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Effects of Modeling and Imagery Type on Performance and Learning of the Volleyball Simple Serve

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Abstract. Imagery and modeling are similar cognitive processes that have been found to enhance performance. However, some imagery studies have shown a model of correct performance before beginning imagery to ensure that subjects are imagining the skill correctly; thus, confounding modeling and imagery. In a study that separated these factors, imagery type was not controlled. Therefore, the purpose of the present study was the comparison of the effect of modeling, internal imagery, and external imagery on performance and learning of volleyball simple serve using a pretest – posttest randomized – groups design. 48 novice female students with average imagery ability were randomly selected and matched in 4 groups based on self – efficacy (control, modeling, internal and external imagery). Data of from and result of performance were analyzed by 4*3 ANOVA with repeated measures of test factor and paired t test post hoc test. Results indicated that the result and from of performance of modeling group and after that internal imagery were significantly better than external imagery and control groups in last of acquisition, retention and transfer tests; but there were not significant differences between the from of performance of internal and external imagery groups in these tests. These findings suggest that modeling is more effective than internal and external imagery for individuals first learning a relatively simple, closed and discrete motor skill.

Key words: External imagery, Internal imagery, Learning, Modeling, Performance

1. Introduction

One of the aim purposes in the sport is that we learn easily skills through suitable training. In order to, scientists of movement behavior during years of researching and studies attempt to determine effective factors on performance and learning of skills. Undoable, one of the most important effective factors on learning process is observation skill or modeling; the observation skill is been "descried as one of the most methods important that people learn kinds of skills and behaviors"[2] . The observation skill is a cognitive process in which the learner attempts to imitate an observation action or skill performed that done by other people. This case to generate and develop a cognitive growth and that uses as a reference for composing performance, discovery and correcting of errors. Social cognitive theory is one of the theoretical approaches used to explain the modeling process [4]. this theory is on basis of this hypothesis that observer coded information about skills on symboling forms that are seen on the representation then learner uses coded information as guidance for future action[9]. On according to Bandura theory [3], modeling effective when is provided with 4 sub process. They included: 1- attention 2 – retention 3 – motoric reproductions 4- motivation .in the attention sub process, learner considered to skill out standing signs that make by model. In addition to, information storing is on the memory, what ever , observer could more modeling behavior as word or clear picture , the possibly of reminding is also more.learner should gain ability of necessary physical for producing modeling skill .finally , learner should be sufficient intention to considered oberservidy skill as model [22]. Bandura believed that learners should inform from consequncese observationof yourself behavior and also from consequences of other behavior observation . some of researchers believed that modeling is a effective method learning and movement skill performing[13]. Blandin and Proteau[19] concluded that observation of skillful and beginning model in developing mechanisms for determining. Error and correcting it are as effective as group of physical training. Deakin and Proteau [20] determined role of training programming on observed learning in their study . And they used of 3methods for learning. Exercise of modeling physical exercise, and mixed exercise. The results of

