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Dr Mahesh Kumar
Associate Professor C.R.M. Jat College, Hisar, Haryana, India

Correspondence
Dr Mahesh kumar
Associate Professor C.R.M. Jat College, Hisar, Haryana, India

Comparison of anticipation time of judokas, Wrestlers and Boxers

Dr Mahesh Kumar

Abstract
Objective of the study was to see if there is any significant difference exists between the judokas, wrestlers and boxers on anticipation time by comparing their anticipation time performances. To test the hypothesis that the three groups have non-significant differences on anticipation time variables namely number of early and late responses and also average time deviation from early and late responses, 96 male only sportspersons having mean age 22.49 ± 2.37 were being randomly tested who had at least participated at state level in their respective sport. Each sports person was given three trials of 20 responses and the average value of all the three trials was recorded on Basin anticipation timer (B.A.T.) machine. One way MANOVA using SPSS 23 statistical package was applied to get and analyze the results. There was a statistically non-significant difference in 4 anticipation time variables based on the sport which they practice, F (8, 180) = .651, $p > .05$; Wilk's Λ = 0.945, partial $\eta 2$ = .028. The null hypothesis that there would be no significant difference between the three groups was therefore accepted and alternate hypothesis was rejected.

Keywords: Anticipation time, Judokas, wrestlers, boxers, one way MANOVA

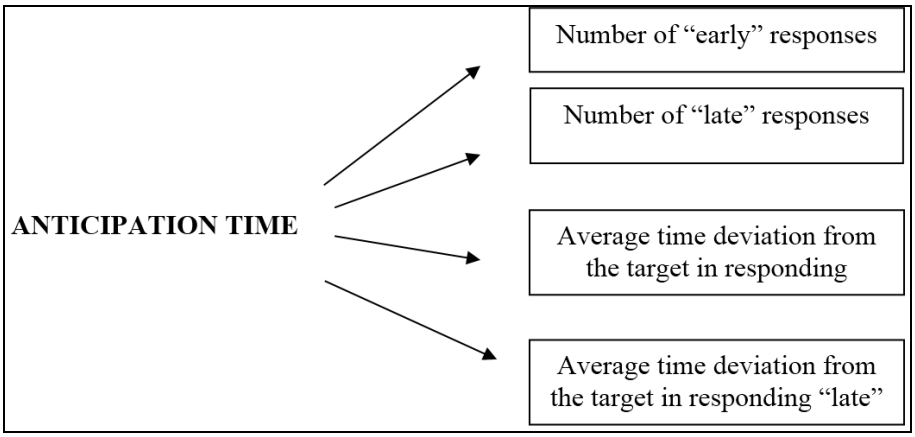
1. Introduction
We often see the skilled players perform a movement gracefully whereas the novice seem to be struggling for movement spending more than required energy for a particular movement pattern. We often see the researchers doing biomechanical and psychological studies to analyze the movements in elite sports for gaining that cutting edge in sports involving ball and other equipments where so called "timing" plays an important role.
The distinction between experts and their less-skilled counterparts has been a point of discussion in the sports perception literature since last many years and the vast majority of this research has revealed experts to be superior at anticipating the outcome of opponents' actions (e.g., Abernethy & Zawi, 2007) [1]. The ability to anticipate or "predict" an upcoming attack in combat sport like wrestling, Judo or the direction of a penalty kick in football or in tennis prior to definitive ball flight information becoming available (i.e., before ball-foot or ball-racket contact) would enable the players with crucial time to prepare for both anticipating and reacting effectively.
With that extra time available due to successful anticipation is not only psychologically advantageous, but may also be essential in circumstances where response time becomes too important with each bout or set making the player too tired to merely rely upon only strength and skills with increase pressure to give in the best. In boxing for example a few milliseconds are available to judge the speed and direction of the punch, move and get in the right position for the block and/or return, again prepare for and execute the next offensive movement needed for the desired offensive. Given the same level of fitness, body mass index, talent and skill training for two players, it is the ability to accurately anticipate opponents' intentions during the early stages of preparation that may make a distinction between winning and losing.
The expert sports performers as compared to their lesser-skilled counterparts are both not only more accurate but also they are faster at anticipating the course of opponents' actions to utilize the information for successful sports performance even during fatigue and pressure conditions. This ability to anticipate well has been found to be largely due to the pick up or extraction of relevant advance cues that are contained within opponents' kinematic movements. The fact that the anticipation ability and level of performance correlation being significantly positively

