

Visual Perception of Sport Coaches for Some Kinematic Variables of the Gymnastic Vaulting Table

الإدراك البصري للمدربين لبعض المتغيرات الكينماتيكية لمهارة القفز على جهاز القفز

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Abstract

Aim: To examine the visual perception of sports coaches for some kinematic variables of the gymnastic vaulting table. **Methods:** The researcher used the descriptive method in this study. and used Ten Sports Coaches of gymnastic as subjects of this study from the physical education faculty at Yarmouk University. Study tools: The researcher prepared a special questionnaire, including 38 items related to kinematic variables and some random mistakes for the Vaulting Table skill phases. The coaches watched players' performance, then after every player's vault attempt, the questionnaire was distributed directly to sports coaches. The researcher placed three sunny digital video cameras in different locations perpendicular to the vault table apparatus, ten undergraduate male gymnastic players from Yarmouk University - physical education department was recorded while they performed vault skills. The researcher analyzed the videotaped of the vaults of gymnastic players, then the researcher compared the videotape with the responses of Sport Coaches on questionnaires to identify the ability of sports coaches' visual perception.

To analyze the player's vault videotape, the researcher used a computer program called (Super decoder) for Vaulting Tables kills analysis. The researcher computed statistics in SPSS statistic software, like percentages and repetitions. **Results:** Study results were: "the weakest percentage in visual perception ability was in the pre- and post-flight phases. The strongest percentage in visual perception ability was in the approach phase. Watching kinematic variables of sports skills is not enough to distinguish skills, especially fast ones. Feedback by watching the performance does not improve the skill level in fast movements". **Recommendations:** The researcher of this study recommends coaches focus on recruiting more senses and different coaching aids in increasing coaching visual perception ability and proper understanding of movement and thus motor learning. Coaches should familiarize themselves with different coaching and training sources related to their sport, and learn how to recruit them in different training situations.

Keywords: Motor learning. Visual Perception, kinematic, Sport Coaches.

ملخص

أهداف البحث: هدفت الدراسة إلى التعرف على الإدراك البصري للمدربين لبعض المتغيرات الكينماتيكية لمهارة القفز على جهاز القفز. **منهجية البحث:** استخدم الباحث المنهج الوصفي في هذه الدراسة، اشتملت عينة الدراسة على (10) من مدربي الجمباز من جامعة اليرموك في كلية التربية الرياضية، وتم استخدام استمارة خاصة تحتوي على 38 فقرة ترتبط ببعض النواحي الكينماتيكية والأخطاء الشائعة لمراحل مهارة الوثب على جهاز القفز، قام مدربي الجمباز بمشاهدة أداء لاعبي الجمباز وبعد أداء كل لاعب كان يتم توزيع الاستبانة بشكل مباشر على المدربين ليتم الأجابة على الاستبانة مباشرة ثم تجمع بنفس الوقت، قام الباحث بوضع ثلاث كاميرات رقمية سوني في مواقع مختلفة بشكل عمودي مع اتجاه جهاز الجمباز اي مرحلة الحركة كاملة، عشرة لاعبي من لاعبي الجمباز في جامعة اليرموك تم تصوير اداء مهارة الوثب على جهاز القفز. ثم تم تحليل شريط التصوير للمهارة حيث قورن التصوير مع إجابات المدربين على الاستمارة لمعرفة الإدراك البصري لدى مدربي الجمباز للمتغيرات الكينماتيكية لمهارة الوثب على جهاز القفز في الجمباز، تم استخدام برنامج (سوبر ديكودر) في للتحليل الحركي لتحليل الصور وتقطيعها لمقارنة الإدراك البصري للمدرب مع ما تم فعلا من مهارات الجمباز. استخدم الباحث التكرارات والنسب المئوية في التحليل الإحصائي. **النتائج:** وقد أظهرت نتائج الدراسة أن أضعف نسبة في قدرة الإدراك البصري للمدربين كانت في مرحلتي الطيران الأول والثاني، وأقوى نسبة في قدرة الإدراك البصري للمدربين كانت في مرحلة الاقتراب، مشاهدة العوامل الكينماتيكية لا تكفي لتميز

المهارات وخصوصا السريعة، التغذية الراجعة من خلال مشاهدة الأداء لا تكفي للتقدم بالمستوى المهاري في الحركات السريعة. **الخلاصة:** يوصي الباحث على تركيز المعلمين لتوظيف حواس أكثر ووسائل تدريبية مختلفة لزيادة نسبة قدرة الإدراك البصري للمدربين والاستيعاب السليم للحركة وبالتالي التعلّم الحركي. أن يتعرف المدرس على مختلف المصادر التي تتعلق بمادة تخصصه، وكيف يوظفها في المواقف التعليمية المختلفة.

الكلمات المفتاحية: التعلّم الحركي، الإدراك البصري، الكينماتيك، مدرب الرياضي.