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this research are shown that group of 50% observing exercise acted as good as group of 100% body exercise. Findings of this research are suggested that more desirable action aquire only through interaction exercise and body training. Zetou and Tzetziz and Kioumourtzo and and Vernadakis[24]concluded that modeling has positive effect on acquiring two volleyball skill . Wulf and Pfeiffer[25]also observed meaningful difference between effect of representation on basis of student requirement and model repeatative representation to learner on learning of movement form in comparision with control group these two groups acted better as compare with control group. Weis[24] studed modeling effect on performance form and performance results he concluded that modeling has more effect , on learning of performance form as compared with performance result in children . In according to information procrssing, children cognitively have less priding. Therefore, cognitive faetors for growth movement should be considered on modeling process in children. Imagery is other one of understany process that has positive effect on performing and learning[4]. Imagery is required cognitive reviewing one physical skill without clearing physical movements. Bandura [1]recognized empowerment of memory movement traning on increasing skills learning and we faced with question that do memory traning has effect on cognitive of attention mechanism? Interestingly, Bandura suggested that symbolic produced on modeling behavior and use as internal models for producing answer and standards for correcting of answer. Landers [15]believed that imagery is mostly a visual experience. However Anderson [23]reminded that there are other senses and he defined imagery as: imagery is our notification of external sense and understanding experiences and whatever extend. For us on lacking of condition motives that have been determined for producing actual sence or actual understanding similarities. Theoretical theory that explained imaging effect on performance and learning is considered as symbolic learning theory [23]. This symbolic learning theory is suggested that learner produced a memory design from movement model as symbolic codes, that code on central nerve system[23]. We used of imaging or understanding signs during imagery to reminded local and temporal elements of skills[24]. learner reviwed these images and used of these information for guiding and improving skill physical performance many of researchers whit provide efficiency of imagery was a like modeling in comparison with kind of imagery white and hardy and open skills performing that need to anticipating and perception power for successful performancing internal imagery has considerable effect[24] . Substantially, researches have been shown that modeling and imagery are different and separating process. But many of researchers are expressed that modeling and imagery are exaety similar with together. Both of this process is included using of understanding signs, reviewing and perfomaring of skills. They are changed to underestanding image during information modeling that are been coded skill. A understand sign or image read from memory during imagery. Bandura[2] belived that modeling included reading of symbolic codes through imager He expressed that understanding process of imagery and modeling are similar both of modeling and imagery signs are been coded and reviewed before physical skill performing. However, imagery and modeling have similar processes, main difference is place of internal motivation. The imagery is understanding process that is contained internal reading of sense experiences that stored in memory and action performed without using of external stimulant. But criterion has been show through external stimulant during skill modeling in the patterning we used of model imaging representation tester provided a memory imaging from memory or before experiences as cassette or showing and has been obliged learner to produce them on the memory in imagery researches. Although, these processes really are similar but, modeling is needed to a external stimulant that mostly is been seen in nature and imagery isn't been organized with an external visual image. White and Hardy[6] belived that imagery and modeling are same from one side that people observed themselves or others from external aspect. modeling or observing exercise is as a kind of exercise that has effect on performing because, it is been considered as an aspect for next exercise and this internal images are been considered as internal criterion for producing answer (reply). Then it is reasonable that we considered modelin godeling and imagery as similar. But Kim and singer[13] expressed that modeling but in this research, modeling group is combined with visual imagery group. In the most of researches about imagery before starting imagery, we showed model of correct performing for new learner to assured of skill correcting. Therefore, effect of modeling and imagery were interchangeable. In a research, Soohoo, Takemoto, McCullagh[23] are seperated effect of modeling and imagery completely and are provided exercise of imagery without modeling. The result of this resewch are shown that modeling has more effect on perfoming and people on learning initial stage, intervention is effective. But in the research's Soohoo and et al, kind of imagery for participants hasn't been controlled. It is possible that kind of imagery has effect on effecting results therefore, the purpose of present research, comparision of modeling effect, internal and external imagery on, performing and learning of valleyball simple serve skill in beginner young girls.

2. Method

Participants

48 girls novice female students of Islamic Azad university in damghan Branch with age range between 18-24 and with average imagery ability (sport) are selected by chance a many 200 students that passed general physical training. Unit 1 in education second semi year 84-85 and they were completely on volleyball simple service skill. They considered basis of self- efficacy test grades, by chance in similar 4 groups: modeling, internal imagery external imagery and control. Participants expressed their acceptance for participating in research before starting of experimental period with signature of testimonial (letter of satisfaction) form.

Procedure and task

for performing of research we used of sport imagery questionnaires, Hall and Martin, physical self-efficacy scale, AAHPERD volleyball simple server performing result test ,and volleyball simple serve pattern assessment .

Scale sport imagery questionnaire

Exercise imagery of this test are designed from easy to diffical and each of exercise are been composed of clearing beginning situation memory exercise and action in the end of exercise we wanted every person grded degree of memory exercise easy or difficulty by a scale with seven values.

Physical self- efficacy scale

This scale consist of tow scale of understanding physical sport and physical ostentation assuration.They are 22 cases that are graded in scale with 6 values (1=completely opposite to 6= completely accepted).Expression 1,2,4,6,8,12,13,19,21,22 are been estimated understanding physical sport and expression 3,5,7,9,10,11,14,15,16.17.18.20.are been estimated physical osteritation first order expression are graded as mentioned above, and second order expression are valued as reverse order. Keronbakh Alpha coefficient and find coefficient with using of retest for physical self- efficacy was equal with 80% , 81%.

AAHPERD volleyball simple server performing resulting test

Volleyball area (land) is graded according to figure 1. participant should play (hit) 10 time serve.Score was been considerd zero when on serve time, person legs are placed on the line total scores were 10 as resulting scores.