correlated therefore anticipation is a major pre-requisite skill required for better and improved sports performance. In the recent times the coaches, particularly those coaching elite sportspersons, focus on developing the perceptual skill of their players in addition to their specific fitness and related components simulating those patterns of movements that requires higher level of scrutiny and training.

2. Methodology

Sample: 96 male sports persons from 3 different groups/ combat sports namely: Wrestling (N=32), Judo (N=32) and Boxing (N=32) who had minimum state level participation in the age group of 18 to 28 years were randomly selected.

Tools: *Basin Anticipation timer* - The Basin timer is a ten-foot long row of lights that is controlled by a variable speed potentiometer. In the experiment, the sequence of lights traveled down the track at a rate of three miles per hour. The subject was instructed to anticipate the arrival of the light at the end of the track and press the button to stop the light the moment it reaches the last L.E.D. which was aligned with the end of the track to record his or her time. There is a digital display meter, which shows the subjects response in seconds/milliseconds. The panel on the machine has controls for setting warning signal time, runway speed, the start switch, the reset switch & the push button as an option, attached to the machine.



Anticipation Time measurement- The subject sat 2-3 feet away from the target lamp. The distance from the target lamp was kept constant. Subjects had to press the stylus button for their push button response as soon as the light traveling on the rectangular metal pipe reaches the last light emitting diode (L.E.D.).

The runway speed was set to 3 mph.

- Select the warning light fore period at 3 seconds.
- Press RESET to prepare for a new trial.
- Press START to initiate a trial. After the fore period warning interval passes, the light sequence was traveling down the runway.

Each phase of trial was indicated by the special indicator lamps i.e. WARNING, RUN, FINISH, RESPONSE, special lamps, EARLY & LATE, indicated the direction of the subject's error. The tester resets the apparatus after each response. The digital L.E.D. timer indicates the early or late response duration with seconds/millisecond accuracy. Each sports person was given three trials of 20 responses and the average value of all the three trials was recorded.

3. Results and discussion

Table-1 shows descriptive statistics of mean and standard deviation of Judoka's (7.00 ± 4.43), wrestlers (8.13 ± 3.75) and Boxers (7.56 ± 4.71) on number of early responses. Judoka's were found to have committed lesser early response errors as compared to the other two with wrestlers committing highest that indicates over arousal amongst the wrestlers comparatively. Figure-1 shows graphical representation of the same.

Mean and standard deviation of Judoka's (7.59 ± 4.09), wrestlers (7.50 ± 4.33) and Boxers (8.47 ± 3.96) on number of "LATE" responses. Here again the Boxers committed higher "Late" errors in comparison to other two groups which shows that the boxers were under aroused comparatively. Figure-1 shows graphical representation of the same.

Mean and standard deviation of Judoka's (.056 ± .019), wrestlers (.056 ± .019) and Boxers (.052 ± .017) on total average time deviation for "early" response. The Boxers showed lesser deviation (from 0.00, the ideal response) in comparison to other two groups which is an indicator of boxers having performed better in comparison to other two groups. Figure-2 shows graphical representation of the same.

Mean and standard deviation of Judoka's (.059 ± .016), wrestlers (.059 ± .017) and Boxers (.060 ± .014) on total average time deviation for "LATE" response. The Judokas and wrestlers showed better mean values as compared to Boxers who showed higher deviation (from 0.00, the ideal response) in comparison to other two groups which is an indicator of Judokas and wrestlers having performed better in comparison to boxers. Figure-2 shows graphical representation of the same.

