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Effects of different variations of mental and physical practice on sport skill learning in adolescents with mental retardation

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ABSTRACT

The purpose of this study was to investigate the effect of five variations of imagery and physical practice on learning of Basketball free throws in adolescents with mental retardation (AWMR). Forty AWMR were randomly assigned to five groups and performed a variation of practice: physical practice, mental practice, physical practice followed by mental practice, mental practice followed by physical practice, and no practice. The groups exercised the task for 24 sessions. Following training, posttest and retention test were taken. All variations of practice resulted in performance improvement, yet the mental practice followed by physical practice resulted in better improvement. The results suggest that mental practice associated with physical practice results in an outstanding performance improvement in AWMR.

It has been shown that mental practice has a notably positive effect on learning motor tasks in healthy individuals. Literature reviews (Clark, 1960; Driskell, Copper, & Moran, 1994; Feltz & Landers, 1983; Grouios, 1992; Hinshaw, 1991) indicate that mental practice is more effective than no practice, but not as effective as physical practice. Mental practice techniques are used to supplement physical practice and facilitate motor skill acquisition (Feltz & Landers, 1983). Some studies reveal that mental practice promotes figure skating (Palmer, 1992) and trampoline (Isaac, 1992) performance. In a study, however, imaginary practice has not promoted the performance of a motor task to the same extent as physical practice of that skill. Yet, it does usually produce better performance to that of a control condition (Hall,

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Buckloz, & Fishburne, 1992). In an intriguing study (Hird, Landers, Thomas, & Horan, 1991), mental practice was found to have a more profound effect on tasks having a large cognitive component.

The most important reason for the effectiveness of mental practice in motor skill acquisition is that motor imagery and movement preparation similarly activate sensorimotor structures of the human brain (Jeannerod, 1994). To see whether mental practice has positive effect on learning motor skills, a large number of studies have been conducted and the results are almost equivocal (for a review see Feltz & Landers, 1983).

The above studies provide support for the hypothesis that imaginary practice, physical practice, and different combination of physical-imaginary practice result in motor task improvements in mentally healthy persons.

Studies about the effectiveness of mental imagery on motor task learning in mentally retarded individuals are rare.

Porretta and Surburg (1995) examined the effect of imagery practice in conjunction with physical practice on the performance of anticipating a coincidence (striking) in mentally retarded adolescents. They randomly assigned 32 adolescents to either a physical practice plus imagery practice group or a physical practice only group. The physical practice in conjunction with mental imagery resulted in significantly greater performance accuracy and less performance variability.

Surburg (1991) explored the use of imagery practice to facilitate the preparation of adolescents with mild mental retardation to perform a motor task was. In this study, 32 mentally retarded individuals and 32 persons without retardation performed a response-type task that included reaction time and movement time components. Catch trials were used to manipulate the preparation levels of several experimental groups. It was demonstrated that imagery practice facilitated the execution of the reaction time and movement time.

Zupnick and Meyer (1975) investigated the effects of imagery instructions on paired-associate learning efficiency and on the retention of 16 picture pairs using two groups of educable mentally retarded individuals. It was found that imagery instructions facilitated list mastery, but no facilitation was found for 1-week retention performance. However, in learning a new list immediately following the retention task, those individuals who had experienced imagery instructions during original learning exhibited facilitated learning. These results extend previous work.

Very few researches have used mental imagery to show if it results in better motor task learning in mentally retarded persons. The purpose of this study was to examine if mental imagery combined with physical practice would increase the rate of learning of a sport skill in comparison to physical practice alone and mental imagery alone in trainable mentally retarded adolescents. The experimental design chosen for this study was a five grouped matched pretest–posttest–retention test design, with each group performing a variation of practice: physical practice only, mental practice only, physical practice followed by mental practice, mental practice followed by physical practice, and no imagery–no physical practice.

1. Method

1.1. Participants

Sixty-four trainable mentally retarded students from a mentally retarded school of Tehran (aged from 12 to 15 years) volunteered to take part in our experiment, but 40 students were considered as normal imagers, so we recruited them in the study. They took part in the experiment after their scheduled class. All of the children were right-handed (according to self-reports) and inexperienced at the experimental task. All participants were in reasonably good health and physical condition. Participants were randomly assigned to one of five groups: four experimental and one control (8 participants per group). The Committee for Ethical Considerations in Human Experimentation of University of Tehran assessed and approved the experimental protocol.

1.2. The experimental task

We chose the basketball free throw as the experimental task. It has relatively high imagery values. Free throw is an unguarded shot taken from the foul line by a player. Foul line is the line 15 in. from the