<table>
<tr><td rowspan="3">3m</td><td rowspan="3">6m</td><td colspan="2">3 scores 1/5 m</td><td rowspan="3">4 scores

1/5 m</td></tr>
<tr><td>1 scores

4/5 m</td><td>2 scores

3 m</td></tr>
<tr><td colspan="2">3scores 1/5m</td></tr>
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Volleyball simple serve pattern estimated scale

This scale are estimates volleyball simple serve performing form. It was consisted of important features 3 stages of serve performing. (fitness , hit , moving continue).Every feature has one score and total scale has 10 scores. This scale is valued by several volleyball professionals.

3. Measures

First, imagery ability of particapants are measured by sport imagery questionnaires, Hall and Martin[11]. Then, we selected 48 novice female students by chance of among participations that have averge imagery ability imagery for self efficacy variable control, first we measured participant self- efficacy with using of physical self – efficacy scale[23] and then in basis of acquired score , we unified modeling, external and internal imagery and control group by chance. Tow days ago of teaching beginning and experimental period, external and internal imagery groups have done primary exercises on skill except volleyball simple serve. verbal training of volleyball simple serve (without skill showing) equally are provided to 4 groups. We passed off an pre-test for all of groups. This was composed of 10 volleyball simple serve performing from area (land) right side semi-length results of 10 serve performing are measured by AAHPERD test. In addition to, we were film taking of participants when they were performing 10 serves.And three professionals graded performing shape on basis of scale. Score average of these 3 professionals are considers

as performing form score. modeling group observed 10 times film of a skillful group. Internal and external imagery group imaged serve skill with coach voice 15 times as internal and external. We provided yoga exercise to control group immediately, after and of exercises that lasted 45 minutes, we passed off test for 4 groups that composed of 10 serve performing from land right side semi- length. And then are estimated performing form and result after 60 minutes interval that all of groups trained yoga, (for preventing of physical and memory exercise) test is dune and it is comped of 10 serve performing from land right side semi length then transfer test is composed of 10 serve performing from land left side of semi- length.

4. Statistical analyses

For summarizing and classifying of gathering Data , was used of described statistic it was composed some of central tendency indexs and dispertion. And for zero assumptions test is used of conclusion statistic, it was composed of two factor variance analyses 4×3 ANOVA with repeated measures of test factor and paired test post hoe test.

5. Result

Figure 2 is shown average of resulting score on volleyball simple serve performing for experimental and control groups in pre –test end of acquired stage and test and transfer as we see in the figure, average of internal imagery and patterning score in end of acquired stage, test and transfer are better than other groups and control group has the weakest score in all test and daring experimental period don't have any advance. After naturalizing pre-assumption test of depencc variable dispersion in different levels of using of kolmogorov- simirnov test(P>0/05) and differences variance uniformity pre-assumption with using of movcholi variance analyses test(P>0/05) is done with repeated measures of test for depence variable of performing resut. Results of this test are shown that main effect of group and test has meaning(P>0.001).

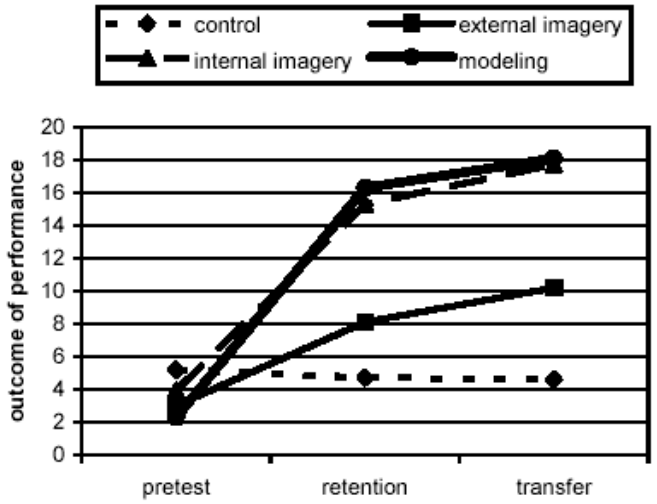

Fig. 2. The performance of the experimental and control groups in pretest, retention and transfer tests.