Table 1: Descriptive statistics showing mean and standard deviation of Judoka's, wrestlers and Boxers on 4 dependant variables.

Descriptive Statistics				
Group		**Mean**	**Std. Deviation**	**N**
Number of early responses	Judoka	7.00	4.43	32
	wrestler	8.13	3.75	32
	Boxer	7.56	4.71	32
Number of LATE responses	Judoka	7.59	4.09	32
	wrestler	7.50	4.33	32
	Boxer	8.47	3.96	32
Total average time deviation for "early" response	Judoka	0.056	0.019	32
	wrestler	0.056	0.019	32
	Boxer	0.052	0.017	32
Total average time deviation for "LATE" response	Judoka	0.059	0.016	32
	wrestler	0.059	0.017	32
	Boxer	0.060	0.014	32

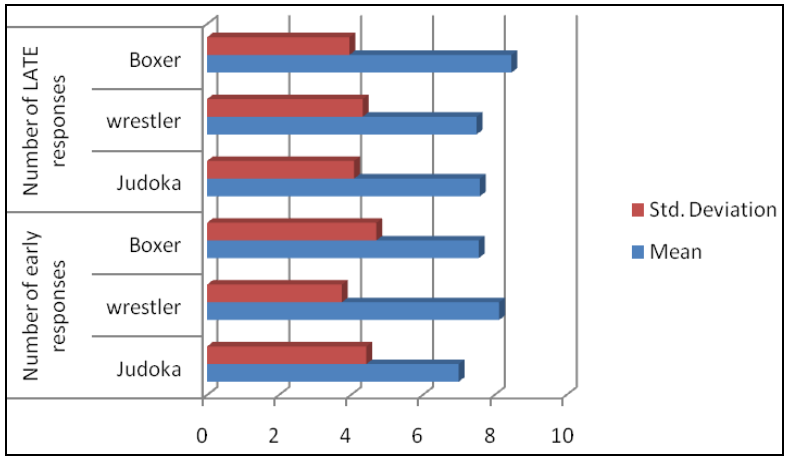


Fig 1: Bar chart showing mean and standard deviation of Judoka's, wrestlers and Boxers on number of early and late responses.

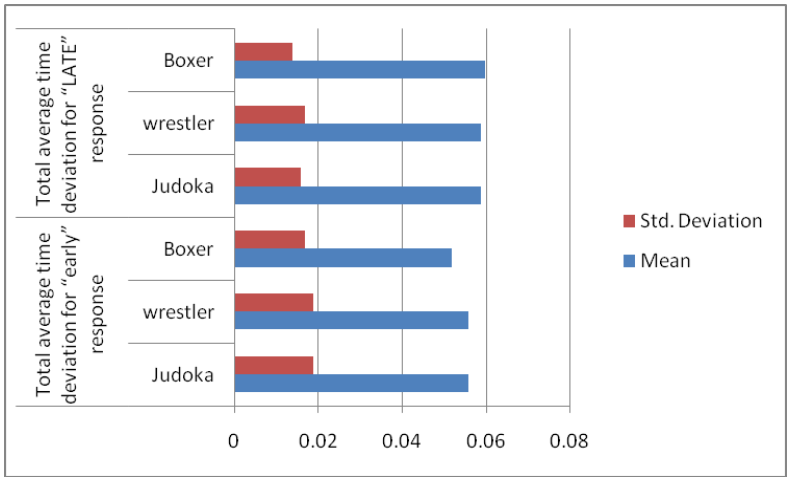


Fig 2: Bar chart showing mean and standard deviation of Judoka's, wrestlers and Boxers on total average time deviation from early and late responses.

Prior to conducting the MANOVA, a series of Pearson correlations were performed between all of the dependent variables in order to test the MANOVA assumption that the dependent variables would be correlated with each other in the moderate range. As can be seen in Table 2, a meaningful pattern of correlations was observed amongst most of the dependent variables, suggesting the appropriateness of a MANOVA.

