

## The Effect of Coaching Style on Performance of Athletes Through Anxiety as Mediating Variable in Adolescent Swimmers

### El efecto del estilo de entrenamiento sobre el rendimiento de los deportistas a través de la ansiedad como variable mediadora en nadadores adolescents

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**Abstract.** This study aimed to analyze the effect of the relationship between coach leadership style and the performance achievement of adolescent swimmers through anxiety as a mediator. This study was conducted on 100 adolescent swimmers in the Special Region of Yogyakarta Province who have won at least at the regional level. This type of research was descriptive correlation using the Structural Equation Modeling (SEM) approach with Smart-PLS. The results of this research are the validity test on outer loading ( $>0.7$ ) and the constructed value on the Fornell-Larcker Criterion is greater than the other construct values ( $>0.7$ ) and the Cronbach's alpha reliability value ( $>0.7$ ) means that this instrument is suitable for use for research. The results of the fit model are SRMR or Standardized Root Mean Square value, the value is  $0.066 < 0.10$  or  $0.077 < 0.08$  so the model fits the data. Hypothesis results from 1) coaching style and the performance of swimming athletes are P-Values 0.001, 2) the relationship between coaching style and anxiety, P-Values 0.002, 3) the relationship between anxiety and the performance of swimming athletes, P-Values 0.000, 4) the relationship between coaching style and the performance of swimming athletes through anxiety P-Values 0.021. Therefore, four hypotheses can be accepted. In conclusion, differences in types of coaching styles, either directly or indirectly, will influence athletes' achievement orientation and performance.

**Keywords:** Coaching Style, Anxiety, Performance Achievement, Swimmer

**Resumen.** Este estudio tuvo como objetivo analizar el efecto de la relación entre el estilo de liderazgo del entrenador y el logro de rendimiento de nadadores adolescentes a través de la ansiedad como mediadora. Este estudio se realizó con 100 nadadores adolescentes de la Región Especial de la provincia de Yogyakarta que ganaron al menos a nivel regional. Este tipo de investigación fue de correlación descriptiva utilizando el enfoque de Modelado de Ecuaciones Estructurales (SEM) con Smart-PLS. Los resultados de esta investigación son la prueba de validez de la carga externa ( $>0.7$ ) y el valor de constructo del Criterio de Fornell-Larcker es mayor que los otros valores de constructo ( $>0.7$ ) y el valor de confiabilidad alfa de Cronbach ( $>0.7$ ) significa que este El instrumento es adecuado para su uso en investigación. Los resultados del modelo de ajuste son SRMR o valor cuadrático medio estandarizado, el valor es  $0.066 < 0.10$  o  $0.077 < 0,08$ , por lo que el modelo se ajusta a los datos. Los resultados de la hipótesis 1) el estilo de entrenamiento y el rendimiento de los nadadores son valores P 0.001, 2) la relación entre el estilo de entrenamiento y la ansiedad, valores P 0.002, 3) la relación entre la ansiedad y el rendimiento de los nadadores, valores P 0.000, 4) la relación entre el estilo de entrenamiento y el rendimiento de los nadadores a través de la ansiedad Valores P 0.021. Por tanto, se pueden aceptar cuatro hipótesis. En conclusión, las diferencias en los tipos de estilos de entrenamiento, ya sea directa o indirectamente, influirán en la orientación al logro y el rendimiento de los atletas

**Palabras clave:** Estilo de Entrenamiento, Ansiedad, Atletas de Rendimiento, Nadador

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## Introduction

Since it was included in the Athens Olympics in 1896, swimming has become one of the most well-liked sports in the world. Front crawl, breaststroke, backstroke, and butterfly are the four main style categories that make swimming a competitive sport (Martens et al., 2015). Performance sport in swimming requires strength, power, and body mass that must be increased physiologically (Vincent et al., 2023). Previous studies have highlighted that the upper body, lower limbs, and jump height are the most effective strength training for sprint events (Clemente-Suárez et al., 2021; Keiner et al., 2019; Lopes et al., 2021). Although physical training specifically determines good performance results, the combination of physiological and psychological aspects will produce the best sports performance results in young swimmers (Clemente-Suárez et al., 2021). Therefore, the critical factors that affect sports performance in swimming must be examined to provide extensive insight for improving their competitive sport. In certain situations,

