Chapter Four - Results and Discussion

INTRODUCTION

Results and discussions are presented in this chapter. Results and discussions of each experiment is presented one after the other from Experiment 1 to Experiment 7. Results and discussion of each experiment begins with introduction of relevance of experiment, sequence of analysis done, hypotheses and objectives related to the experiment. This is followed by results and discussion. Finally there is a conclusion at the end of each experiment in the context of hypotheses and objectives of the experiment.

After completion of all seven experiment, there follows general discussion which focuses on overall integration of all findings and their relevance for EPIC - SRD model in particular and PRP procedures in general.

In all 21 subjects participated in the experiments, of which one dropped out in the 5th experiment because of ill-health and social commitment. All subjects spent about 4 hours for five days to complete all experiments. In all experiments subjects were given practice trials untill they felt well familiarized with the procedure. In final analysis of data, responses of practice trials, and wrong responses were deleted. Besides, all outlier cases were also deleted. Outliers were decided on the basis of standard deviation. All responses $\pm$ 3 standard deviation, after deletion of practice trials and error responses, were removed as deleted. In some experiments blank screens were alternated as catch trials. These blank screen stimuli were also marked as deleted. Only first 50 responses from Experiment 2 were considered for data analysis in order to equate number of responses with Experiment 3 and Experiment 4. Table 8 presents summary statistics of overall responses, deleted responses and included responses in data analysis. It also reports total number of keypresses that subjects made in order to complete each experiment.

In Experiment 2, 3 and 4 firstly data was analysed to understand influence of independent factors, namely Hand, Finger, and Individual differences as well as their interaction effects. This was achieved by Univariate Analysis of Variance. No post-hoc tests were done. This is because, Hand and Finger varies on two levels only. Whereas individual differences will yield about 420 different combination of means and the pile of such data is irrelevant for the present purpose of research. In univariate analysis stimulus could not be included as an independent variable because hand and finger data codes overlaps with stimulus codes. So only descriptive statistics could be generated for stimulus variable.

Univariate analysis is followed by descriptive statistics of mean, standard deviation (SD) and Coefficient of Variation (V) for overall, hands, fingers, stimulus and individual subjects. Purpose of descriptive statistics is to highlight variation in mean response time as function of different independent factors. SD has been reported to understand differences in dispersion for different independent factors. Coefficient of Variation (V) is treated here as a ratio of SD to the mean. Typically in most of the empirical reaction time studies Coefficient of Variation has been found to be 0.2. Finally, frequency distribution of reaction time is presented for overall, hands, fingers and subjects. This distribution gives idea about the general trend of actual responses numerically and graphically for different independent factors.

Table 8 shows overall number of responses, deleted responses, included respoonses and keypress obtained from all subjects experimentwise

Experiment		Overall	Deleted	included	Keypress
Expt 1	Stimulus Identification	23880	4105	19775	23880
Expt 2	Repetitive Response	9240	5114	4126	9240
Expt 3	Single Keypress	6987	3912	3075	13974
	Double Keypress	6576	2599	3977	13152
Expt 4	Serial	8854	1191	7663	8854
	Reverse	4747	1757	2990	9494
	Alternate	4743	1152	3591	9486
Expt 5	Dual Task	31313	1413	29900	62626
	Tripple Task	62832	3553	59279	125664
Expt 6	Matched Figure Test	1360	160	1200	1360
Expt 7	Embeded Figure Test	1440	164	1276	1440
	Total	161972	25120	136852	279170

Experiment 1

Stimulus Identification

This experiment was done to understand variation in stimulus identification as a function of display time. Obviously, stimulus identification is considered the first of three components (viz. stimulus identification, response selection and movement production) of reaction time process. No scores have been collected in this experiment. Subject responses have been evaluated in terms of correct or incorrect identification of stimuli at different time interaval.

Firstly, cross-tabulation is presented stimuliwise and responsewise along with frequency and percentage of responses. This is followed by percentage data of correct identification for stimuli, responses, display time, and subjects. These data revealed variations in correct stimulus identification as a result of several factors and their combinations.

