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The Effect Of Eye-Hand Coordination, Kinesthetic Perception And Anxiety On The Results Archery Scoring Of Athlete U-12 West Jakarta

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Abstract This study aims to reveal the direct and indirect effects, as well as the simultaneous effect of exogenous variables on endogenous variables. The sample in this study were 37 archers from all clubs in the West Jakarta area. The research approach used in this study is an associative quantitative approach with test techniques. The data analysis technique uses a path analysis approach (path analysis). The results showed that: 1) there was a direct effect of eye-hand coordination on the archery scores of U-12 archery athletes in West Jakarta amounted to 6.7%, 2) there was a direct influence of kinesthetic perception on the results of archery scoring results for U-12 archery athletes in West Jakarta. is 1.69%, 3) there is a direct and significant effect of anxiety on the archery scores of U-12 archery athletes in West Jakarta, which is 15.8%, 4) there is a direct and significant effect of eye-hand coordination on the anxiety of U-12 archery athletes. West Jakarta by 43.96%, 5) there is a direct and significant effect of kinesthetic perception on the anxiety of West Jakarta U-12 archery athletes by 44.76%, 6) there is an indirect effect of eye-hand coordination through anxiety on archery scoring results are of 27.35%, 7) there is an indirect effect of kinesthetic perception through anxiety on the archery scoring results of 18.9%.

Keywords: eye-hand coordination; kinesthetic perception; worry; West Jakarta U-12 archery scoring results

INTRODUCTION

The achievements of the sport of archery in Indonesia are very proud. The Olympics is the largest international sporting event. Indonesian archery has never been absent in the Olympics, although it has never been absent in the biggest sporting event among nations, Indonesian archers have not been able to bring medals back to Indonesia, the archery achievement at the last Olympics in 1988 in Seoul. The sport of archery was the first contributor to medals at the Olympics in Seoul, South Korea in 1988.

Archery is currently still continuing to nurture athletes from an early age to adulthood because archery in Indonesia is one of the sports that is able to donate medals from Asian and world competitions, for example at SEA GAMES 2019 Indonesia was able to give gold. Indonesia's archery achievements should be proud of because Indonesian archery always donates medals for Indonesia at every world championship (Adipati, 2019). There are still a lot of people who think that archery is an easy and light sport because it only does the same movement and is not heavy.

Archery is a cyclical sport in the form of a close skill. Skills with stimuli that remain the same and require stability in the response in their movements (Pelana, 2017). Cyclic is the effect of repetitive motor movements such as swimming, archery, bicycle racing, rowing, and others (Bompa, 2009)**.**

Archery when viewed from a biomechanics point of view, namely throwing objects to achieve maximum accuracy, then from a motor point of view, it means a closed skill whose stimulus does not change (Wattimena, 2015). In the sport of archery in Indonesia, the bows used for matches are 3 recurve, compound and standard bows (Vanagosi, 2015).

Scoring in archery is a major indicator in determining victory in archery (Munawar, Hidayatullah, & Kristiyanto, 2014). Archery is a sport that relies on accuracy to hit the target because the aim of archery is to shoot arrows on the target surface as precisely as possible (Hardi, 2018).

Archery requires physical factors such as good motor skills and good psychological factors, namely a good level of anxiety (Munawar et al., 2014). Seeing the conditions in the field, especially at the age of children, when the majority of matches experienced a decrease in appearance performance, such as fatigue, many poor scoring

results and also excessive anxiety.

Archery is a fairly complex sport because archers cannot use arrows without knowing the tools used, the techniques used and also the conditions of the surrounding environment. Physical factors, technical factors and psychological factors are aspects of supporting achievement for the sport of archery (Pelana, 2017).

Judging from the physical factor, biomotor ability, especially coordination in the archery branch, is one of the dominant ones, the technical factor that is the support to get maximum performance for an athlete is the aspect of biomechanical efficiency to get good scoring results.

This aspect requires the athlete to apply the correct and consistent technique in every arrow release. One way to improve the sense of motion in order to get consistency and constancy is by using kinesthetic imagery (performing the sensation of movement and feeling it). Psychological factors are one of the supporting aspects to get a good archer performance. An athlete's mentality must also be prepared properly. One way to build a good mentality is to communicate between the coach, parents or friends of the athlete.

In the sport of archery, closed skill movements are movement patterns that are consistent and do not change, therefore archery is very closely related to movement coordination (Pelana, 2017). Without having good movement coordination skills, individuals will find it difficult to learn basic technical skills. Basic movement ability is a movement pattern that starts from a simple pattern and then develops into a complex movement pattern.