failure in performing competitive sports can happen when athletes are experiencing mental problems which include pressure, depression, and anxiety (Hasanah & Refanthira, 2020). Due to the negative effects of mental problems on sports performance, competitive anxiety has received much attention from researchers (Akbar et al., 2024; Bukhari et al., 2021; Lee et al., 2022). Anxiety is a complicated condition when feeling a combination of physical, cognitive, and physiological symptoms. The different intensities of anxiety are determined by the type of sports competition. As motivators, sports coaches must be able to keep athletes motivated, whether they are winning or losing, to reduce anxiety levels during competition (both cognitive and somatic) (Fortes et al., 2016). The impact of the motivational process in Self-Determination Theory (SDT) can determine the quality of athletes' behavior and mental health (Shannon et al., 2019), (Cronin et al., 2022). Multidimensional anxiety theory states that competitive anxiety can occur at the somatic or cognitive level to behavioral outcomes. Somatic anxiety refers to bodily reactions such as changes in heart

and muscle functions, difficulty in breathing, excessive sweating, dizziness, and other health problems, whereas cognitive anxiety refers to athletes' ability to concentrate, receive information or instructions, remember things, make decisions, and cause confusion.

Coaches have a crucial role in shaping psychological experiences. The perception relationship between coach and athletes plays a significant role in determining the rate of sport participation. In competitive sports, the personality of coaches can impact athlete satisfaction (Ordonhes et al., 2021). Different coaching styles in sports are influenced by the personalities of coaches. Coaching is a practical effort to assist an individual or group in improving their performance according to their chosen sport. Each coach has a different coaching style or philosophy as an approach to supporting athletes to reach their optimal potential. Coaching style often reflects the way coaches behave and their desired management style (Mandan et al., 2024).

There are five evaluation scales based on the Multidimensional Model of Leadership study for five leadership dimensions: Democratic Behavior, Positive Feedback, Training and Instruction, Social Support, and Autocratic Behavior (Menegassi et al., 2021), (Gomes et al., 2021), (Lee & Nam, 2022). In swimming, the most common coaching styles used are democratic and autocratic coaching styles (Jiménez et al., 2019), (Labarda, 2022). A democratic coaching style has a more positive impact on the athlete's career when the coach is more cooperative (Sampaio & Teques, 2019). Coaches also show compassion, give advice, and actively participate during the training process. The democratic coaching style allows athletes to participate in decision-making, whereas the autocratic coaching style demonstrates the coach's higher authority (Labarda, 2022). Whereas the autocratic coaching style reflects authoritarian decision-making. Athletes need to follow the coaches' instructions and commands. Due to coaches having control over athletes, those who prefer a higher level of autonomy may feel a tense or strained relationship with the coach.

The facts revealed that many adolescent swimmers still find it challenging to communicate their psychological issues to their coach. Psychological problems in adolescence are mostly caused by genetic and environmental factors. It is important to establish personal relationships between athletes and coaches through effective interaction to prevent conflict from the dropout rate of athletes at a young age. In contrast to team sports, psychological problems such as anxiety and depression are more frequently experienced by adolescent athletes in individual sports (Nixdorf et al., 2016) & (van Hooft & van Hooff, 2018). Although many theories in sports psychology have revealed the advantages and disadvantages of democratic and autocratic styles, not all coaches understand the psychological obstacles experienced by adolescent swimmers and how to solve the problem considering the different styles of coaching they employ in exercise in Yogyakarta Province swimming clubs.

