freshmen cope with academic and life challenges, improving their social adjustment by providing emotional

support, promoting skill development, and strengthening their sense of social integration.

## 5. Summary

This study used a questionnaire survey to examine the physical activity, cognitive reappraisal, psychological resilience, social adjustment, and perceived social support of college freshmen. It then explored the relationships between these five variables and reached the following conclusions: 1) College freshmen's physical activity, cognitive reappraisal, and psychological resilience are positively linked to social adjustment. 2) Cognitive reappraisal and psychological resilience serve as chain mediators in the relationship between physical activity and social adjustment. 3) Perceived social support positively moderates the pathway of "physical activity-cognitive reappraisal-psychological resilience-social adjustment."

Theoretically, this study contributes to the framework of social adjustment theory by proposing a chain mediation model linking physical exercise, cognitive reappraisal, psychological resilience, and social adjustment. It highlights the crucial role of physical activity in supporting social adjustment among college freshmen, while also revealing how cognitive reappraisal and psychological resilience mediate this process. This model provides new insights into the mechanisms of individual adjustment in response to social and environmental challenges. By exploring the moderating effect of perceived social support, the study enhances our understanding of the importance of social support in mental health and behavioral regulation, offering a theoretical foundation for future research in related areas.

The findings of this study provide practical guidance for implementing physical education and mental health programs in colleges and universities. Colleges are encouraged to organize more physical activities for freshmen, as these activities positively influence their social adjustment. Such programs can enhance students' physical fitness and mental resilience. For example, universities can offer diverse and inclusive sports programs that cater to different skill levels and interests, fostering a culture of lifelong physical activity and wellness. The study also highlights that perceived social support influences the connection between physical activity and social adjustment. Therefore, colleges, in collaboration with families, should focus on providing emotional support and necessary resources to help students overcome adjustment challenges. This can be done by introducing platforms like peer mentoring programs, support groups, and wellness workshops that emphasize the importance of social connections and a sense of belonging. To further support freshmen, colleges can strengthen their cognitive reappraisal abilities and mental resilience. This can improve social adjustment and overall well-being. Practical initiatives include integrating mindfulness and stress management techniques into the curriculum, offering targeted counseling services, and developing resilience training programs to help students cope with challenges. Additionally, universities can use these findings to advocate for policy changes that prioritize physical education and mental health resources. This may include allocating more

funds for sports facilities, hiring more mental health professionals, and creating interdisciplinary programs that combine physical education with psychological wellness initiatives.

This study has several limitations. First, the sample was limited to college freshmen in Zhejiang Province, China, which may restrict the generalizability of the findings to other cultural and regional contexts. Differences in culture and regional disparities within China can significantly affect social adjustment and participation in physical activity. Future research could explore these variations further to better understand how physical activity impacts social adjustment across diverse cultural and regional settings. Second, it used a cross-sectional design, which did not allow for examining the dynamic relationship between variables over time. It was not possible to determine whether college freshmen's social adjustment changes as their grades improve and physical activity levels continue. Future studies could use a longitudinal design to track the social adjustment and physical activity behaviors of the same group of students over time, providing a clearer understanding of this developmental process. Third, while this study explored the moderating effect of perceived social support, it did not fully analyze the specific sources and forms of support (e.g., family, peers, teachers). Future research could investigate how different types of social support influence the relationship between physical activity and mental health, and develop more targeted interventions to enhance these supports.

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### **Conflicts of Interest**

The author declares no conflicts of interest regarding the publication of this paper.

### **References**

- Ahmed, M. D., Ho, W. K. Y., Van Niekerk, R. L., Sulz, L., & Begum, S. (2020). Social Support and Sports Participation Motivations of Female Adolescents in India: Study of Age Transition and Achievement Level. *Physical Culture and Sport: Studies and Research*, *88*, 49-67.
- Arida, R. M., & Teixeira-Machado, L. (2021). The Contribution of Physical Exercise to Brain Resilience. *Frontiers in Behavioral Neuroscience*, *14*, Article 626769. <https://doi.org/10.3389/fnbeh.2020.626769>
- Baumeister, R. F., & Leary, M. R. (1995). The Need to Belong: Desire for Interpersonal Attachments as a Fundamental Human Motivation. *Psychological Bulletin*, *117*, 497-529. <https://doi.org/10.1037/0033-2909.117.3.497>
- Bernecker, K., & Kramer, J. (2020). Implicit Theories about Willpower Are Associated with Exercise Levels during the Academic Examination Period. *Sport, Exercise, and Performance Psychology*, *9*, 216-231. <https://doi.org/10.1037/spy0000182>
- Bryan, C., O'Shea, D., & MacIntyre, T. (2019). Stressing the Relevance of Resilience: A Systematic Review of Resilience across the Domains of Sport and Work. *International*