Eye-hand coordination in archery can affect accuracy, where the assessment of archery is shooting accuracy (Zakaria, Purnomo, & Samodra, 2018). Coordination is also a combination of muscle, bone and joint contractions in displaying a motion, so that coordination ability is closely related to other motor skills such as balance, speed, accuracy, and agility (Amin, 2012). Coordination is the ability to perform movements at various levels of difficulty quickly and efficiently with accuracy (Margono, Yagusta, & Khuzaini, 2018). The more complex the movement, the higher the level of coordination (Alimin, 2019). So that the practice of archery that requires eye-hand coordination aspects to get

maximum scoring results is needed by archers.

Motor movement in children is very basic and very important because it is at this phase that children recognize and enrich every movement (Sukadiyanto, 2003). Each child has a different level of motor skills that cannot be generalized to other children, there are some children who have very good gross motor skills such as running, jumping, hitting but usually these children have poor fine motor skills such as writing, coloring and drawing.

According to (Rismayanthi, 2013) gross motor coordination skills in children include all parts of the body or only part of the body's organs that are used when moving. Gross motor coordination abilities include dexterity, endurance, flexibility, balance, speed and strength. The ability of motor movement is further divided into three, namely non-locomotor motion, locomotor motion and also manipulative motion. According to (Hidayat, 2017) the motion that moves the body from one place to another is called locomotor motion. Movements that do not require room for movement are called non-locomotor movements whose movements include pushing, pulling, bending, swinging, lifting and twisting.

Kinesthetic perception is a person's ability to sense body movements from visual or auditory devices, the higher the level of sense of motion sensitivity, the higher the sense of position and control of movement (Hendrayana, 2015). Perception is a sensing process, which is the process of receiving a stimulus by the individual through the senses or also called the sensory process (Suryono, 2016).

Perception is a limitation used in the process of understanding and interpreting sensory information or the ability of the intellect to seek meaning from data received by the various senses indra (Zhanissa et al., 2017). the more a person performs the same movement continuously in the long term, the human sense of motion will remember the movement because of the sensory processes in the body (Rosmi, 2017).

In archery, kinesthetic perception is important because the sport is a sport that requires a sense of motion to get maximum scoring results (Akbar, Andi Khemal, 2018a). Kinesthetic perception is a function of the organs of the human body which is closely related to body movements and body parts both

passively and actively (Ngadenan, 2015).

According to (Wattimena, 2015) anxiety can arise because of ongoing or existing situations that cause threats and insecurity. Anxiety is an unpleasant feeling caused by a threatening situation (Jannah, 2017). Anxiety in sports is the pressure given to athletes to give the best performance results, matches and competitions are one example of a threat that can cause anxiety.

Based on the facts in the field, the mental condition of children who are still very unstable is very difficult to make children reduce their anxiety when doing archery matches or competitions. because in fact in the field of children it is still very difficult to reduce anxiety because of many factors such as external and internal factors. External factors that are often encountered by children are the environment and opponents, while on the internal factor children are often not confident which causes anxiety and causes poor performance in matches. In addition, researchers also want to know whether anxiety in archery can affect archery scoring results.

With the development of the sport of archery in Indonesia with the increasing number of archery clubs. Each club has an age category to categorize the training program with the majority of children's ages. Researchers are very interested in researching the problems that have been presented in the background. So that this study raises the issue with the title of the effect of eye-hand coordination, kinesthetic perception and anxiety on the results of West Jakarta U-12 archery scoring.

METHOD

Research Design

In this study, researchers used quantitative associative research methods, with quantitative approaches and survey methods techniques and used path analysis techniques. Path analysis is an analytical technique used to analyze the inherent causal relationship between variables arranged in a temporary order by using path coefficients as the value in determining the magnitude of the effect of the exogenous independent variable on the endogenous dependent variable (Sarwono, 2011).

The variables studied consisted of four variables consisting of three exogenous variables and one endogenous variable. Exogenous variables consist of Eye-Hand Coordination (X1), Kinesthetic Perception (X2), Anxiety (X3) and

endogenous variables are the results of archery scoring U-12 West Jakarta (Y).

This research was carried out from May 2021 to June 2021. The place of research was carried out in West Jakarta which was in 5 clubs.

Population and Sample

The population is a generalization area consisting of objects/subjects that have certain qualities and characteristics set by the researcher to be studied and then draw conclusions (Sarwono, 2011). In this study the target population or target population is 5 clubs with a total of 60 archers who are active members of all clubs in the West Jakarta area.

Sampling technique is a sampling technique to determine the sample to be used in research. Purposive sampling is a technique for determining a sample of certain considerations (Sugiyono, 2015). The sample to be used is 37 archers from all clubs in the West Jakarta.