Perecentage analysis is followed by contingency chi-square analysis of correct stimulus identification for each stimulus and for each display time interval.

This experiment is related to hypothesis 5 "There will be no significant difference in stimulus identification time for all the four stimuli". The objecitve 10 "To understand the trial-to-trial variations in individual performance under different experimental conditions in context of theoretical formulation of EPIC based SRD model of PRP procedures" is related to this experiment.

Table 9 shows cross-tabluation of stimulus and participant keypress along with their frequency and percentage.

			Answer Choice					Total
			Blank	D	F	4	5	
STIMULUS	Blank	Count	4257	226	88	92	220	4883
		%	87.2%	4.6%	1 8%	1.9%	4.5%	100.0%
	D	Count	238	4173	111	72	234	4828
		%	4.9%	86.4%	2.3%	1.5%	4.8%	100.0%
	F	Count	292	376	3737	66	180	4651
		%	6.3%	8.1%	80.3%	1.4%	3.9%	100.0%
	4	Count	286	369	111	3626	390	4782
		%	6.0%	7 7%	2.3%	75.8%	8.2%	100.0%
	5	Count	276	323	83	72	3982	4736
		%	5.8%	6.8%	1.8%	1.5%	84.1%	100.0%
Total		Count	5349	5467	4130	3928	5006	23880
		%	22.4%	22.9%	17.3%	16.4%	21.0%	100.0%

Table 9 shows count and percentage of answer choice indicated by the subject in response to given stimulus. Blank screen was the most correctly identified stimulus, followed by D, 5, F and 4 respectively.

Blank screen was confused maximally with D. D was maximally confused with Blank screen. F was maximally confused with D. 4 was maximally confused with 5. 5 was maximally confused with D.

Chart 1 and Chart 2 shows graphical representation of the above data.