As shown in Table-2, a Pearson product-moment correlation coefficient was computed to assess the relationship between the 4 variables. There was a significant negative correlation between Number of early responses and total average time deviation for LATE responses (r = -.211, n =96, p = .039). There was a significant negative correlation between Number of late responses and total average time deviation for early responses (r = -.216, n =96, p = .034) and there was a highly significant negative correlation between Number of late responses and total average time deviation for LATE responses (r = -.300, n =96, p = .003). There was a highly significant positive correlation between Total average time deviation for early responses and Total average time deviation for early responses (r = .687, n =96, p = .000)

Table 2: Pearson Correlation between all 4 dependent variables

Correlations					
		Number of early responses	**Number of LATE responses**	**Total average time deviation for early responses**	**Total average time deviation for LATE responses**
Number of early responses	Pearson Correlation	1	.138	-.059	-.211*
	Sig. (2-tailed)		.179	.566	.039
	N	96	96	96	96
Number of LATE responses	Pearson Correlation	.138	1	-.216*	-.300**
	Sig. (2-tailed)	.179		.034	.003
	N	96	96	96	96
Total average time deviation for early responses	Pearson Correlation	-.059	-.216*	1	.687**
	Sig. (2-tailed)	.566	.034		.000
	N	96	96	96	96
Total average time deviation for LATE responses	Pearson Correlation	-.211*	-.300**	.687**	1
	Sig. (2-tailed)	.039	.003	.000	
	N	96	96	96	96
*. Correlation is significant at the 0.05 level (2-tailed).					
**. Correlation is significant at the 0.01 level (2-tailed).					

The Box's M value of 22.379 as shown in table-3 was associated with a p value of .398, which was interpreted as non-significant (i.e., $p > .05$). Thus, the covariance matrices between the groups were assumed to be equal for the purposes of the MANOVA.

Table 3: Box's Test of Equality of Covariance Matrices[a]

Box's Test of Equality of Covariance Matrices[a]	
Box's M	22.379
F	1.049
df1	20
df2	31046.084
Sig.	.398
Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.	
a. Design: Intercept + group	

Table-4 shows a one-way MANOVA revealed a non-significant multivariate main effect for group, Wilks' $\lambda = .095$, F (8, 180) = .651, $p >$. 001, partial eta squared = .028. Power to detect the effect was .296. Thus null hypothesis is confirmed.

Table 4: One way multivariatess analysis of variance (MANOVA) showing Wilks' Lambda test for the three groups namely Judoka's, wrestlers and boxers

Multivariate Tests[a]								
Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Observed Power[d]
Intercept	Pillai's Trace	0.969	713.005[b]	4	90	0	0.969	1
	Wilks' Lambda	0.031	713.005[b]	4	90	0	0.969	1
	Hotelling's Trace	31.689	713.005[b]	4	90	0	0.969	1
	Roy's Largest Root	31.689	713.005[b]	4	90	0	0.969	1
group	Pillai's Trace	0.056	0.655	8	182	0.73	0.028	0.298
	Wilks' Lambda	0.945	.651[b]	8	180	0.734	0.028	0.296
	Hotelling's Trace	0.058	0.647	8	178	0.738	0.028	0.294
	Roy's Largest Root	0.045	1.028[c]	4	91	0.397	0.043	0.313
a. Design: Intercept + group								
b. Exact statistic								
c. The statistic is an upper bound on F that yields a lower bound on the significance level.								
d. Computed using alpha = .05								

Lidor R. *et al*. (1988) [3] compared the anticipation time, reaction time, and motor ability between skilled performers and novices for activities on team-handball Reaction time and movement time indicated high mean proficiency for the skilled participants in reaction time and all field-throwing tests compared with the novice participants.

