

A study on variation of Reaction time with respect to playing positions of Football players

Tara Singh Thakur^{1*} & P.Madhusudhana Babu²

¹*Asso.Professor in Physical Education, Anurag Group of Institutions, Hyderabad.*

²*Lecturer, Rayalaseema College of Physical Education, Proddatur, Andhra Pradesh.*

Abstract: *In the present study an attempt has been made to study the variation of three forms of visual & auditory reaction times namely i) Simple reaction time ii) Discriminative reaction time and iii) Choice reaction time of Football players with respect to their field playing positions. For this purpose Football players of various engineering colleges of Hyderabad were classified into four categories namely a) Goal Keepers b) Defenders c) Midfielders and d) Forwards. A Simple Reaction Time Apparatus was the tool used to measure the auditory and visual reaction times of the subjects. The study was conducted on 20 Goalkeepers and 50 subjects in each other categories. The study concludes that visual reaction time varies with respect to playing positions of Football players whereas the auditory reaction time has no significant variation.*

Key Words: *Reaction time, Field Positions, Reaction time Apparatus.*

I. Reaction Time

Reaction time is duration between applications of a stimulus to onset of response. Reaction time acts as a reliable indicator of rate of processing of sensory stimuli by central nervous system and its execution in the form of motor response. Reaction time can be described into three types, (1) Simple reaction time: - here there is one stimulus and one response. (2) Recognition reaction time: - here there are some stimuli that should be responded to and other that should not get response. (3) Choice reaction time: - here there are multiple stimulus and multiple responses. Reaction time, reflexes, quickness, or whatever the response is called, is a complex function that includes mental, physical, innate, and learned components. There will always be individual differences, but each athlete can learn to improve reaction time. We have to be sure the athlete can take the stimulus - whether it's verbal, visual, tactile, or in some other form - and turn it into a response. A person can have great reaction time, but it doesn't help if his or her body can't do anything about the stimulus. If a football player doesn't have basic motor abilities, he won't pick them up just playing football. If track athletes can become quicker through experience and anticipation, so can competitors in other sports. It's even more valuable if they practice reaction time in the context of game situations in their respective sports. Here are some examples:

- Reaction drills for receivers in football
- Wave drills and one-on-one drills in basketball
- Rapid-fire volley drills and service return drills for tennis players
- Drills in which football linemen drop to the ground and return to a standing position
- One-on-one defensive drills, face-off drills, and short-range goal-defending drills in soccer.

There are three take-home ideas here. The first is to develop ways to do something with your body to react to a stimulus. The second is to develop basic motor skills that are needed to play a sport. The third is to incorporate both components into competitive situations.

Football Playing Positions: In the sport of football, each of the eleven players on a team is assigned to a particular position on the field of play. A team is made up of one goalkeeper and ten outfield players who fill various defensive, midfield and attacking positions depending on the formation deployed. These positions describe both the player's main role and their area of operation on the pitch. Following are the position of play in Football.

1 Goalkeeper (GK)

2 Defender (DF): i) Centre-back (CB), ii) Sweeper (SW), iii) Left-back (LB) and Right-back (RB), iv) Left wing-back (LWB) and Right wing-back (RWB).

3 Midfielder (MF) : i) Centre midfield (CM), ii) Defensive midfield (DM), iii) Attacking midfield (AM), iv) Wide midfield (LM) and (RM).

4 Forward (FW) : i) Centre forward (CF), ii) Second striker (SS), iii) Left Wing (LW) and iv) Right Wing (RW).

Sample: 170 Football players from various engineering colleges in the age group of 18- 21 years and pursuing graduation have been taken as the subjects for this study. The only criteria set up for consideration of the sample was that the players must have been playing the game for at least past five years. 50 players in each category namely Defenders, Midfielders and Forward along with 20 Goal Keepers have been chosen for the present study.

II. Material and Methods

Reaction Time Apparatus can be used to measure pure reaction time and simple, discriminative and choice reaction / movement times. You can also use two or more of these units together to demonstrate how reaction time increases as a function of the number of stimulus-response alternatives in a task. Each unit is equipped with two, color stimulus lamps (red and green), one tone (auditory) stimulus, and two response keys. 15 feet of cable and a shield at the console separate the operator from the subject.

All the subjects were provided with thorough knowledge about this apparatus and the procedure of testing their Simple Reaction time, Discriminative Reaction time and Choice Reaction time. Data was collected from all the 170 players and tabulated for analysis and compared among four categories.