Results of paired test post hoe test depence to correction has shown that in pre- assumption don't have main difference between groups performing results(P>0/05).And score in each of 3 exprimental groups on acquired, retention and transfer test was better, than pre- test. In test of acquisition stage, modeling group was better than external imagery and control and internal imagery group was better than control group. And retention and transfer test , difference for all groups except internal and external imagery group have meaning full(P>0/001).

6. Discussion

The purpose discussion and conclusion of this research were comparision of modeling, internal and external imagery effect on performing and learning of volleyball simple serve skill in novice young girls. in the some of imagery researches, the results were influenced other interventions such as modeling and acquired different results.In this research, intervention of modeling and type of imagery used separetly on

performing and learning. Results of this research have shown that scores of performing form and result group modeling on retention and transfer test were better than pre-test. These results were conformed with most researches of Mccullagh and Weiss[22] about facilitated effect of modeling on movement skills performing and learning. modeling cause to make and develop a recognitive regrowth. It was used as refrence for performing comparision, error correcting and discovering these findings that modeling can be facilated skill acquired especially on learning early stages and its profits were cleared completely on moving patterns production and it was conformed with results of this reseach, and Bandura social cognitive learning theory.This theory was basic of many researches about movement learning. And it seemed that learning needed some of generall movement or behavior forms that learned in observe situation. Also, in many researches were concluded that observing of a model in learning or advancement cause to learn timing of relative skill[23] . This experienced design was produced similar effect in physical training and sensy information during patterning exercise. Incarnating or visual memory had important especially on growth early stages. Because in the stage, speech skills weren't developed well[22]. Also, in movement skills were need to harmony, spatial organization and skill were shown hardly as speech (wordy) therefore, swing movement of Golf stick can be incarnated better than it was descried as speech.In according to results, form scores and (internal, external) imagery groups performing results in acquiring , and transfer tests were better than pre- test[6] .These findings were conformed with most of finding's Driskell and et all, Hall, Martin and et al about imagery effect on learning of movement skills[6]. Hall has expressed that a variable imagery abiltly (sport) was individual. And success surpassed memory training[22].Then people with high imagery abilty (sport) can be profited more from memory traing of moving skills. In addition to modeling and then internal imagery were most effective of cognative methods on learning and performing form and resulting. The results of this research was conformed with mack kall results about modeling effect on performing form he concluded that patterning was effective on learning of performing form in weight- lifting skill. But on performing form learning[22].There weren't important (meaning full) difference between internal and external imagery[8]. Then we can recommended to coaches and athletes that used of internal and external aspects in readlity, changing from a imagery aspect to other aspect was use full on imagery skill evolution.Being more effective of patterning group than other groups in acquisition, retention and transfer of a movement skill were conformed with results of Sohoo and et al, Fischman and Oxendine[8] . They believed that visual information are needed for learners on learning understanding stages but with findings of Kim and Singer weren't conformed[21].Sohoo but et al mentioned in their research, it was possible that imagery was more effective than patterning on performing and learning of a movement skill[9]. This case was about intervention of imagery and patterning effect in this research. Also, in some of researches effect of patterning and imagery are similar[7]. There fore, internal imagery was used on patterning and imagery, can produced[8] .Some effects Kim and Singer [21]in their research correcting movement have shown pattern of to participants before imagery(for effective using) and they suggested that we needed to before imagery for imaging[8]. Imagery group without learning on imagery before acquisition test were more in effective in performing than patterning group. When pattern presentation was deleted before imagery in Sohoo and et al, research, we acquired completely different results.This results are conformed with present research results[22].Internal imagery group on performing form and conclusion was better than external imagery group in acquisition and ,retention and transfer stages. These were conformed with finding of white and Hardly [12], Hardly and et al. in this research, internal imagery effectives attributed to exercise nature[13]. And they concluded that for performing and learning of open skills that were needed to anticipating and understanding power, internal imagery has considerable effect. In general , finding of this research have shown that on learning initial stages for a relatively closed , simple movement skill such as volleyball simple serve, modeing was more effective than internal and external imagery . effect of these factors on other kinds of movement skills such as open and continued halters learning were need more researches.

7. References

[1] Bandura, A. *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall, 1986.

[2] Bandura, A. *Social learning theory*. Englewood cliffs, NJ: Prentice Hall, 1977.

[3] Baumgartner, T. D., &Jackson, A. S. *Handbook measurement for evaluation in physical education and exercise science.* New York: Human Kinetics, 1991.