Table-5 shows tests of between subjects effect that the type of sport being practiced has a statistically non-significant effect on all the four dependant variables. Number of early responses (F (2, 93) = .544; $p > .05$; partial $\eta^2 = .012$), Number of LATE responses (F (2, 93) = .536; $p > .05$; partial $\eta 2 = .011$), total average time deviation for early response (F(2, 93) = .454; $p > .05$; partial $\eta 2 = .010$), total average time deviation for LATE response (F(2, 93) = .050; $p > .05$; partial $\eta 2 = .001$).

Table 5: Tests of between subjects effect on dependant variables.

Tests of Between-Subjects Effects								
Source	**Dependent variable**	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**	**Partial Eta Squared**	**Observed Power[e]**
Corrected Model	Number of early responses	20.250[a]	2	10.125	.544	.582	.012	.137
	Number of LATE responses	18.271[b]	2	9.135	.536	.587	.011	.136
	Total average time deviation for early response	.000[c]	2	.000	.454	.637	.010	.122
	Total average time deviation for LATE response	2.408E-5[d]	2	1.204E-05	.050	.952	.001	.057
Intercept	Number of early responses	5490.375	1	5490.375	294.913	.000	.760	1.000
	Number of LATE responses	5922.042	1	5922.042	347.764	.000	.789	1.000
	Total average time deviation for early response	.289	1	.289	836.048	.000	.900	1.000
	Total average time deviation for LATE response	.341	1	.341	1408.534	.000	.938	1.000
Group	Number of early responses	20.250	2	10.125	.544	.582	.012	.137
	Number of LATE responses	18.271	2	9.135	.536	.587	.011	.136
	Total average time deviation for early response	.000	2	.000	.454	.637	.010	.122
	Total average time deviation for LATE response	2.408E-05	2	1.204E-05	.050	.952	.001	.057
Error	Number of early responses	1731.375	93	18.617				
	Number of LATE responses	1583.688	93	17.029				
	Total average time deviation for early response	.032	93	.000				
	Total average time deviation for LATE response	.023	93	.000				
Total	Number of early responses	7242.000	96					

	Number of LATE responses	7524.000	96					
	Total average time deviation for early response	.321	96					
	Total average time deviation for LATE response	.364	96					
Corrected Total	Number of early responses	1751.625	95					
	Number of LATE responses	1601.958	95					
	Total average time deviation for early response	.032	95					
	Total average time deviation for LATE response	.023	95					
a. R Squared = .012 (Adjusted R Squared = -.010)								
b. R Squared = .011 (Adjusted R Squared = -.010)								
c. R Squared = .010 (Adjusted R Squared = -.012)								
d. R Squared = .001 (Adjusted R Squared = -.020)								
e. Computed using alpha = .05								

Hua Jin *et al*. (2011) [2] in their event related study entitled "Event-related potential effects of superior action anticipation in professional badminton players" compared brain responses from professional badminton players and non-player controls when they watched video clips of badminton games and predicted a ball's landing position. The results identify clear neural responses that differentiate between different levels of action anticipation associated with sports expertise which was not similar to our study though but this study was found reasonable as compared to other studies not worth mentioning due to dearth of studies on comparison of wrestlers, Judoka's and boxers of India.

In the present study, the partial eta squared (an estimate of the amount of the "effect size" attributable to between-group differences (differences in levels of the IV). Table-4 shows weak effect size (much less than 1). Further the power to detect the effect as shown in the last column of table-3 of observed power heading is close to 0, hence very less.

References

1. Abernethy, Zawi. Pickup of essential kinematics underpins expert perception of movement patterns. J Mot Behav. 2007; 39 (5):353-67
2. Hua Jin *et al*. Event-related potential effects of superior action anticipation in professional badminton players. Neuroscience Letters, Elsevier Ireland Ltd. 2011.
3. Lidor R, Argov E, Daniel S. An exploratory study of perceptual-motor abilities of women: novice and skilled players of team handball. Europe PMC plus. 1998, 86(1):279-288.