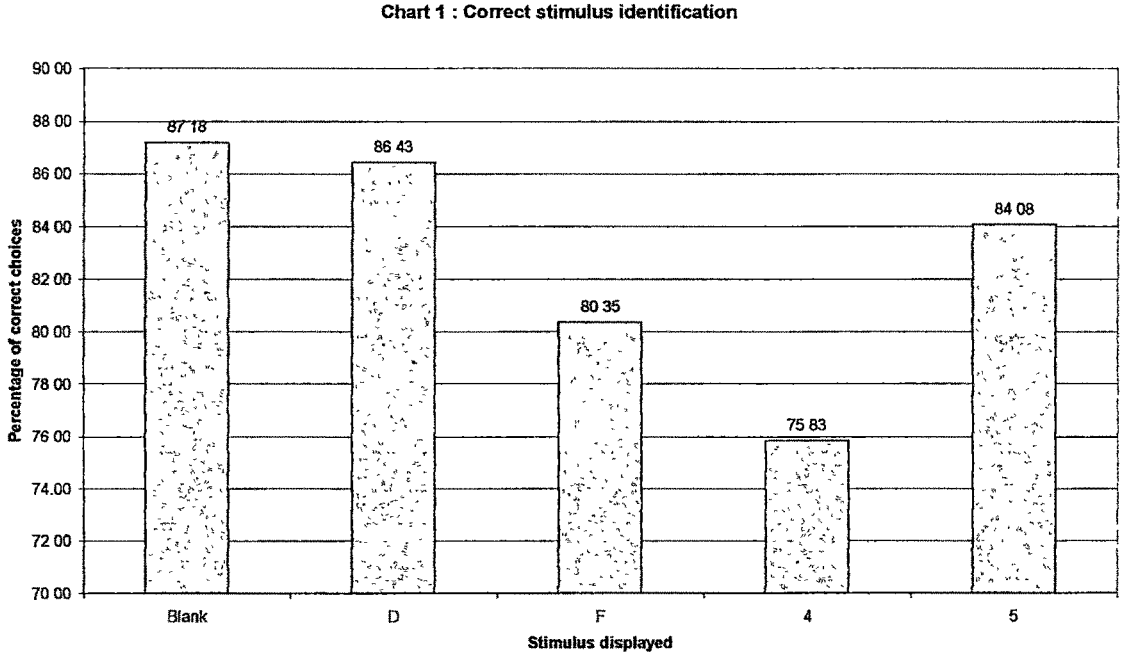


Chart 2 : Percentage of error in answer choice and Stimulus

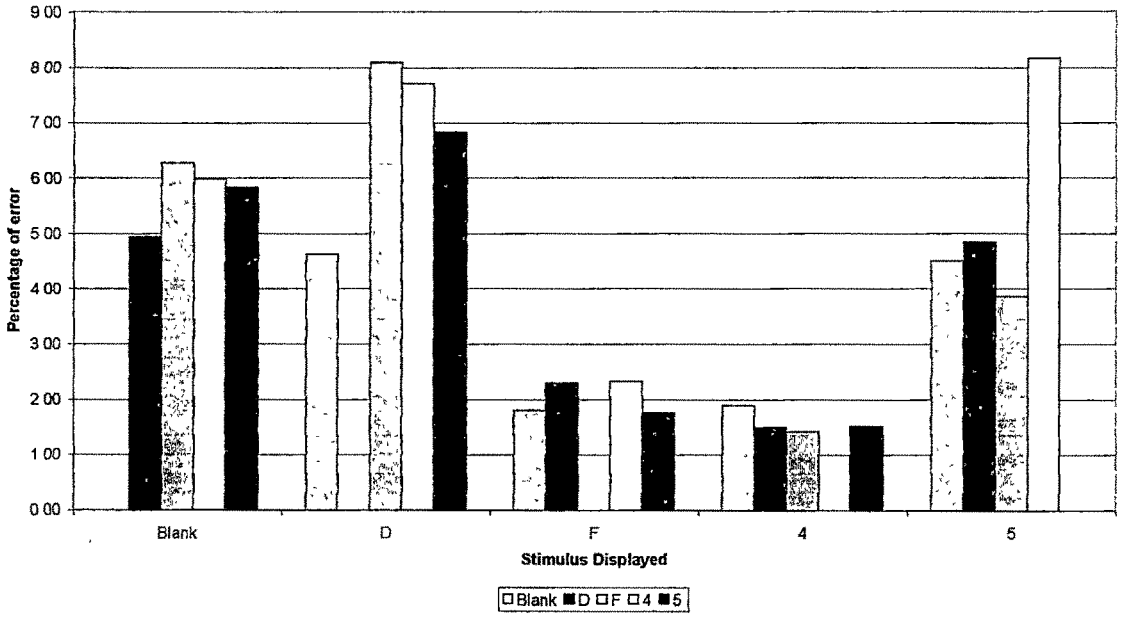


Table 10
Percentage of correct answer choices for each stimulus and display time

Time	Blank	D	F	4	5
10	71.51	56.64	44.70	42.24	56.12
20	79.82	71.00	64.36	55.68	70.75
30	76.11	75.49	59.22	48.63	68.27
40	87.29	87.94	81.13	71.94	84.52
50	93.45	96.63	91.81	89.76	92.24
60	93.47	94.32	91.30	86.33	94.16
70	96.03	96.63	95.62	93.33	96.30
80	97.53	99.08	97.93	97.39	98.48
90	88.10	98.62	96.57	95.95	97.35
Total	87.11	86.29	80.24	75.68	84.15

Table 10 shows percentage of correct answer choices for each stimulus and each display time. For all stimuli highest detection rate has been at 80 ms and it gradually declines as display time reduces.

Above data has been shown graphically in the Chart 3 below.