[4] Baumgartner, T. D. & Jackson, A. S. *Handbook measurement for evaluation in physical education and exercise science.* New York: Human Kinetics, 1991.

[5] Corbin, C. B. The effects of convert rehearsal on the development of acomplex motor skill. *Journal of General Psychology*. 1967, **76**: 143-150.

[6] Driskell, J. E., Copper, C., & Moran, A. Does mental practice enhanceperformance? *Journal of Applied Psychology*. 1994, **79**: 481-491.

[7] Finke, R. A. *Principles of mental imagery*. Cambridge, MA: MIT Press, 1989.

[8] 8. Fischman, M. G., & Oxendine, J. B. Motor skill learning for effectivecoaching and performance. In J. M. Williams (Ed). *Applied SportPsychology: Personal Growth to Peak Performance* (3rd ed). Mountain view, CA: Mayfield. 1998, pp. 14-15

[9] Gray, S. W. Effects of visuomotor rehearsal with videotaped modeling on racquetball performance of beginner players. *Perceptual and Motor Skills*. 1990, **70**: 379-385.

[10] Hall, C. R., & Martin, K. A. Measuring movement imagery abilities: Arevision of the Movement Imagery Questionaire. *Journal of Mental Imagery.* 1997, **21**: 143-154.

[11] Hall, E. G., & Erffmeyer, E. S. The effect of visuo-motor behaviorrehearsal with video-taped modeling on free throw accuracy of intercollegiatefemale basketball players. *Journal of Sport Psychology.* 1983, **5**: 343-3462.

[12] Hall , C. R. *Imagery in sport and exercise . in R. N. singer, H. A.Hasenblaus, & C. M. Janelle (Eds), Hand book of research on sport*, 2001.

[13] Li-Wei, Z., Qi-Wei, M., Orlick, T., & Zitzelsberger, L. The effect ofmental imagery training on performance enhancement with 7-10-year-oldchildren. *The Sport Psychologist.* 1992, **6**: 230-241.

[14] 15. Landers, D.M.. Observational learning of a mtor skill :temporal spacing of demonstratins and audience presence .*Jurnal of motor Behavior*. 1975, **7**: 281-287

[15] 16. McCullagh, P., & Ram, N. A comparison of imagery and modeling. *Journal of Sport & Exercise Psychology.* 2000, **22**(Suppl. 1): 9.

[16] McCullagh, P., Weiss, M. R., & Ross, D. Modeling considerations inmotor skill acquisition and performance: An integrated approach. In K. B.Pandolf (Ed). *Exercise and sport science reviews.* Baltimore:Williams & Wilkins. 1989, pp. 475-513.

[17] Martin , K. A., Moritz, S. E., & Hall, C. R. Imagery Use in sport:Aliterature review and applied model. *The sport psychologist.* 1999, **13**: 245-268.

[18] McCullagh, P. & Weiss, M. R. *Modeling: Considerations for motor skillperformance and psychological responses.* In R.N. , 2001.

[19] Murphy , S.M. Imagery interventions in sport . *Medicine and Science in sport and Exercise*. 1994, **26**,486-494.

[20] Richardson, A. *Mental imagery*. New York: Springer. Psychology, New York: John wiley & sons. 1969, pp. 529-549.

[21] Singer, H.A. Hasenblaus, &C. M. Janelle (Eds.). *Handbook of research on sport psychology*. New York: Wiley & Sons, pp. 205-238.

[22] Soohoo, S., Takemoto, K. Y. & McCullagh, P. A comparison of modelingand imagery on the proformance of motor skill. *Journal of Sport Behavior.* 2004, **27**(4): 349-66.

[23] Ryckman, R. M., Robbins, M. A., Thornton, B., & Cantrell, P. Development and validation of a physical self – Efficacy scale. *Journal ofpersonality and social psychology.* 1982, **42**: 891-900.

[24] Weiss , M.R.,McCullagh , P., Smith,.A. Observational learning and the fearful child: influence of peer models on swimming skill performance and psychological responses. *Research Quarterly for exercise and sports*. 1998, **69** : 380-394

[25] Woolfolk.R.L., Murphy, S.M., Gottesfeld, D., & Aitken, D. Effects of mental rehearsal of task motor activity and mental depiction of task outcome on motor skill performance. *Journal of Sport Phychology.* 1985, **7**: 191-197.