Imagery Model and Sport Confidence on Karate Kata Motion Skills

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Abstract: The aim of this study was to compare the influence of PETTLEP imagery and relaxation imagery on the learning of karate kata. The samples were 40 novice futsal karateka who had been training for two months. To achieve the purpose, a 2x2 factorial design was employed. The data were analyzed using a two-way ANOVA in SPSS 23. The results revealed that the PETTLEP imagery model was better than the relaxation imagery model in improving karate kata motion skills. The relaxation imagery model did not significantly influence karate kata motion skills in high sport confidence. The PETTLEP imagery model was better than the relaxation imagery model both in high and low sport confidence.

1 INTRODUCTION

Imagery is the exercise of mental skills by raising the imagination of motion patterns or situations in the mind that involves the elements of the senses so that the sensation felt when imagining is similar to the actual situation (Weinberg and Gould, 2011; Eklund and Tenenbaum, 2014). There are several models of imagery exercises, one of them is imagery model which started with relaxation developed by Suinn (1972). This imagery model is called visuo-motor rehearsal behavior (VMBR). Relaxation before imagery can alter the athlete's physiological state, such as heart rate, blood pressure and muscle tension (Weinberg, et al., 1981). In addition, the purpose of giving relaxation is to clear the mind of the distracting things and make the atmosphere quiet and calm. Relaxation imagery is also called the traditional imagery.

Some researchers have criticized the weaknesses of imagery relaxation. Holmes and Colins (2001) stated that relaxation before imagery was a way of treatment from the past that was done for generations and not a theory that emerged from the evidence of research. Some studies have shown that imagery relaxation has no impact on sport performance (Gray, 1989; Weinberg et al., 1981; Zervas and Kakkos, 1991). In addition, imagery scripts that used the one size fits all rule (one for all) are less precise because basically humans have differences both physically

and psychically (Wakefield, et al., 2013).

To cover the weaknesses of traditional imagery, Holmes and Collins (2001) developed the PETTLEP imagery model. This model emerged based on the principle of functional equivalence where imagination in imagery should be as close as possible to the actual situation. Imagery that fits the motion is the one that has a kinesthetic sensation from one's point of view (internal). PETTLEP is a combination of components from: Physical, Environment, Timing, Task, Learning, Emotion, Perspective.

Physical requires imagery to be a physical activity such as sports (Holmes and Collins, 2001; Wakefield and Smith 2012). Bringing out kinesthetic sensations when doing imagery is a way for imagery and motion to be one. The kinesthetic sensations are helpful when studying a pattern of motion (Farahat, et al., 2004). For example, raising a kinesthetic sensation in the hand when imagining parry movement in karate and feeling the contracting leg muscles while doing the stances. In addition to kinesthetic sensations during imagery, it is also advisable to wear the same clothes and use objects that are related to the movement being imagined.

Environment refers to where the imagery takes place. The place of imagery should be made as similar as possible with where the exercise is performed. Video, audio and photos can be used as a tool to help imagine a place.

Task deals with a specific duty in accordance with the athlete's skill level, especially regarding the focus

and concentration. For example, beginner karateka are more focused to remember the *kata* motion while advanced karateka are focused on physical performance and technique (Bedon and Howard, 1992).

Timing is related to the time completion of the motion task. To get the equivalence of imagery and motion function, the speed of movement when imagining should be the same as the original movement (real time).

Learning is related to the adaptation of the content of the imagery toward the learning stages. The improvement of athletes' skills from week to week became the consideration of this concept. The imagery script in PETTLEP is changed every week to suit the level of the athletes' skill.

Emotion. In fact, competition sports is a physical activity that involves emotions. Therefore imagery must bring the same emotions with the actual sports situation. For example, sport targets or raises feelings of tension while competing.

Perspective in PETTLEP uses internal point of view. The internal point of view imagines the motion of our own eyes, whereas the external point of view illustrated as the athlete imagines seeing himself exercising. External point of view can be when athletes watching videos of themselves exercising. Callow, et al. (2013) proved that the internal point of view is better than the external point of view in motion imagery.