Data Analysis:

Table: 1 Comparative table of Simple Visual Reaction Times of Football players with respect to their field positions.

| Sl.No | Group | n | Mean ± Sd |
|-------|--------------|----|---------------|
| 1 | Goal Keepers | 20 | 0.229 ± 0.030 |
| 2 | Defenders | 50 | 0.251 ± 0.037 |
| 3 | Midfielders | 50 | 0.252 ± 0.036 |
| 4 | Forwards | 50 | 0.248 ± 0.029 |

Table: 2 Comparative table of Discriminative Visual Reaction Times of Football players with respect to their field positions.

| Sl.No | Group | n | Mean ± Sd |
|-------|--------------|----|---------------|
| 1 | Goal Keepers | 20 | 0.276 ± 0.055 |
| 2 | Defenders | 50 | 0.283 ± 0.063 |
| 3 | Midfielders | 50 | 0.288 ± 0.015 |
| 4 | Forwards | 50 | 0.297 ± 0.022 |

Table: 3 Comparative table of Choice Visual Reaction Times of Football players with respect to their field positions.

| Sl.No | Group | n | Mean ± Sd |
|-------|--------------|----|---------------|
| 1 | Goal Keepers | 20 | 0.287 ± 0.047 |
| 2 | Defenders | 50 | 0.303 ± 0.058 |
| 3 | Midfielders | 50 | 0.308 ± 0.048 |
| 4 | Forwards | 50 | 0.300 ± 0.076 |

Table: 4 Comparative table of Simple Auditory Reaction Times of Football players with respect to their field positions.

| Sl.No | Group | n | Mean ± Sd |
|-------|--------------|----|---------------|
| 1 | Goal Keepers | 20 | 0.294 ± 0.015 |
| 2 | Defenders | 50 | 0.303 ± 0.023 |
| 3 | Midfielders | 50 | 0.297 ± 0.047 |
| 4 | Forwards | 50 | 0.292 ± 0.034 |

Table: 5 Comparative table of Discriminative Auditory Reaction Times of Football players with respect to their field positions.

| Sl.No | Group | n | Mean ± Sd |
|-------|--------------|----|---------------|
| 1 | Goal Keepers | 20 | 0.311 ± 0.016 |
| 2 | Defenders | 50 | 0.332 ± 0.076 |
| 3 | Midfielders | 50 | 0.319 ± 0.038 |
| 4 | Forwards | 50 | 0.322 ± 0.049 |

Table: 6 Comparative table of Choice Auditory Reaction Times of Football players with respect to their field positions.

| Si.No | Group | n | Mean ± Sd |
|-------|--------------|----|---------------|
| 1 | Goal Keepers | 20 | 0.389 ± 0.055 |
| 2 | Defenders | 50 | 0.391 ± 0.067 |
| 3 | Midfielders | 50 | 0.401 ± 0.078 |
| 4 | Forwards | 50 | 0.386 ± 0.086 |

III. Findings:

After thorough analysis of the above tables illustrating the mean values of visual and auditory reaction times of Football players in various playing positions, it was found that the auditory reaction time in all the four category of players i.e. Goal Keepers, Defenders, Midfielders and Forwards has no significant variance from each other whereas the Simple Visual Reaction Time (SVRT) of Goal Keepers (0.229) was found significantly better than the players in other three positions(>0.247). Hence this study reveals that Goal Keepers have a better visual reaction time when compared to other field players whereas the auditory reaction time has no significant difference with respect to field positions.

IV. Discussions and Conclusions:

The aim of this study was to study the variation of three forms of visual & auditory reaction times namely i) Simple reaction time ii) Discriminative reaction time and iii) Choice reaction time of Football players with respect to their field playing positions. It was found that the auditory reaction time in all the four category of players i.e. Goal Keepers, Defenders, Midfielders and Forwards has no significant variance from each other whereas the Simple Visual Reaction Time(SVRT) of Goal Keepers was found significantly better than the players in other three positions.

When these results of this study were compared with some of the previous studies, it was found that research on the same age group of players (18-21 yrs) of various games yielded similar values of reaction times and that of football players was found significant. Not much research was done on playing positions of the players whereas in general a lot of research has been done on players which prove that the reaction time differs and varies from player to player and position to position.

As a conclusion it was found that Simple Visual Reaction Time (SVRT) of Goal Keepers was found significantly better than the players in other three positions and auditory reaction times had no significant difference.

V. Recommendations:

- i) It is recommended that similar work can be carried out on positional play in other team games too.
- ii) Improvement of reaction times of players as per their field positions may yield better results in the team performance.

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