- Review of Sport and Exercise Psychology*, 12, 70-111.  
<https://doi.org/10.1080/1750984x.2017.1381140>
- Buszard, T., Garofolini, A., Reid, M., Farrow, D., Oppici, L., & Whiteside, D. (2020). Scaling Sports Equipment for Children Promotes Functional Movement Variability. *Scientific Reports*, 10, Article No. 3111. <https://doi.org/10.1038/s41598-020-59475-5>
- Castro, S. A., Sasser, J., Sills, J., & Doane, L. D. (2024). Reciprocal Associations of Perceived Discrimination, Internalizing Symptoms, and Academic Achievement in Latino Students across the College Transition. *Cultural Diversity & Ethnic Minority Psychology*, 30, 72-82. <https://doi.org/10.1037/cdp0000528>
- Chen, H., Wang, C., Lu, T., Tao, B., Gao, Y., & Yan, J. (2022). The Relationship between Physical Activity and College Students' Mobile Phone Addiction: The Chain-Based Mediating Role of Psychological Capital and Social Adaptation. *International Journal of Environmental Research and Public Health*, 19, Article 9286. <https://doi.org/10.3390/ijerph19159286>
- Chrétien, A., Hayotte, M., Mériaux, S., Baize, D., Vuillemin, A., & d'Arripe-Longueville, F. (2024). Development and Preliminary Validation of the Resilience Qualities in Sport (RESIST) Scale. *International Journal of Sport and Exercise Psychology*. <https://doi.org/10.1080/1612197x.2024.2341391>
- Dadvand, P., Bartoll, X., Basagaña, X., Dalmau-Bueno, A., Martinez, D., Ambros, A. et al. (2015). Green Spaces and General Health: Roles of Mental Health Status, Social Support, and Physical Activity. *Environment International*, 91, 161-167. <https://doi.org/10.1016/j.envint.2016.02.029>
- Dalimunthe, D. E., & Nasution, F. (2023). The Role of Cognitive Reappraisal and Expressive Suppression toward Self-Adjustment among Adolescence. *Journal of Educational, Health and Community Psychology*, 1, 403-414. <https://doi.org/10.12928/jehcp.v1i2.26130>
- Denovan, A., Dagnall, N., & Drinkwater, K. (2023). Examining What Mental Toughness, Ego Resiliency, Self-Efficacy, and Grit Measure: An Exploratory Structural Equation Modelling Bifactor Approach. *Current Psychology*, 42, 22148-22163. <https://doi.org/10.1007/s12144-022-03314-5>
- Dominguez, L. J., Veronese, N., Vernuccio, L., Catanese, G., Inzerillo, F., Salemi, G. et al. (2021). Nutrition, Physical Activity, and Other Lifestyle Factors in the Prevention of Cognitive Decline and Dementia. *Nutrients*, 13, Article 4080. <https://doi.org/10.3390/nu13114080>
- Drigas, A., Mitsea, E., & Skianis, C. (2022). Subliminal Training Techniques for Cognitive, Emotional and Behavioural Balance. the Role of Emerging Technologies. *Technium Social Sciences Journal*, 33, 164-186. <https://doi.org/10.47577/tssj.v33i1.6881>
- Dryman, M. T., & Heimberg, R. G. (2018). Emotion Regulation in Social Anxiety and Depression: A Systematic Review of Expressive Suppression and Cognitive Reappraisal. *Clinical Psychology Review*, 65, 17-42. <https://doi.org/10.1016/j.cpr.2018.07.004>
- Eime, R. M., Young, J. A., Harvey, J. T., Charity, M. J., & Payne, W. R. (2013). A Systematic Review of the Psychological and Social Benefits of Participation in Sport for Children and Adolescents: Informing Development of a Conceptual Model of Health through Sport. *International Journal of Behavioral Nutrition and Physical Activity*, 10, Article No. 98. <https://doi.org/10.1186/1479-5868-10-98>
- Falavarjani, M. F., & Yeh, C. J. (2019). Optimism and Distress Tolerance in the Social Adjustment of Nurses: Examining Resilience as a Mediator and Gender as a Moderator. *Journal of Research in Nursing*, 24, 500-512. <https://doi.org/10.1177/1744987119839102>
- Gao, W., Yan, X., Chen, Y., Yang, J., & Yuan, J. (2024). Situation Covariation and Goal