Based on the results of the study, the PETTLEP Imagery model has been tested to improve the performance of athletes in golf (Smith et al. 2008), netball (Wakefield and Smith, 2009), muscle strength (Wright and Smith, 2009) and volleyball (Afrouzeh et al. Therefore, PETTLEP imagery model should be tried on karate sports because the writers have not found any research on PETTLEP imagery model on karate.

Other than imagery models, the athlete's best performance is also determined by self-confidence (Vealey, 1986). There are two main models of confidence measurements in sport: self-efficacy and sport-confidence (Callow and Hardy, 2001; Thomas, et al., 2011). Self-efficacy is a form of self-confidence in a specific situation that is defined as "Belief's in one's capabilties to organize and execute the courses of action required to manage prospective situations." (Bandura, 1995, p.2). The concept of self-efficacy arises from the discipline of clinical psychology. Self-efficacy is not a confidence concept that is specific in sports, although it is already applied in sports.

Vealey (1986) developed the sport-confidence that provides a confidence concept that is specified to sports. Sport-confidence by Vealey (1986) "... as the belief or degree of certainty individuals possess about their ability to be successful in sport". Sport-confidence consists of two concepts: sport-confidence trait (SC-trait) and state sport-confidence (SC-state). Trait sport-confidence by Vealey (1986) "... as the belief or degree of certainty of the people possessing possess of their ability to be successful in sport". State sport-confidence by Vealey (1986) "... as the belief or degree of certainty individuals possess at one particular moment about their ability to be successful in sport". It can also be said that the level of confidence appropriate to the current situation of the sport and its nature is changeable.

The previous research revealed that sport confidence is associated with imagery (Moritz, et al 1996, Abma et al. 2002; Callow and Waters, 2005). Thus, the writers assumed that self-confidence in the sport greatly determines the performance of the karateka in doing the *kata* motion.

A more in-depth review need to be conducted regarding the application of PETTLEP imagery models compared to imagery relaxation by grouping the sample according to confidence level in high and low sports in advance.

2 METHOD

2.1 Participants

Forty beginners karateka with two-month experience of exercise. Derived from karate extracurricular of SMP Daarut Tauhiid Bandung with the age range from 13-14 years. All participants have never had any mental imagery training in sports before this.

2.2 Instruments

2.2.1 Sport Imagery Ability Questionnaire

The questionnaire is to obtain information from the athletes about the ability to produce imaginary shadows associated with sports. It consists of 15 questions using 7 Likert scales. In accordance with the previous research, if the sample is below the standard then the sample is not included in the study (Cumming and Williams, 2014).

2.2.2 Vealey Trait Sport Confidence Inventory (1986)

The questionnaire is to assess the level of confidence in the sport. It consists of 13 items of questions using

9 Likert scales. The value of 1 to answer the lowest confidence and 9 to answer the highest confidence.

2.2.3 WKF Kata and Kumite Competition Rules Revision 9.0.

The instrument in this research is a series of *kata* motion test based on the assessment criteria of WKF *Kata* and *Kumite* Competition Rules Revision 9.0. (2015). There are 3 main assessments of equal weight. Compatibility with original form and applicable standards, technical performance, and athletic performance. Each one has a weight of 1/3 rating.

2.4 Procedure

The samples worked on Sport Imagery Ability Quistionare, Trait Sport Confidence Inventory and Pretest karate.

Trait Sport Confidence Inventory results are used to divide the sample into a high and low confidence groups. To divide the high and low confidence used a median split method based on the results of the questionnaire sorted by the highest and lowest score then divides the two into high and low categories (Mills, et al. 2000).