In a previous study, Weber et al. (2018) investigated symptoms of anxiety and depression in young athletes using

the Hospital Anxiety and Depression Scale (HAD Scale), but they did not identify the factors that contribute to anxiety in the coach-athlete relationship. This study aimed to analyze the effect of the relationship between coaching style and the performance achievement of adolescent swimmers through anxiety as a mediator. This study can be used to analyze the advantages and benefits of each coaching style applied in Yogyakarta Province swimming clubs as a strategy to achieve the desired performance targets through the self-report of several indicators provided.

## Materials and Methods

### Research Design

This type of research is a correlative descriptive method using the Structural Equation Modeling (SEM) approach with the help of Smart-PLS. The advantage of research using Structural Equation Modeling in Smart-PLS is that it can analyze a collection of each research variable systematically and comprehensively (Memon et al., 2021). Then this research also involves mediator variables and the recommended sample size is a minimum of 100 samples (Willaby et al., 2015). Thus, Smart-PLS will be more suitable to help analyze this research. Apart from that, this research tends to discuss the topic, namely sports psychology variables, where the results of research on the topic of sports psychology can also be analyzed using the Structural Equation Modeling (SEM) approach with the help of Smart-PLS (Hooi, 2020), (Pourabdol et al., 2020), (Nikbakhsh et al., 2022). With this analytical method, this research can produce new scientific work on previous theories. So from this research method, 4 hypotheses can be found, 1) the relationship between coaching style and the performance of swimming athletes, 2) the relationship between coaching style and anxiety, 3) the relationship between anxiety and the performance of swimming athletes, 4) the relationship between coaching style and the performance of swimming athletes through anxiety.

### Participants

In this study, the number of swimmers participating was 100 people, consisting of 68 male athletes and 32 female athletes. The athletes were adolescent swimmers who were in the junior age group of 12-18 years old. The participants were active swimmers who competed at regional and national levels and came from different swimming clubs in the Yogyakarta Special Region Province, Indonesia. The athletes involved have been champions at the regional level, as well as training experience of  $8.46 \pm 0.8$  years.

Experience of participating in competitions reported by swimmers, a maximum of 15 times and a minimum of 8 times. The average involvement in competitions in a year is 2 – 3 times, with an average of 3 competition numbers chosen. The average training time spent in a week is 4 - 5 meetings, with a duration of 2 hours in each meeting.

### Procedure

The first stage in this research procedure is to carry out observations at the swimming club to collect evidence according to the research objectives and then carry out an evaluation. From the results of the first stage, the club management and coaches allowed this research to be carried out. The second stage involves compiling the instrument in the form of a questionnaire, the process of compiling statement items until the formation of a questionnaire through the results of the discussion will be explained in the instrument sub-section after the procedure. The third stage is data collection which is carried out during holidays. This procedure is carried out so that athletes can focus on filling in answers without feeling tired after training or before training due to activities at school. The time taken from the initial stage to the final stage lasts for 2 months.

### Instrument

In preparing instrument items, the first stage was that we adopted several previous research results related to the

variables and topic of this research. The coaching style variable (democratic and autocratic behavior) is adapted from the instrument of The Multidimensional Model of Leadership (MML) by Chelladurai (2020) The instrument of competitive anxiety is adopted from the Competitive Anxiety Scale by Smith et al. (2006). Then, the sports orientation questionnaire was modified to measure athlete performance. Modification of performance items for swimming athletes is adjusted to the facts found and several other relevant research results (Núñez Prats & Garcia Mas, 2017; Borges et al., 2019; Pineda-Espejel et al., 2020; Barbosa-Granados et al., 2022).

After we created the instrument items, the next stage was an FGD (discussion group forum) with expert swimming lecturers, sports psychology lecturers, and several swimming coaches with national qualifications. From the results of the FGD, 32 instrument items were found that were suitable for use in research. The scale used in this study is 1 'strongly disagree', 2 'disagree', 3 'agree', and 4 'strongly agree'. The following is a research instrument grid

Table 1.