Chart 3 : Display time and Stimulus identification percentage

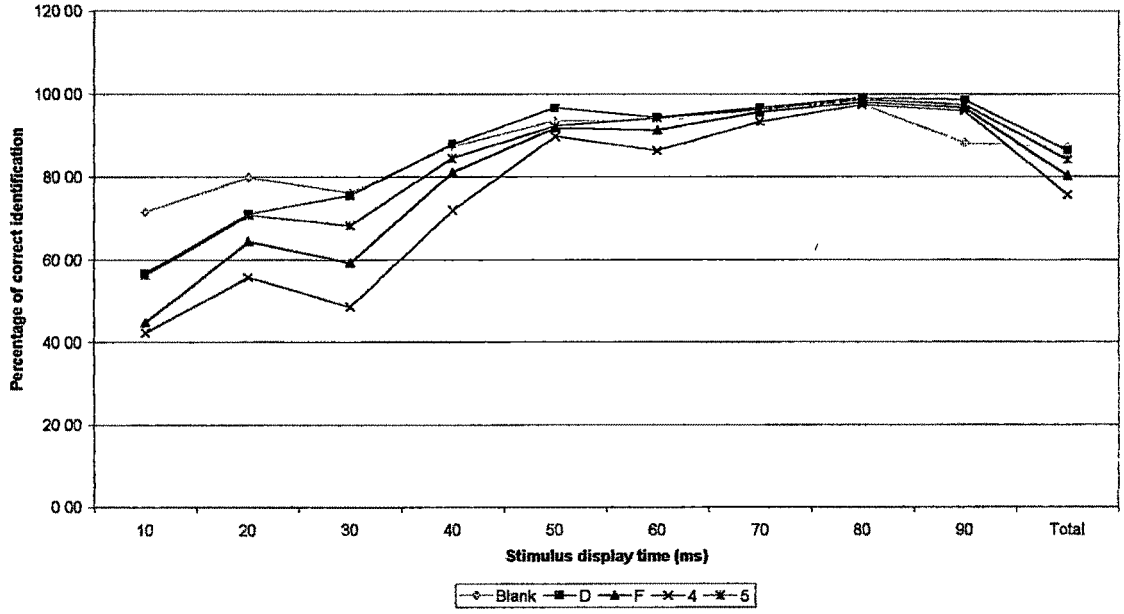


Table11

Percentage of errors in stimulus identification for each stimulus and display time

Blank Screen				
Time	D	F	4	5
10	8.72	5.04	4.84	9.88
20	5.59	4.32	3.60	6.67
30	7.90	2.89	4.43	8.67
40	4.81	1.37	1.03	5.50
50	3.97	0.20	0.99	1.39
60	3.17	1.06	0.53	1.76
70	1.39	0.20	0.79	1.59
80	0.88	0.35	0.18	1.06
90	6.15	0.99	0.99	3.77
Total	4.69	1.83	1.91	4.46
D				
Time	Blank	F	4	5
10	16.02	6.05	5.08	16.21
20	9.29	6.32	3.72	9.67
30	8.17	4.28	2.14	9.92
40	3.90	1.95	1.77	4.43
50	1.59	0.20	0.20	1.39
60	2.93	1.47	0.37	0.92
70	1.59	0.79	0.20	0.79
80	0.37	0.00	0.00	0.55
90	0.79	0.00	0.20	0.40
Total	4.94	2.34	1.52	4.90
F				
Time	Blank	D	4	5
10	19.65	17.73	5.39	12.52
20	7.74	15.68	4.28	7.94
30	12.04	19.42	1.94	7.38
40	5.84	9.73	0.58	2.72
50	4.19	2.86	0.00	1.14
60	2.28	4.76	0.21	1.45
70	2.48	1.33	0.38	0.19
80	0.62	0.41	0.21	0.83
90	1.33	1.71	0.00	0.38
Total	6.29	8.19	1.44	3.84
4				
Time	Blank	D	F	5
10	15.09	17.46	7.76	17.46
20	12.19	13.84	4.61	13.67
30	11.37	18.32	5.26	16.42
40	6.43	9.87	1.41	10.34
50	1.90	3.33	0.95	4.05
60	3.07	4.15	0.92	5.53
70	1.43	0.95	0.71	3.57
80	1.23	0.46	0.00	0.92
90	0.95	1.19	0.00	1.90
Total	6.01	7.75	2.34	8.22
5				
Time	Blank	D	F	4
10	17.18	16.64	5.67	4.39
20	8.30	14.11	3.32	3.53
30	8.67	17.16	3.69	2.21
40	5.95	5.56	1 59	2.38
50	3.88	3.17	0.35	0.35
60	2.38	1.95	0.65	0.87
70	1.94	1.41	0.18	0.18
80	0.65	0.87	0.00	0.00
90	1.76	0.53	0.35	0.00
Total	5.70	6.85	1.77	1.53