- Adaptiveness? the Promoting Effect of Cognitive Flexibility on Emotion Regulation in Depression. *Emotion*. <https://doi.org/10.1037/emo0001410>
- Goldstein, S. E., Lee, C. Y. S., Dik, B. J., & Rodas, J. M. (2020). Sources of Social Support and Gender in Perceived Stress and Individual Adjustment among Latina/O College-Attending Emerging Adults. *Cultural Diversity & Ethnic Minority Psychology, 26*, 134-147. <https://doi.org/10.1037/cdp0000279>
- Grasdalsmoen, M., Eriksen, H. R., Lønning, K. J., & Sivertsen, B. (2020). Physical Exercise, Mental Health Problems, and Suicide Attempts in University Students. *BMC Psychiatry, 20*, Article No. 175. <https://doi.org/10.1186/s12888-020-02583-3>
- Gross, J. J. (1998). Antecedent- and Response-Focused Emotion Regulation: Divergent Consequences for Experience, Expression, and Physiology. *Journal of Personality and Social Psychology, 74*, 224-237. <https://doi.org/10.1037/0022-3514.74.1.224>
- Gross, J. J., & John, O. P. (2012). Emotion Regulation Questionnaire. *Journal of Personality and Social Psychology, 46*, 780-784.
- Gucciardi, D. F., Lines, R. L. J., Ducker, K. J., Peeling, P., Chapman, M. T., & Temby, P. (2021). Mental Toughness as a Psychological Determinant of Behavioral Perseverance in Special Forces Selection. *Sport, Exercise, and Performance Psychology, 10*, 164-175. <https://doi.org/10.1037/spy0000208>
- Han, F., Duan, R., Huang, B., & Wang, Q. (2023). Psychological Resilience and Cognitive Reappraisal Mediate the Effects of Coping Style on the Mental Health of Children. *Frontiers in Psychology, 14*, Article 1110642. <https://doi.org/10.3389/fpsyg.2023.1110642>
- Haoran, S., Tianci, L., Hanwen, C., Baole, T., Yiran, C., & Yan, J. (2023). The Impact of Basketball on the Social Adjustment of Chinese Middle School Students: The Chain Mediating Role of Interpersonal Relationships and Self-identity. *Frontiers in Psychology, 14*, Article 1205760. <https://doi.org/10.3389/fpsyg.2023.1205760>
- Hobfoll, S. E. (2002). Social and Psychological Resources and Adaptation. *Review of General Psychology, 6*, 307-324. <https://doi.org/10.1037/1089-2680.6.4.307>
- Jiang, Y., Qiao, T., Zhang, Y., Wu, Y., & Gong, Y. (2023). Social Support and Vicarious Posttraumatic Growth among Psychological Hotline Counselors during COVID-19: The Role of Resilience and Cognitive Reappraisal. *Health Psychology and Behavioral Medicine, 11*, Article ID: 2274550. <https://doi.org/10.1080/21642850.2023.2274550>
- Kandola, A., & Stubbs, B. (2020). Exercise and Anxiety. In J. Xiao (Ed.), *Physical Exercise for Human Health* (pp. 345-352). Springer Nature Singapore. [https://doi.org/10.1007/978-981-15-1792-1\\_23](https://doi.org/10.1007/978-981-15-1792-1_23)
- Kang, N. E., Kim, H. Y., Kim, J. Y., & Kim, S. R. (2020). Relationship between Cancer Stigma, Social Support, Coping Strategies and Psychosocial Adjustment among Breast Cancer Survivors. *Journal of Clinical Nursing, 29*, 4368-4378. <https://doi.org/10.1111/jocn.15475>
- Kim, J., & Tamminen, K. A. (2023). Emotion Regulation among Competitive Youth Athletes: Exploring the Independent and Interactive Effects of Cognitive Reappraisal and Expressive Suppression. *International Journal of Sport and Exercise Psychology, 21*, 534-556. <https://doi.org/10.1080/1612197x.2022.2064893>
- Koo, K., Baker, I., & Yoon, J. (2021). The First Year Acculturation: A Longitudinal Study on Acculturative Stress and Adjustment among the First Year International College Students. *Journal of International Students, 11*, 278-298. <https://doi.org/10.32674/jis.v11i2.1726>
- Lee, K., Bae, H., & Jang, S. (2022). Effect of Exercise Combined with Natural Stimulation on Korean College Students' Concentration and Positive Psychological Capital: A Pilot