Instrument Grille

Variable	Statement	Item
Coaching Style (X)	Coaches always listen to criticism and suggestions/opinions from athletes	1
	Coaches exploit the potential of each athlete.	2
	Coaches limit communication with athletes.	3
	The coach sets the athlete's race number without discussion.	4
	The trainer implements a supportive relationship.	5
	Coaches provide personal attention when athletes experience defeat.	6
	Coaches often apply a system of punishment rather than rewards to athletes.	7
	I always follow the rules set by the coach.	8
	My coaches always pay attention and meets my needs	9
	The coach is very detailed in providing training programs to each athlete	10
Anxiety (M)	I was afraid of losing before competing.	11
	I always feel calm and focused when competing.	12
	My palms sweat easily	13
	My heart beats easily before competing	14
	I experience dizziness, nausea or need to go to the toilet during competition.	15
	I get cramps when I feel panicked	16
	I choose to socialize with other people to reduce nervousness	17
	I became quieter to maintain concentration.	18
	My panic decreased after the coach provided motivation.	19
	I feel more relaxed when I meet an opponent whose abilities are below mine.	20
Performance of Athletes (Y)	I feel that the quality of my swimming technique continues to improve.	21
	My mental ability to compete is very ready.	22
	My physical ability test results always improve.	23
	Physically, I can adapt well to heavy training.	24
	My training results and achievements have become better.	25
	I can carry out training according to the portion given by the trainer without excessive fatigue.	26
	The volume of training given by the coach is in accordance with my abilities.	27
	The intensity of the exercise provided by the coach is sufficient.	28
	I never arrive late for practice.	29
	I never reduce the portion of training given by the coach.	30
I almost always achieve the target time set by the coach.	31	
I almost never experience symptoms of overtraining	32	

### Results

The analysis in this research uses Smart PLS, then the following are the results of structural analysis using the PLS algorithm and bootstrapping (figure 1 and figure 2).

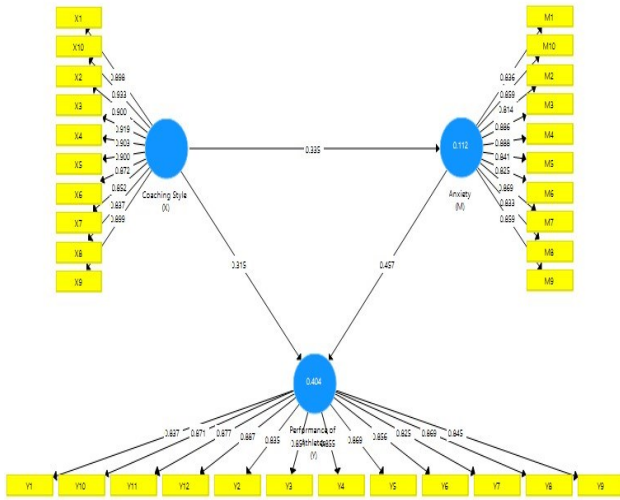


Figure 1. PLS Algorithm Result

### Instrument Item Validity

Table 2. Outer Loading Result

Code	Anxiety_(M)	Code	Coaching Style_(X)	Code	Performance of Athletes_(Y)
M1	0,836	X1	0,898	Y1	0,837
M10	0,859	X10	0,933	Y10	0,871
M2	0,814	X2	0,900	Y11	0,877
M3	0,886	X3	0,919	Y12	0,887
M4	0,888	X4	0,903	Y2	0,835
M5	0,841	X5	0,900	Y3	0,851
M6	0,825	X6	0,872	Y4	0,855
M7	0,869	X7	0,852	Y5	0,869
M8	0,833	X8	0,837	Y6	0,856
M9	0,859	X9	0,899	Y7	0,825
				Y8	0,869
				Y9	0,845

The variant-based SEM model, or path modeling, consists of the outer model, which is also known as a measurement model. In the outer model, we recognize loading factors. The PLS algorithm of our research shows the outer loading of each item used to measure the variable. The correlation between the indicator and the construct is shown by the outer loading values. The outside loading values for each variable teaching style, anxiety, and performance achievement are larger than 0.70, indicating that the variables are extremely trustworthy.