The specified sample is divided into four groups based on the trait sport confidence inventory questionnaire, ie a) the group of high sport confidence students is given PETTLEP imagery (n = 10), b) the group of low sport confidence students is given PETTLEP Imagery (n = 10), c) the group of high sport confidence students is given Relaxation imagery (n = 10) and d) group of low sport confidence students are given Imagery Relaxation (n = 10).

Samples are requested not to conduct additional exercises outside of a predefined schedule. Based on literature references (Wakefield and Smith, 2009; Schuster, et al. 2011), the treatment in this study was given four times a week for 16 meetings. The imagery treatment is given at most 17 minutes. Both groups got imagery before physical exercise begins.

Imagery relaxation starts the imagery with relaxation and the script on imagery relaxation in the form of motion assignment and there was no change of script from the beginning to the end. The samples positions in this group sat quietly and relax.

PETTLEP imagery uses 7 elements (physical, environment, timing, task, learning, emotion, perspective). The position of the body stands and was instructed using a kinesthetic (physical) sensation from an internal point of view. The samples were also instructed to imagine the clothes worn like a karate

uniform and belt. The samples imagined themselves standing in the middle of the hall (environment) and felt the feeling when the all eyes are watching him doing the *kata* (emotion). The script was changed and adjusted to the ability of the sample (learning). The specific motion task consists of 21 motions and adjusted to the actual motion tempo (task, timing).

After 16 sessions, the samples performed a posttest of the *kata* karate. The data was analyzed using SPSS 23 and given conclusion.

3 RESULTS

The research data (*kata*) was analyzed by 2 ways anova and tukey with the help of SPSS 23. Here is the summary of the result of calculation in table 1:

Table 1: Data results.

Confidence (B)	Model Imagery (A)	
	PETTLEP	Imagery relaxation
High Confidence	49,6	34,7
Low Confidence	42,3	37,9
Average	45,9	36,3

Since the value of Sig. is smaller (<) than (0.040> 2.024), then H_0 is rejected and H_1 is accepted. So the research hypothesis stated: There is a significant difference between the PETTLEP imagery model and the imagery relaxation model received at the level of significance = 0.05.

Since the value of Sig. is larger (>) than (0.248> 0.05), then H_0 is accepted and H_1 is rejected. So the research hypothesis states: There is no interaction between 'model imagery' and 'confidence' to the skills of the word received at the level of significance = 0.05.

Because the value of Sig. is larger (>) than (0.108> 0.05), then H_0 is accepted and H_1 is rejected. So the research hypothesis states: There is no significant difference between the model PETTLEP imagery with imagery relaxation model in the group of high sport confidence received at the level of significance = 0.05

Because the value of Sig. is larger (>) than (0.905> 0.05), then H_0 is accepted and H_1 is rejected. So the hypothesis of research that states: There is no significant difference between the PETTLEP imagery model with the imagery relaxation model in the group of low sport confidence received at the level of significance = 0.05.

4 DISCUSSION

The PETTLEP imagery model is better than the imagery relaxation model toward the *kata* motion skill in karate. The results of this study filled the void of literature on PETTLEP imagery in karate *kata* motion while supporting the PETTLEP imagery theory which says that the imagination in PETTLEP is closer to the actual state of sport (equivalence of function) than imagery relaxation (Holmes and Collins, 2001).

Holmes and Collins (2001) says "We define motor imagery as a force generating representation of the self in action from a first person (internal) perspective (Jeannerod, 1997). The primary representational sense is kinesthesis". Kinesthetic sensations and internal point of view are the principal in sports imagery to get imaginations that are similar to the actual motion. Physical elements in PETTLEP require the position of the karateka to stand and feel each imagination by giving a kinesthetic sensation. In contrast to the imagery relaxation on which the relaxation was first given to the karateka and performed with a relaxed sitting position. The results of the research invisibly show the imagery relaxation group faced difficulty in determining the step and hand motion patterns of *kata*. For example, imagery relaxation groups made more mistakes than the PETTLEP group on motion 10 and 18 in *kata heian shodan*. This is due to the motions are rather complicated and require direct practice to learn. PETTLEP imagery imagines feeling the same muscle contraction as actual *kata* motion, making the imagination clearerthan just imagining while sitting relaxly.