Table 4 shows percentage of error in answer choices for each stimulus and each display time. In all stimuli pattern of error percentage upto 50 ms is variable but in general beyond 50 ms there is continuous increase in percentage of errors in stimulus identification. The pattern of percentage increase beyond 50 ms is again varies for each stimulus and display time.

Above data has been shown graphically in the Chart 4, Chart 5, Chart 6, Chart 7 and Chart 8 below.

Chart 4 : Stimulus display timewise Blank screen identification errors

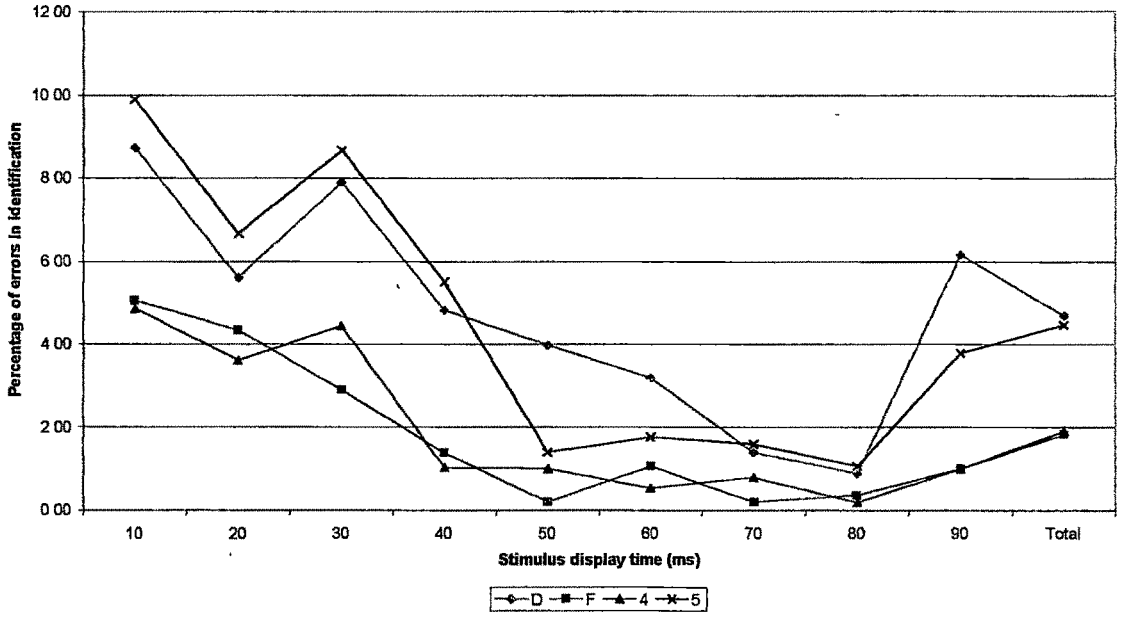