Table 3. Fornell-Larcker Criterion Result

	Anxiety_(M)	Coaching Style_(X)	Performance of Athletes_(Y)
Anxiety_(M)	0,851		
Coaching Style_(X)	0,335	0,892	
Performance of Athletes_(Y)	0,562	0,468	0,857

The Fornell-Larcker Criterion in the study is shown in Table 3. The Fornell-Larcker Criterion value must be

greater than 0.7 or by comparing the square root of the average variance extracted (AVE) value for each construct with the correlation between the construct and other constructs in the model. If the AVE root value for each construct is greater than the correlation value between the construct and other constructs in the model, then it is said to have a good value. It can be concluded that the statement items in the instrument used have good validity values.

### Instrument Item Reliability

The reliability of this research is presented in the table above. In reliability testing, Cronbach's Alpha exceeds 0.7 assumed reliable. Cronbach's Alpha values were found in this study for Coaching Style (0.971), Competitive Anxiety (0.958), and Athlete Performance (0.967). This shows that the data used in the research has a high level of reliability.

Table 4. Construct Reliability and Validity Result

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Anxiety_(M)	0,958	0,960	0,963	0,725
Coaching Style_(X)	0,971	0,976	0,975	0,795
Performance of Athletes_(Y)	0,967	0,970	0,971	0,734

### Fit Model Test

Based on the results of Table 5, the RMS Theta or Root Mean Square Theta value is 0.171 > 0.102 and the NFI value is 0.696 < 0.9. So based on these two model assessments, it does not meet the model fit criteria. However, based on the SRMR or Standardized Root Mean Square value, the value is 0.066 < 0.10 or 0.066 < 0.08, so the model is fit. Therefore, it can be concluded that the model fits the data

Table 5. Fit Model Result

	Saturated Model	Estimated Model
SRMR	0,066	0,066
d_ULS	2,293	2,293
d_G	3,549	3,549
Chi-Square	1395,836	1395,836
NFI	0,696	0,696
rms Theta	0,171	

### Assessment of Structural Model

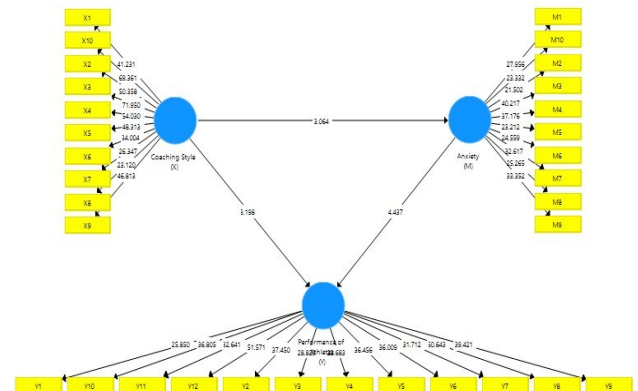


Figure 2. Assessment of Structural Model

Table 6.  
Hypothesis test results

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Values
Anxiety_(M) -> Performance of Athletes_(Y)	0,457	0,459	0,103	4,437	0,000
Coaching Style_(X) -> Anxiety_(M)	0,335	0,338	0,109	3,064	0,002
Coaching Style_(X) -> Performance of Athletes_(Y)	0,315	0,320	0,099	3,198	0,001
Coaching Style_(X) -> Anxiety_(M) -> Performance of Athletes_(Y)	0,153	0,156	0,066	2,313	0,021

Based on this table, it is found that 1) the relationship between coaching style and the performance of swimming athletes is P-Values 0.001, 2) the relationship between coaching style and anxiety, P-Values 0.002, 3) the relationship between anxiety and the performance of swimming athletes, P-Values 0.000, and 4) the relationship between coaching style and the performance of swimming athletes through anxiety P-Values 0.021. The four hypotheses, the four hypotheses can be accepted.