Introduction

Visual perception is a complex process using the sensory nervous system by the Sports Coaches to receive, analyze and understand sports skills, not only slow-motion skills but also fast motion skills, which is fruitful in sports games, especially in gymnastic games. (Shahrour, 2017, P. 46), (Shafer, Solomon, Newell, Lewis, Bodfish, 2019), (Dember, Wiliam, & Jolyon 2023).

Sport Coaches as a part of the sports field attempt to improve the performance of players by providing the right instructions that come from observing the skills of players and then giving correct feedback through their visual perception.

The visual system has the difficult task of comprehending a difficult three-dimensional world from two-dimensional pictures on each retina. Pictures of things at a distance other than at the fixation plane are projected to dissimilar relative positions on the two retinas (Shinsuke, Michael, and Ichiro, 2001, P. 12340).

Vault is one of six apparatus for men of the artistic gymnastics sport, The gymnastic technique can have a large effect on performance. The technique of Vaulting has an important influence on real performance; therefore, a lot of time is spent on improving the neuromuscular coordination on motor skills of gymnastic players in the practice of long-term training, gymnasts exhibit different patterns of neuromuscular coordination aimed to implement. (Bartłomiej, *et al.* 2021. P15). The method of training motor skills in gymnastics was a coach's visual and verbal instructions provided during the gymnastic training. through video pictures of expert rowers or pictures of the subject.

Aims of Study

To examine the visual perception of sports coaches for some kinematic variables of the gymnastic vaulting table.

Background literature

Training and teaching success for sport coaches is usually regarding to the ability to perceive players information skills. Visual perception is an important element for training, teaching gymnastic vault table skills and developing the complicated skills of vault table (vault horse) gymnastic sport in best strategy.

visual perception can give the right feedback that enhances performance. (Tzetzis, Zachopoulou & Kioumourtzoglou, 1999, P. 137), (Leslie, 1998), (Sanders, 1995, P. 665). Therefore they assure this statement by their studies as shown below:

(Tzetzis, Zachopoulou & Kioumourtzoglou, 1999, P. 137) divided unsystematically 75 students into 3 classes. class 1 viewed a video of a trained model, class 2 watched a video of their performance with spoken instruction from a coach, and class 3 obtained coach instruction. Motor skills were calculated 24 hours after monitoring the video and practicing the skills. The gigantic motor skill improvement was in skiers as a result of both visual modeling and spoken feedback (Group 2).

In (Leslie, 1998) study figured out that Video-computerized feedback integrated with a video of a professional model has improved baseball hitting performance

(Sanders, 1995, P. 665) indicated that video feedback provided in two separate sessions. Experienced swimmers improve their technique in a period using both coaching and visual feedback

The were many researches split the vault skills into phases, the researcher mention those who concentrated on every single phases of the vault like: (Penitente, Merni, Fantozzi, & Perretta, 2007), (Velickovic, Petkovic, & Petkovic, 2011. P25); pre-flight phases (Koh & Jennings, 2007, P. 1256), (Yeadon, King, & Sprigings, 1998, P. 349), or post-flight

physical education faculty. Sports coaches watched the gymnastic vault performance of players then after every vault attempt the questionnaire was distributed directly to sports coaches. The researcher analyzed the videotaped gymnastic vaulting, then compared it with the responses of Sport Coaches on the questionnaire to identify the ability of visual perception of sports coaches. To analyze the vault of player video tape researcher used a computer program called (Super decoder) for Vaulting Tables skills analysis.

Questionnaire: A special questionnaire is divided into two sections. In the first section personal information, coaches gave demographic-related information such as gender, education level, coaching years, and age, second section questions related to vault skill phases including six phases [1-(approach) include 5 kinematic questions, 2-(springboard support) include 8 kinematic questions, 3-(pre-flight) include 10 kinematic questions, 4-(vault support) include 7 kinematic question, 5-(post-flight) include 3 kinematic questions and 6-(landing) include 5 kinematic questions] and every phase divided to kinematic variable items with total 38 items, as shown in appendix (1). The reliability and validity of the questionnaire were calculated. Internal consistency is the degree to which items within a ranking are correlated with each other. Thus, Chronbach's coefficient and Pearson's correlation was utilized, and a magnitude of at least 0.8 was considered as an index of reliability, as in figure (1).

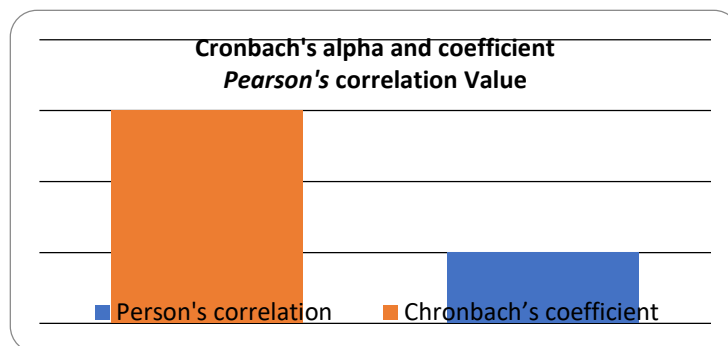


Figure (1): Cronbach's alpha and coefficient Pearson's correlation Value.