Research Instrument

The research instruments used in this study were 1) Archery scoring test results using a test instrument shooting arrows through the face of a target or target, 2) Eye-hand coordination test using a hand throwing test and catching a ball with a score on a wall that has been determined by the value in each box respectively, 3) The kinesthetic perception test uses the kinesthetic perception test, 4) The anxiety test uses the Indonesian version of the Sport Anxiety Scale (SAS) questionnaire test, which was adapted from (Smith, Smoll, Schutz 1990).

Data Analysis

The data obtained were analyzed using statistical formulas in the form of data descriptions, normality tests, linearity tests and regression significance tests. After the normality test, linearity regression test, and regression significance were carried out, then followed by path analysis to test the research hypothesis. The data analyzed in this study consisted of four units of analysis, namely: 1) Eye-hand coordination test results (X1), 2) Kinesthetic perception test results (X2), 3) Anxiety test results (X3), 4) U-12 archery scoring results West Jakarta (Y).

RESULTS

1. Structural Model Testing I

Based on table 1, it appears that R2 of 0.868 means that 86.8% of the kinesthetic perception variable (X2) can be explained by the eye-hand coordination variable (X1). So

the error (ε_1) = 1- R2 = 1 – 0.931 = 0.069. Coefficient of eye-hand coordination pathway (X1) and kinesthetic perception (X2) or (p21) = 0.931 obtained Sig value. = 0.000//2= 0.00 < = 0.05. From the results of testing the structural model 1 is significant. For more details can be seen in the following image:

Table 1.

Structural Model Path Coefficient I

Variabel	R^2	Koef Beta	*P-Value/2*	Information
X_1, X2 (p_{21})	0,868	0,931	0,00	Significant

2. Structural Model Testing II

Based on table 4.15, it appears that R2 of 0.886 means that 88.6% of the anxiety variable variable (X3) can be explained by the eye-hand coordination variable (X1) and kinesthetic perception (X2). So the error (ε_2) = 1- R2 = 1 – 0.886 = 0.114. The path coefficient (X1) against (X3) or (p31) = 0.663 and (X2) against (X3) or (p32) = 0.669 obtained the value of Sig. = 0.000/2 = 0.000 < = 0.05 and Sig. = 0.000 /2 = 0.00 < = 0.05. From the results of testing the structural model 2 is significant. For more details can be seen in the following image:

Table 2.

Structural Model Path Coefficient II

Variabel	R2	Koef Beta	*P-Value/2*	Information
X_1, X_3 (p_{31})	0,886	0,663	0,000	Significant
X_2, X_3 (p_{32})	0,889	0,669	0,000	Significant

3. Structural Model Testing III

Based on table 3, it appears that R Square (R2) of 0.971 means that 97.1% of the archery scoring results (Y) can be explained by the eye-hand coordination variable (X1), kinesthetic perception (X2) and anxiety (X3). So the error (ε_3) = 1- R2 = 1 – 0.971 = 0.029. Based on ANOVA in table 4.16, it is obtained that Fo = 371,020; db1 = 3; db2 = 33, p-value 0.000 <0.05 or Ho is rejected. Thus, the variables of eye-hand coordination (X1), kinesthetic perception (X2), anxiety (X3) simultaneously affect the archery scoring results (Y) of West Jakarta U-12 archery athletes. For more details can be seen in the following image:

Table 3.

Structural Model Path Coefficient III

		Model 1	ANOVA	Df
R		.985	Regression	3
R Square		.971	Residual	33
Adjusted R Square		.969	Total	36
Std. error of the Estimate		.301		
Change Statistics	R Square Change	.971	F	371.020
	F Change	371.020	Sig.	.000[b]
	df1	3		
	df2	33		
	Sig. F Change	.000		

a. Dependent Variable: Scoring Archery

b. Predictors: (Constant), Anxiety, Kinesthetic perception, Eye-hand coordination

Discussion of Research Results

Based on the test results of all the hypotheses that have been carried out in the hypothesis testing section, it can be stated that:

First, based on the results of the research conducted, that there is a direct effect of eye-hand coordination on the archery scores of the U-12 archery athletes in West Jakarta with the path coefficient Py1 = 0.259 with a value of Sig. = 0.000 < = 0.05. It turns out that hand eye coordination has a direct and significant effect on archery scoring results. The effect of eye-hand coordination on archery scoring results is 6.7%. While the remaining 93.3% are influenced by other factors. Based on these findings, it can be concluded that the archery scores of the U-12 archery athletes in West Jakarta are directly influenced by eye-hand coordination.

Second, Based on the results of the research conducted, that there is a direct influence of kinesthetic perception on the archery results of the U-12 archery athletes in West Jakarta with the path coefficient Py2 = 0.130 with a value of Sig. = 0.021 < = 0.05. It turns out that kinesthetic perception has a direct and significant effect on archery scoring results. The effect of kinesthetic perception on archery scoring results is 1.69%. While the remaining 98.31% are influenced by other factors. Based on these findings, it can be concluded that the archery scores of the U-12 archery athletes in West Jakarta are directly influenced by kinesthetic perception.