## Discussion

The character and behavior of the coach will positively and negatively influence athletes when giving instructions and tasks to improve their performance (Outlaw & Toriello, 2014). The selection of an appropriate coaching and leadership style will benefit athletes when competing (Keskes, 2014). The positive influence of instructions given during the training process and social support from the application of a democratic coaching style provides higher satisfaction to athletes (Jawoosh et al., 2022). The findings of this study conclude that adolescent athletes tend to prefer coaches who appreciate the efforts they make. The coach's appreciation serves as the biggest motivation for athletes to continue participating in their chosen sport. The changes in behavior are also common in competitive situations, with athletes becoming more withdrawn, sensitive, easily overwhelmed by emotions, and experiencing other temporary changes in their nature (Pita Niño et al., 2024), (Akbar et al., 2024). In this phase, they are experiencing a transitional stage where physical and psychological changes are visible. Nevertheless, if the pressure and anxiety that arise are at the right and stable level of psychological maturity, it will greatly help athletes increase their motivation to reach higher stages of achievement (Leunda-Goni, 2024). This condition is reinforced by the results of previous research, which states that coaching style affects athlete performance in terms of athlete satisfaction, decision-making, trust, stress, learning, and achievement of internal motivation (Atta et al., 2019), (Effendi et al., 2023). However, a coach's behavior during coaching can be influenced by many other factors, including the social environment.

Communication between coaches and athletes will indirectly lead athletes to the goal of achieving passion in sports. Coaches who put a lot of pressure on athletes beyond their psychological capabilities will have negative effects such as stress and anxiety. Anxiety levels influenced by their relationships with parents, friends, teachers, partners, and coaches (Weber et al., 2018). According to the results of the data analysis above, it can be stated that anxiety becomes

a controlling factor in the athlete-coach relationship.

Furthermore, the democratic coaching style is still the most recommended method for swimming coaches to increase athletes' sense of pleasure during the training process. This means that coaches who are open to athletes' complaints and accept advice will provide a sense of comfort and safety for athletes to share the obstacles they experience, which have the potential to reduce their performance levels. Based on a study in Albania Province, the democratic coaching style was found to be an effective coaching style applied to adolescent swimmers as compared to the autocratic coaching style (Labarda, 2022). Both coaches and athletes will provide feedback to each other to find solutions by building better interpersonal relationships. Coaches who tend to lean towards a democratic coaching style will usually provide clear instructions accompanied by explanations of specific training plans and goals (Jin et al., 2022).

On the other hand, the autocratic coaching style of coaches has the potential to increase stress levels in athletes more than the democratic coaching style. Coaches who tend to apply autocratic coaching styles will cause athletes to release 9 times more cortisol due to the great threat and pressure given by coaches to athletes, which causes stress (Ucar et al., 2018). Autocratic coaching styles can be seen as a source of stress for athletes, manifesting as anxiety symptoms that can hinder their future performance (Oberle & Schonert-Reichl, 2016). However, in some cases, autocratic coaching styles also have a positive effect on athletes' performance, especially in team sports. The decision-making process will be more effective with one instruction and command from the coach (Jin et al., 2022). Therefore, applying the appropriate coaching style can have a positive impact on changes in the behavior and motivation of athletes (O'Neil & Hodge, 2020).

## Conclusion

The influence of coaching style has a significant influence on improving sports performance based on direct analysis or analysis through the anxiety of swimming athletes. Therefore, coaches must be able to quickly adapt and apply a coaching style that suits the situation. The results of this research can be a reference for further research regarding the application of coaching styles in various sports and age groups. In addition, coaches must further develop their skills and techniques and focus on the physical development of athletes through a systematic training process that meets individual needs. Regular evaluations should also be conducted to track the athlete's

progress. In this study, the number of participants was limited to only 100 teenage swimmers. Participant age is also limited to 12-18 years. A larger number of participants, different age groups of swimmers, and different genders would be interesting research to explore. Future research will produce comparative studies regarding the influence of coaching styles on sports performance and provide more evidence for researchers. Based on this research, swimming coaches are expected to adopt different coaching styles in any situation depending on personal goals, individual skill development, and athlete maturity.

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