- Study. *Healthcare*, 10, Article 673. <https://doi.org/10.3390/healthcare10040673>
- Li, B., Pan, Y., Liu, G., Chen, W., Lu, J., & Li, X. (2020). Perceived Social Support and Self-Esteem Mediate the Relationship between Childhood Maltreatment and Psychosocial Flourishing in Chinese Undergraduate Students. *Children and Youth Services Review*, 117, Article ID: 105303. <https://doi.org/10.1016/j.childyouth.2020.105303>
- Li, J., Wang, Y., Dou, K., & Shang, Y. (2022). On the Development of Meaning in Life among College Freshmen: Social Relationship Antecedents and Adjustment Consequences. *Journal of Happiness Studies*, 23, 1709-1735. <https://doi.org/10.1007/s10902-021-00470-6>
- Liang, B., & Chen, C. (2012). The Development of a Psychological Resilience Scale for Chinese Adults as a Mental Health Quality Assessment System. *Psychological and Behavioral Research*, 10, 269-277.
- Luan, L., Hong, J., Cao, M., Dong, Y., & Hou, X. (2023). Exploring the Role of Online EFL Learners' Perceived Social Support in Their Learning Engagement: A Structural Equation Model. *Interactive Learning Environments*, 31, 1703-1714. <https://doi.org/10.1080/10494820.2020.1855211>
- MacLeod, K. J., English, S., Ruuskanen, S. K., & Taborsky, B. (2023). Stress in the Social Context: A Behavioural and Eco-Evolutionary Perspective. *Journal of Experimental Biology*, 226, jeb245829. <https://doi.org/10.1242/jeb.245829>
- Mathunjwa-Dlamini, T. R., Malinga, N., Khumalo, P. P., Shongwe-Gwebu, S., Magagula, N., Mkhonta, N. R., & Mhlongo, Z. C. (2022). The Relationship between Social Adjustment and Depression among Students in One of the Tertiary Institutions in Eswatini. *UNESWA Journal of Education*, 5, 2.
- Morales-Rodríguez, F. M., Espigares-López, I., Brown, T., & Pérez-Mármol, J. M. (2020). The Relationship between Psychological Well-Being and Psychosocial Factors in University Students. *International Journal of Environmental Research and Public Health*, 17, Article 4778. <https://doi.org/10.3390/ijerph17134778>
- Morgan, P. B. C., Fletcher, D., & Sarkar, M. (2013). Defining and Characterizing Team Resilience in Elite Sport. *Psychology of Sport and Exercise*, 14, 549-559. <https://doi.org/10.1016/j.psychsport.2013.01.004>
- Mudhovozi, P. (2012). Social and Academic Adjustment of First-Year University Students. *Journal of Social Sciences*, 33, 251-259. <https://doi.org/10.1080/09718923.2012.11893103>
- Niven, A., Laird, Y., Saunders, D. H., & Phillips, S. M. (2021). A Systematic Review and Meta-Analysis of Affective Responses to Acute High Intensity Interval Exercise Compared with Continuous Moderate- and High-Intensity Exercise. *Health Psychology Review*, 15, 540-573. <https://doi.org/10.1080/17437199.2020.1728564>
- Owusu-Agyeman, Y., & Mugume, T. (2023). Academic Adjustment of First Year Students and Their Transition Experiences: The Moderating Effect of Social Adjustment. *Tertiary Education and Management*, 29, 189-209. <https://doi.org/10.1007/s11233-023-09120-3>
- Peers, C., Issartel, J., Behan, S., O'Connor, N., & Belton, S. (2020). Movement Competence: Association with Physical Self-Efficacy and Physical Activity. *Human Movement Science*, 70, Article ID: 102582. <https://doi.org/10.1016/j.humov.2020.102582>
- Pila, E., Stamiris, A., Castonguay, A., & Sabiston, C. M. (2014). Body-Related Envy: A Social Comparison Perspective in Sport and Exercise. *Journal of Sport and Exercise Psychology*, 36, 93-106. <https://doi.org/10.1123/jsep.2013-0100>
- Poulus, D., Coulter, T. J., Trotter, M. G., & Polman, R. (2020). Stress and Coping in Esports and the Influence of Mental Toughness. *Frontiers in Psychology*, 11, Article 628. <https://doi.org/10.3389/fpsyg.2020.00628>
- Rosa, A., Olaso-Gonzalez, G., Arc-Chagnaud, C., Millan, F., Salvador-Pascual, A., García-

