

The Effect of Cognitive and Motivational Imagery on Choice Reaction Time

¹Hassan Alikhani and ²Mohammad Vaez Mousavi and ³Pouneh Mokhtari

¹Department of Physical Education and Sport Science,
Science and Research Branch, Islamic Azad University, Tehran, Iran

²Imam Hossein University, Tehran, Iran

³Islamic Azad University, Central Tehran Branch, Tehran, Iran

Abstract: The purpose of the present study was to compare cognitive and motivational imagery effects on choice reaction time. Participants (n=45; mean age: 22/5) was assigned in 3 groups of control, cognitive imagery and motivational imagery based on movement imagery and sport imagery questionnaires by matching. Empirical groups after perfect made mental imagery according to their special frame work for 14 days and there look part in computer testing of reaction time. One way variance analysis in retention test shows the dominance of imagery group to comfort group but there is no difference between imageries. The findings show that cognitive and motivational imagery can affect function by different performances.

Key words: Cognitive imagery • Motivational imagery • Choice reaction time • Retention • Sport imagery • movement imagery

INTRODUCTION

In some daily activities specially in sport activities suitable response to stimulus with quick reactions is necessary. In many sports fields such as rapid running a short time reaction can lead to championship while it is longer it leads to failure. So researchers are seeking for ways to make reaction time rapid. Reaction time means the time distance between presentation of unexpected stimulus until the start of response. It includes 3 stages of information processing, stimulus identification and response selection and response programing [1] the speed of reaction time depends on 3 main variables: a) stimulus variables such as clarity and intensity of stimulus b) response variables the features of a good response c) individual variables such as practice time, the level of arousal and ... [2], in many matches stimulus and response variables are same for all athletes so it is important to effect individual variables on reaction time. It is so dear that individual variables are controllable to large extent and with the effect on this we can accelerate reaction time. There are little researchers in this field such as Norri (1967), Mow bray (1960). Doing successful skill depends on exact decision making before starting movement. It seems that using mental paretic especially in mental imagery can reduce reaction time because it

happened during reaction time and needs mental processing. Researchers believe that mental practice and imagery can reduce reaction time by meaning full link and effective relation between stimulus and response by forming comparative memory and selection of suitable response [3].

Mental imagery is semi-sensitive knowing and semi-cognitive experience in situation that the stimulus doesn't have cognitive and sensitive experience[4]. Mental imagery is a kind of mental practice that has important role in learning of motor skill, reviewing especial skill, improving self confidence, anxiety control and motivation [5]. Pavio (1985) in explaining the relationship of mental imagery with performance and learning focuses on cognitive and motivational role of mental imagery [6]. Cognitive role of mental imagery has a relationship with cognitive variable learning while motivational role of mental imagery has relationship with motivational variable such as arousal and activation. Different presented theories in mental imagery shows the effect of mental imagery based on hair own views for example saket example learning theory (1934) that has a cognitive view toward mental imagery implies that there is a relationship between learning by mental imagery and learning by cognitive imagery and refers to understanding of movement example.

This theory believes that mental imagery gives the performer Has chance that to practice movement consequences as an example parameters in other words mental practice can make encoding necessary movement for doing ability in mind and making movement program in control nervous system. With encoding movements in mind we can boost movement ability. Lang (1984) supports motivational effects of mental imagery by the help of motivational views of mental imagery such as Bioin for motional of motivational of information processing theory. Motivational views of imagery focuses on emotional elements in making effective relationship between stimulus and response.

Previous researches in contrasting effectiveness of cognitive and motivational mental imagery have reacted to different results, as some studies show the effectiveness of cognitive imagery. In this field we can refer to researches such as Blair, Hall (1993) and Cuming *et al.* (2001) while in other studies such as Felts and Riessing (1990) and Lee *et al.* (1990) motivational imagery is so suitable for improving performance and learning [7-10]. Here are a little researches on the effect of imagery on reaction time. Such as Schmith (2005) that implies that imagery can effect reaction time based on cognitive effect [11]. Since the reaction time is important part of many skills and affect rate of cognitive and motivational ingredient on reaction time not detected. It seems may detected affect of said ingredient by the comparison of motivational and cognitive imagery. Thus use the appropriate imagery for creation of short reaction time.

MATERIALS AND METHODS

Participants: 45 male volunteer right hard students age 18-25, (average 22/5, standard deviation 2.98) participated in this study all of them are studying physical training in Lahijan Azad University and have natural eye sight or modified eye sight (with glasses) there isn't any movement and auditory problem and they were completely novice in this task.

Information Gathering Instrument

In this Research We Use These Instruments:

- Hall and Martin (1997) movement imagery questioner with 8 questions with two sub visual categories and movement sense.
- Hall and Martin (1998) sport imagery questioner with 30 questions in 5 sub cognitive categories (general and especially) and motivational category (general and especially) [12].

- Reaction time software which can record o/ool second this soft ware designed by computer expert.

Information Gathering Method: We use sport and movement imagery questioner for deleting persons without imagery ability after filling individual information form and measuring body features such as height and weight. Then statistical example are selected and placed in motivational and cognitive imagery groups and control groups based on questioner result and by the help of matching.

Pre-testing was done by forty trials for all groups. Participants in acquisition stage have done mental imagery work in choice reaction time according to especial way for 14 days based on (Pavio, 1985; Martin, 1998; Munroe, 2000) helps. cognitive imagery group makes images by work performance details and motivational imagery group makes image by emotions according to instructions.

It is done by both groups with an editor tape and by this participants at first warm up mentally by Hickman method and after that make especial imagery with 40 trials- in retention stage 48 hours after acquisition, persons have done 40 trials and the time of reaction recorded in 1000th of second.