Third, based on the results of the research conducted, that there is a direct influence of anxiety on the archery scores of the U-12 archery athletes in West Jakarta with the path coefficient Py3 = 0.398 with a value of Sig. = 0.000 < = 0.05. It turns out that anxiety has a direct and significant effect on the results of archery scoring. The effect of anxiety on archery scoring results is 15.28%. While the remaining 84.72% are influenced by other factors. Based on these findings, it can be concluded that the archery scores of the U-12 archery athletes in West Jakarta are directly affected by anxiety.

Fourth, based on the results of research conducted, that there is a direct effect of eye-hand coordination on anxiety, the path coefficient results P31 = 0.663 with a Sig value. = 0.000/2 = 0.000 < = 0.05, so Ha accepts and Ho is rejected. That is, there is a direct effect of eye-hand coordination on the anxiety of West Jakarta U-12 archery athletes. Based on these results, the direct effect

of eye-hand coordination on the anxiety of the U-12 archery athletes in West Jakarta is 43.96%, while the rest are other factors that are not explained in this study.

Fifth, based on the results of research conducted, that there is a direct influence of kinesthetic perception on anxiety, the path coefficient results P32 = 0.669 with a Sig value. = 0.000/2 = 0.000 < = 0.05, so Ha accepts and Ho is rejected. That is, there is a direct influence of kinesthetic perception on the anxiety of West Jakarta U-12 archery athletes. Based on these results, the magnitude of the direct influence of kinesthetic perception on the anxiety of the U-12 archery athletes in West Jakarta is 44.76%, while the rest are other factors that are not explained in this study.

Sixth, Based on the analysis test results that the value of the indirect influence path coefficient given the intervening variable (p31.py3) is greater than the direct influence path coefficient value (py1) eye-hand coordination on the archery scoring results (p31.py3 = 0.264 > py1 = 0.259). Thus, indirectly there is a mediating effect given by the eye-hand coordination variable through anxiety on the archery results of West Jakarta U-12 archery athletes. The total direct effect of eye-hand coordination on the results of archery scoring and the indirect effect given through anxiety is 0.523 or 27.4%. Based on previous findings, the direct effect of eye-hand coordination on archery scoring results was 0.259 or 6.7%, while the effect of eye-hand coordination through anxiety on archery scoring results was 0.523 or 27.35%. This means that if these two variables are integrated, the effect obtained is very significant. It can be interpreted that eye-hand coordination through anxiety has a greater influence on the archery results of West Jakarta U-12 archery athletes.

Seventh, Based on the analysis test results that the value of the indirect influence path coefficient given the intervening variable (p32.py3) is greater than the direct influence path coefficient value (py2) kinesthetic perception of the archery scoring results (p32.py3 = 0.266 > py2 = 0.169) . That is, indirectly there is a mediating effect given by the kinesthetic perception variable on the archery scores of the U-12 archery athletes in West Jakarta. The total direct effect of kinesthetic perception on archery scoring results and the indirect effect given through anxiety is 0.435 or 18.9%. Based on previous findings, the direct effect of kinesthetic perception on

archery scoring results was 0.130 or 1.69%, while the effect of kinesthetic perception through anxiety on archery scoring results was 0.435 or 18.9%. This means that if these two variables are integrated, the effect obtained is very significant. It can be interpreted that kinesthetic perception through anxiety has a greater influence on the archery scores of West Jakarta U-12 archery athletes.

CONCLUSION

Conclusions were drawn based on research findings with exogenous variables consisting of hand eye coordination (X1), kinesthetic perception (X2) and anxiety (X3). The endogenous variable is the archery score of the U-12 archery athlete in West Jakarta (Y), as follows:

1. Eye-hand coordination has a direct and significant effect on the archery results of archery U-12 athletes in West Jakarta by 6.7%.
2. Kinesthetic perception has a direct and significant effect on the archery results of the U-12 archery athletes in West Jakarta by 1.69%.
3. Anxiety has a direct and significant effect on the archery scores of U-12 archery athletes in West Jakarta by 15.8%.
4. Eye-hand coordination has a direct and significant effect on the anxiety of West Jakarta U-12 archery athletes by 43.96%.
5. Kinesthetic perception has a direct and significant effect on the anxiety of West Jakarta U-12 archery athletes by 44.76%.
6. Eye-hand coordination has an indirect effect on archery scoring results through the anxiety of West Jakarta U-12 archery athletes by 26.4%.
7. Kinesthetic perception has an indirect effect on archery scoring results through the anxiety of West Jakarta U-12 archery athletes by 26.6%.

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