- Lucerga, C. et al. (2020). Physical Exercise in the Prevention and Treatment of Alzheimer's Disease. *Journal of Sport and Health Science*, 9, 394-404. <https://doi.org/10.1016/j.jshs.2020.01.004>
- Rutter, M. (1990). Psychosocial Resilience and Protective Mechanisms. *American Journal of Orthopsychiatry*, 57, 316-331. <https://doi.org/10.1111/j.1939-0025.1987.tb03541.x>
- Rzepa, S. R., & Weissman, M. (2023). Social Adjustment Scale Self-Report (SAS-SR). In A. C. Michalos, (Ed.), *Encyclopedia of Quality of Life and Well-Being Research* (pp. 6017-6021). Springer Netherlands. [https://doi.org/10.1007/978-94-007-0753-5\\_2730](https://doi.org/10.1007/978-94-007-0753-5_2730)
- Sachs-Ericsson, N., Carr, D., Sheffler, J., Preston, T. J., Kiosses, D., & Hajcak, G. (2021). Cognitive Reappraisal and the Association between Depressive Symptoms and Perceived Social Support among Older Adults. *Aging & Mental Health*, 25, 453-461. <https://doi.org/10.1080/13607863.2019.1698516>
- Sahar, N., & Muzaffar, N. M. (2017). Role of Family System, Positive Emotions and Resilience in Social Adjustment among Pakistani Adolescents. *Journal of Educational, Health and Community Psychology*, 6, 46-58. <https://doi.org/10.12928/jehcp.v6i2.6944>
- Sanders, L. M. J., Hortobágyi, T., Karssemeijer, E. G. A., Van der Zee, E. A., Scherder, E. J. A., & van Heuvelen, M. J. G. (2020). Effects of Low- and High-Intensity Physical Exercise on Physical and Cognitive Function in Older Persons with Dementia: A Randomized Controlled Trial. *Alzheimer's Research & Therapy*, 12, Article No. 28. <https://doi.org/10.1186/s13195-020-00597-3>
- Sari, İ., & Bayazit, B. (2017). The Relationship between Perceived Coaching Behaviours, Motivation and Self-Efficacy in Wrestlers. *Journal of Human Kinetics*, 57, 239-251. <https://doi.org/10.1515/hukin-2017-0065>
- Sarkar, M., & Fletcher, D. (2014). Psychological Resilience in Sport Performers: A Review of Stressors and Protective Factors. *Journal of Sports Sciences*, 32, 1419-1434. <https://doi.org/10.1080/02640414.2014.901551>
- Schnaubert, L., Krukowski, S., & Bodemer, D. (2021). Assumptions and Confidence of Others: The Impact of Socio-Cognitive Information on Metacognitive Self-Regulation. *Metacognition and Learning*, 16, 855-887. <https://doi.org/10.1007/s11409-021-09269-5>
- Self, M. J., & Stowers, N. A. (2022). Examining Social Adjustment of College Student-Athletes. *International Journal of Research-Granthaalayah*, 10, 9-20. <https://doi.org/10.29121/granthaalayah.v10.i1.2022.4419>
- Serretti, A., Chiesa, A., Souery, D., Calati, R., Sentissi, O., Kasper, S. et al. (2013). Social Adjustment among Treatment Responder Patients with Mood Disorders. *Journal of Affective Disorders*, 150, 961-966. <https://doi.org/10.1016/j.jad.2013.05.021>
- Sheikh, M., Bay, N., Ghorbani, S., & Esfahaninia, A. (2022). Effects of Social Support and Physical Self-Efficacy on Physical Activity of Adolescents. *International Journal of Pediatrics*, 10, 15823-15834.
- Stover, A. D., Shulkin, J., Lac, A., & Rapp, T. (2024). A Meta-Analysis of Cognitive Reappraisal and Personal Resilience. *Clinical Psychology Review*, 110, Article ID: 102428. <https://doi.org/10.1016/j.cpr.2024.102428>
- Sulu, B., Kayğusuz, Ş., Sinici, E., & Hassani, F. (2023). The Effect of Psychological Well-Being on Self-Confidence in Exercise Participants. *Uluslararası Egzersiz Psikolojisi Dergisi*, 5, 1-8. <https://doi.org/10.51538/intjourexerpsyc.1243506>
- Troy, A. S., Wilhelm, F. H., Shallcross, A. J., & Mauss, I. B. (2010). Seeing the Silver Lining: Cognitive Reappraisal Ability Moderates the Relationship between Stress and Depressive Symptoms. *Emotion*, 10, 783-795. <https://doi.org/10.1037/a0020262>
- Ungar, M. (2011). The social construction of resilience. In J. Wright (Ed.), *International*