The results from the table indicated that the approach phase had the highest correct percentage of visual perception (42.0%), followed by the landing phase (41.4%), and the vault support phase (39.7%) in third place. then Springboard support (Take off) phase arrived with percent (38 %) more over in final positions pre-flight and post-flight phases came successively with percentage (37.8%) (26.7%), and the total visual perceptual of coaches percentage was (38.3%).

Regarding data acquired retrospectively from questionnaire responses by Sport coaches.

This study figured out that the Visual Perception of Coaches ability was relatively weak, as the table shows that the percentage of the total visual perception ability of the skill was (38.3%). The reason for this may be that perceiving the movements by observing the kinematic factors is not sufficient to distinguish the skills, especially the fast ones, without recognizing the kinetic factors causing the movement, and this requires a complete analysis of the movement to assist the visual perception, as a result, it is not possible to rely on visual perception only to realize sports movement. These results agreed with the study of (Jeroen, Smeets & Eli, 2001, P. 1006). That states" As vision is closely related to the degree of information available to the individual about the performance he watches, and this is consistent with the study.

Conclusion

Results indicate the weakest percentage of visual perception ability was in the pre and post-flight phases. The strongest percentage in visual perception ability was in the approach phase.

Watching kinematic variables of sports skills is not enough to distinguish skills, especially fast ones. Feedback by watching the performance is not sufficient to improve the skill level in fast movements.

The researcher recommends Coaches focus on recruiting more senses with different coaching aids to increase their perception ability and proper understanding of movement and thus motor learning. coaches should

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Appendix 1

Approach phase	
1	Did the player run as follow: a) straight b) zigzag c) not specified
2	Did the player run on his. a) Full feet. b) Metatarsals (parts of the front foot)
3	Were the final steps of the player in approach running. a) Bigger than the previous steps. b) less than the previous steps.
4	Did the player at the end of the approach run? a) Take a step b) hesitation in steps c) Nothing was done
5	Did the movement of the arms and legs while running move as follows: a) The right arms with the left leg as a sprint. b) The arms are not compatible c) The arms are stiff while running.
Springboard support phase	
1	Did the player jump on springboard. a) with one foot only b) with two legs c) unspecified
2	Did the (landing) touching springboard of player. a) With the metatarsals (the front parts of the foot) together. b) only with one foot c) With feet together
3	Were the player's arms when (landing) at the moment of touching springboard. a) side down b) sideways c) forward d) up
4	Was the player landing on the part of springboard: a) The first third b) The middle c) The last third
5	Was the angle of the landing of the body at the moment of touching the springboard at an angle. a) Ninety off the horizontal (vertical) axis b) Bigger than ninetieth from the horizontal axis (bigger than the vertical) c) less than one-ninth from the horizontal axis (less than the vertical)
6	Were the trunk and head when landing at the moment of touching the springboard. a) head and trunk are straight b) The head is slightly forward c) The head is slightly back
7	Were the player's knees at the final push at the moment of leaving the springboard? a) not flexed b) little flexed c) much flexed
8	Were the player's head when landing at the moment of touching the springboard. a) straight b) slightly forward c) slightly back
Pre-flight phase	
1	Was the angle of flight of the player's body at the moment of leaving the springboard at an angle? a) Ninety with the horizontal (vertical) axis

2	Was the supporting on the horse? a) with both hands c) not touching the horse	b) with one hand
3	Were the angles of the joints of the elbows and shoulders at the moment of supporting the hands on the horse? a) In a straight line. c) Flexion in the shoulder joints.	b) Flexion in the elbow joints. d) flexion in the joints of the elbows and shoulders.
4	Were the trunk and the two legs at the moment of the supporting arms on the horse? a) With the horizontal plane over the horse. b) higher than the horizontal level over the horse. c) Below the horizontal level over the horse.	
5	were the two legs opened at moment of? a) supporting on the horse c) after supporting on the horse	b) before supporting on the horse
6	Were the two legs at the moment of the supporting arms on the horse? a) Over the level of the hip joint c) With the same level as the hip joint	b) Below the level of the hip joint
7	Were the arms at the moment of pushing the horse with the arms after supporting, moving to the direction of? a) forward up b) forward down	c) to the side
Post-flight phase		
1	Did the player fly after supporting on a horse? a) As far and up as possible from the horse. c) Far and low from the horse.	b) near and low on the horse.
2	The moment the body reaches its highest point (height)? a) stretching all angles of the joints of the body in a straight line b) Bend at the knees and hip joint. c) flexion at the shoulder joint and elbows. d) Bend at the knee joint only.	
3	Are the two legs joined after pushing (letting off) the horse? a) When the body reaches its highest height. b) before the body reaches its highest height. c) After the body reaches the highest height and before landing. d) On landing. e) It did not include the two legs.	
Landing phase		
1	Did he land on the ground on: a) two metatarsals b) feet	c) one metatarsal d) one foot