Information Analysis Method: Descriptive statistics method was used for mode, means standard deviation and inferential statistics method was used for theories examination. One way Analysis of Variance, were used for this reason.

Findings: The comparison of pre-test scores; after dividing participants in 3 groups, their pre-test scores were compared (Table 1).

The result of variance analysis in reaction time pre-test doesn't show a meaningful difference in 3 groups.

Retention Test: The one way Analysis of Variance results in reaction time retention test shows a meaningful difference between groups (Table 2).

Toki test determines the difference point of groups in reaction time retention test (Table 3). It shows that the reaction time motivational and cognitive imagery groups is shorter than control group meaningful; it means that, imagery whether cognitive or motivational makes reaction time shorter while the reaction time of motivational and cognitive groups doesn't differ meaningfully.

Table 1: The results of one way Analysis of Variance in Pretest

	Sum of Squares	df	Mean Square	F	Sig
Between Groups	0.084	2	0.042	0.178	0.837
Within Groups	9.180	39	0.235		
Total	9.264	41			

*Difference at 0.05 level is meaningful

Table 2: The results of one way Analysis of Variance in retention test

	Sum of Squares	df	Mean Square	F	Sig
Between Groups	1.468	2	0.734	7.974	0.001
Within Groups	3.590	39	0.092		
Total	5.058	41			

*Difference at 0.05 level is meaningful

Table 3: The result of Tukey test over retention average scores of studying groups

	Cognitive imagery	Motivational imagery	Control
Cognitive imagery	-	-0.0152	-0.4039 *
Motivational imagery	0.0152	-	-0.3887 *
Control	0.4039	0.3887 *	-

*Difference at 0.05 level is meaningful

RESULT AND DISCUSSION

Research findings show that groups regardless to motivation and cognitive are dominant in retention test to control groups. The results are in harmony with the findings of Murdock (1974), Weinberg and Jackson (1980), Weinberg and Jackson (1983), Ryan and Simons (1983), Burhance (1988), we in berg, Risberg and Enshel (1986), Kolonay (1997), Murphy (1998), Coming (2001), Short (2002); that all focus on the positive effect on practice and imagery on performance [13-20].

Researchers mentioned the help to problem solving process in early learning stage and individual preparation for performance and also help for doing better learned skill to explain the effectiveness reasons imagery. The other mentioned reason is that persons can mix the feathers of both acquisition and performance position by mental practice; and finally make storage so easy in memory and also is retention.

The other finding of the present study shows that motivational and cognitive imagery groups have no meaningful difference in retention test. This research in this regard is in harmony with Lee (1990), Salomon (1994). Murphy (1998) Burhance (1998), Short (2007) show no difference between these two imagery.

The results of Lee (1990), Hall (1998) and Cumming (2001) were different, they distinguished cognitive imagery more effective; in the other hand, the present study results are different from Barr and

Hall (1992), Salamon (1994); they distinguish motivational imagery more effective. It seems that in the comparison of the effect of cognitive and motivational imagery, the type of practice has more importance. In various researches with different findings with the present research; it was obvious that the investigated practices and abilities are affected by one factor successive.

Hence the investigation and comparison of cognitive and motivational imagery regarding practice type need more consideration. As the reaction time is between the starting of stimulus and starting of response, the effective factors that effect mental process for selecting a suitable response and accelerating decision making are so important reaction time includes two stages of pre-movement and movement stages. The pre-movement stage is the measuring element of receiving and transfer information from environment to muscle by nervous system. It sounds that this time distance is a measure of cognitive and perceptual activity in decision making and person comes to this at the moment of movement preparation.

Cognitive imagery helps to reduce this stage by making effective relation between stimulus and response. Donders (1969) divided reaction time to 3 stages, including stimulus identification and response selection and response programming. It is believed that cognitive imagery effects on response selection and programming stages.

Both the memory comparison and the response selection processes heavily depend on encoding, storage and retrieval operations (Baddely 1976, Glass and Hollyoak 1986, Murdock 1974) [21]. These operations are largely influenced by the manner in which material is mentally organized (Anderson, 1985; Begg, 1983; Marttin, 1983) [22, 23]. It sounds that cognitive imagery facilitates RT by constructing a super ordinate context which coheres associations and establishes meaningful connection, or, effective relationship between stimuli and responses. Hence the creation of an additional degree of memory organization which in turn through direct influence on encoding, storage and retrieval operations comparison memory and response selection processes more efficient (Grouios, 1988).

In the other hand, as Schmith told in the practices that need more decision making process and less movement, the motivation rate and activation effect performance [11]. Reaction time tasks are those that effected by emotional factors as activation because of the importance of speed and accuracy in decision making and response. it sounds that motivational imagery can effect improving reaction time on emotional factors. Magil (2004) also mentioned the motivation is as an effective factor on allocation of resources attention [24].

In reaction time task, the stimulus should be determined by enough speed and accuracy for making a fast and suitable response motivational imagery by improving arousal rate can help to this process. Additionally, according to long idea, this kind of imagery improves performance because of impacting of response factor. It means that if it determines response factor by background factors as shape and color and also by emotional and motivational factors, it will strengthen the stimulus and response relationship. and finally increase learning. By the long idea, making an image of these emotions and feelings has a crucial role in effective relationship of stimulus and response.

In brief; both cognitive and imagery mental imagery are effective in reaction time task learning; while in other tasks and skills with various ability levels, the performer in one kind imagery has a prominent performance regarding others. Hence it seems that all factors should be taken into account according to the kind of tasks, it matching position and all emotional factors as the presence of fans in addition to performer skill level.

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