- Encyclopedia of Social & Behavioral Sciences* (pp. 14075-14080). Elsevier.  
<https://doi.org/10.1016/B0-08-043753-7/00152-8>
- Ursu, A., & Măirean, C. (2022). Cognitive Emotion Regulation Strategies as Mediators between Resilience and Stress during COVID-19 Pandemic. *International Journal of Environmental Research and Public Health*, *19*, Article 12631.  
<https://doi.org/10.3390/ijerph191912631>
- Vouglanis, T., Driga, A. M., & Drigas, A. (2022). Physical and Mental Exercise to Create New Congenial Neurons, to Increase Intelligence and the Role of ICTs. *Technium BioChemMed*, *3*, 21-36. <https://doi.org/10.47577/biochemmed.v3i3.7325>
- Wang, X. D., Wang, X. L., & Ma, H. (1999). *Rating Scales for Mental Health*. Chinese Mental Health Journal Press.
- Wen, X., Zhao, C. Y., Kishimoto, T., & Qian, M. Y. (2020). Effect of Perceived Social Support on the Efficacy of Online Cognitive Behavioral Therapy for Social Anxiety Disorder. *Acta Scientiae Naturalis Universitatis Pekinensis*, *56*, 571-578.  
<https://doi.org/10.13209/j.0479-8023.2020.025>
- Wu, F., Ren, Z., Wang, Q., He, M., Xiong, W., Ma, G. et al. (2021). The Relationship between Job Stress and Job Burnout: The Mediating Effects of Perceived Social Support and Job Satisfaction. *Psychology, Health & Medicine*, *26*, 204-211.  
<https://doi.org/10.1080/13548506.2020.1778750>
- Xia, X. W., Huang, J. L., & Liu, S. (2018). An Empirical Study on the Physical Exercise Behavior of Graduate Students. *Journal of East China Normal University*, *36*, 114-128.  
<https://doi.org/10.16382/j.cnki.1000-5560.2018.05.011>
- Xin, Z., Li, T., Li, Q., Chen, Y., & Wang, M. (2024). Coach-Athlete Attachment and Athlete Burnout: Testing Longitudinal Mediation via Cognitive Reappraisal and Expressive Suppression. *International Journal of Sport and Exercise Psychology*.  
<https://doi.org/10.1080/1612197x.2024.2389207>
- Yang, M., Wu, J., Wu, Y., & Li, X. (2024). RETRACTED: How Does Physical Activity Enhance the Subjective Well-Being of University Students? A Chain Mediation of Cognitive Reappraisal and Resilience. *Behavioral Sciences*, *14*, Article 164.  
<https://doi.org/10.3390/bs14030164>
- Zhang, R., Liu, F., Wang, X., & Wang, S. (2024). Towards Active Health: A Study on the Relationship between Physical Activity and Body Image among College Students. *Heliyon*, *10*, e38465. <https://doi.org/10.1016/j.heliyon.2024.e38465>
- Zhao, Y., Xing, X., Tian, T., Wang, Q., Liang, S., Wang, Z. et al. (2022). Post COVID-19 Mental Health Symptoms and Quality of Life among COVID-19 Frontline Clinicians: A Comparative Study Using Propensity Score Matching Approach. *Translational Psychiatry*, *12*, Article No. 376. <https://doi.org/10.1038/s41398-022-02089-4>
- Zhu, D., & Li, Y. (2024). Boosting Happiness in Left-Behind Children: Unveiling the Power of Physical Activity through Cognitive Reappraisal and Psychological Resilience. *PLOS ONE*, *19*, e0309291. <https://doi.org/10.1371/journal.pone.0309291>
- Zhu, J., Zhang, Z., Xu, P., Huang, K., & Li, Y. (2023). Unsociability and Social Adjustment of Chinese Preschool Migrant Children: The Moderating Role of Resilience. *Frontiers in Psychiatry*, *14*, Article 1074217. <https://doi.org/10.3389/fpsy.2023.1074217>
- Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The Multidimensional Scale of Perceived Social Support. *Journal of Personality Assessment*, *52*, 30-41.  
[https://doi.org/10.1207/s15327752jpa5201\\_2](https://doi.org/10.1207/s15327752jpa5201_2)