The environment in PETTLEP gives the imagination of where *kata* takes place. The stimulus script and response prepositions were used to provide stimuli and something felt by the karateka when imagining (Lang, 1979). So when the karateka practiced *kata* in the actual place, they already feel familiar and not confused with *kata* step pattern (*embusen*). In contrast to the imagery relaxation group scripts that were not provided with the place to perform kata, some karateka were seen using places to memorize the *kata* motion. Therefore, when the place changes, the direction of the *embusen* became wrong.

Timing, Task and Learning were adjusted to the karateka's level of ability. The script at the initial meeting was made with slow-motion directives and detailed instructions. So the karateka can memorize every *kata* motion easily. The karateka in the second week seemed to have memorized the skill. To adjust the tempo (timing) of the imagery script, the details of the task direction were minimized and directions for quick motions were given. The script in the third week was made with short instructions to keep up with the tempo of *kata* motion and instruction to use speed and power to parry or hitting were added.

The emotion factor added in the PETTLEP script was in the form of self-confidence displaying the *kata* motion in front of his classmates. To display the *kata* motion well requires high confidence, because one of the judgments for *kata* is a facial expression that is a reflection of the karateka's emotional behaviour.

This study is in accordance with previous research which concluded that PETTLEP is better than imagery relaxation in improving sports performance (Afrouzeh, 2013; Wright and Smith, 2009; Smith et al. 2008).

The results showed the PETTLEP imagery model was better than the imagery relaxation toward karate's *kata* motion skill in the high confidence students group. Vealey (1986) stated that confidence "... as the belief or degree of certainty individuals possess about their ability to be successful in sport". This can be interpreted as a belief or a level of confidence a person has about his ability to succeed in sports. If the confidence is high, then the resulted sports performance will be high. Added with PETTLEP imagery supplements that provide more imaginative equality with real motion than the imagery relaxation.

The results are consistent with earlier research findings which found out that high confidence was better than low confidence in imagination abilities (Abma et al. 2002, Moritz et al., 1996).

The results showed that there were differences in average values between the PETTLEP imagery model and imagery relaxation in the high confidence group, but there was no difference in the average value between the PETTLEP imagery model and the imagery relaxation in the low confidence group. This is allegedly because the low confidence group lacks clarity of imagination in itself, as revealed by the results of the study Abma, et al. (2002) who found that confidence affects clarity when doing imagery. The higher the confidence the better imagination made, and vice versa. The results of this study prove the theory of Ahsen (1984) which stated that everyone has a different interpretation of meaning when given the direction of the same imagery script. This happens to high and low confidence groups who were given the same PETTLEP but have different effects. In addition, low confidence also affects the performance of the sport.

5 CONCLUSIONS

The PETTLEP imagery model is better than the imagery relaxation model toward karate's *kata* motion skills but the imagery model does not interact with the high and low level of sport confidence attached to the subject so it had no effect on the karate's *kata* motion skill, where the PETTLEP imagery model is better than imagery relaxation models in high sport confidence groups and low sport confidence groups.

Based on the results of research and conclusions that have been presented, the writers propose recommendations in the hope that it can be beneficial to all interested parties. The recommendations that the writers propose are as follows: For schools, to provide guidance on physical education teachers and karate coaches to provide imagery model supplements in learning physical education and sports in extracurricular so that learning objectives can be achieved. For karate coaches, to provide PETTLEP imagery supplements for learning purposes to be achieved. In addition, to look for prospective athletes by considering the personality such as confidence in order to find the best potential athletes in the future. For the students, to get maximum results from sports performance, physical and techniques training are required. Moreover, other than physical exercise, mental training is also required to be trained. For the next researchers, it is expected to develop the research and fill the void of literature that will add to the repertoire of sports science.

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