Chart 5 : Stimulus display timewise stimulus 'D' identification errors

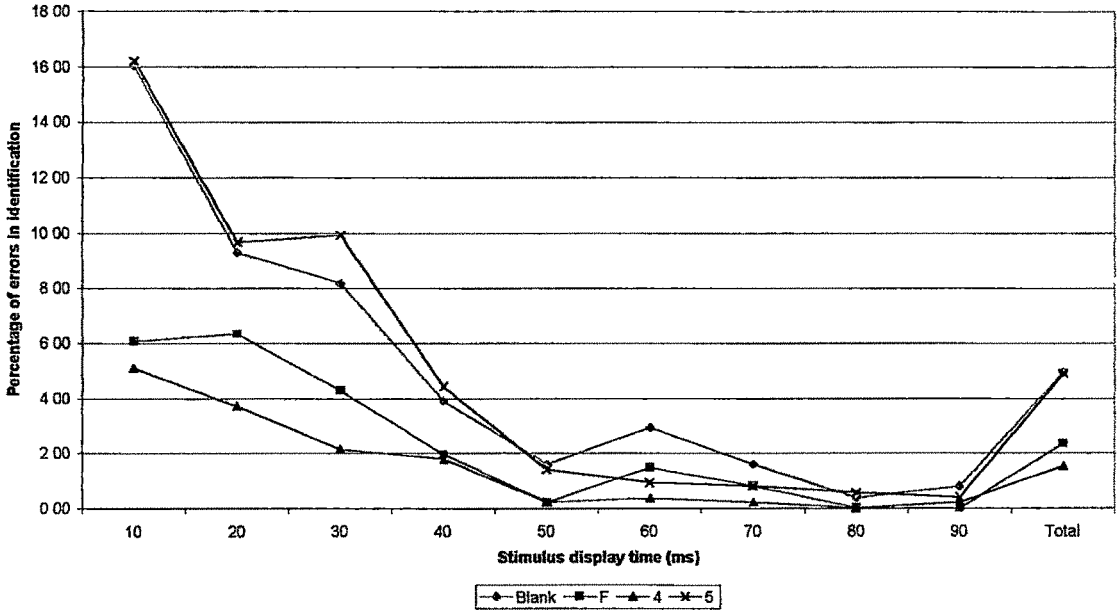


Chart 6 : Stimulus display timewise stimulus 'F' identification errors

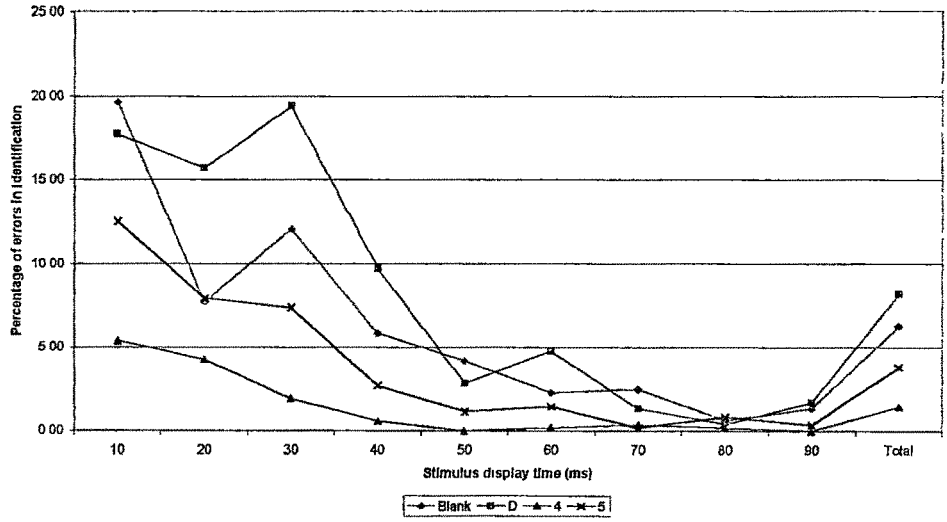


Chart 7 : Stimulus display timewise stimulus '4' identification errors

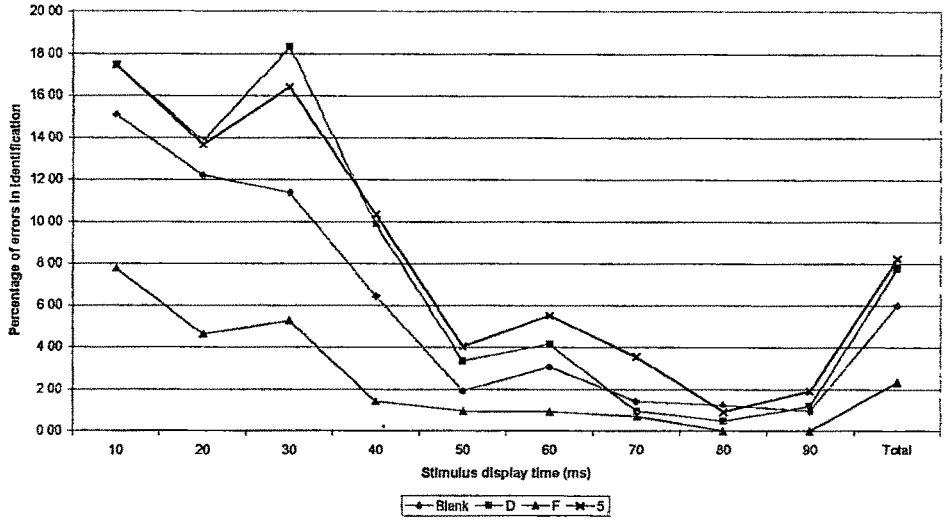


Chart 8 : Stimulus display timewise stimulus '5' identification errors

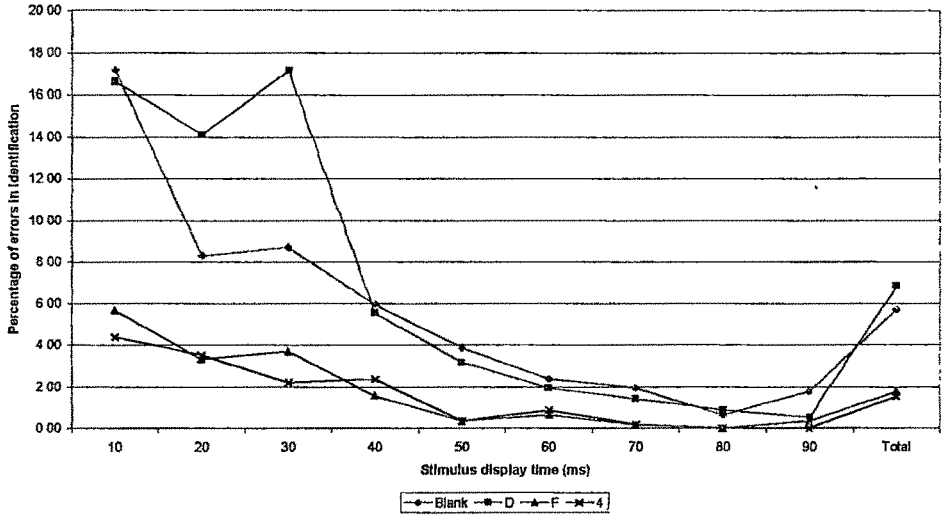


Table 12
Percentage of correct stimulus identification for all stimuli subjectwise

Name	Blank	D	F	4	5
Apurva	62.30	48.54	86.47	89.22	63.13
Yogesh	65.54	54.05	84.18	96.25	80.19
Shruti M.	66.06	62.45	75.57	74.32	70.79
Nidhi	68.95	59.04	84.08	81.38	76.80
Shruti S.	74.00	78.26	75.51	73.08	61.57
Sumit	74.06	70.11	85.03	91.94	77.67
Shweta	74.80	86.38	95.12	89.39	69.42
Darshini	75.19	64.44	92.95	95.12	75.70
Ragam	75.37	76.61	85.79	92.45	84.62
Sameena	75.64	63.74	90.96	90.68	59.46
Ruta	78.44	69.41	72.36	73.33	64.77
Hamza Ali	79.77	92.45	97.70	97.47	84.19
Soham	84.92	89.04	97.71	98.57	90.18
Minal	87.55	79.75	96.11	97.60	90.65
Sangeeta	89.18	95.85	98.83	100.00	82.79
Aditi	90.35	90.32	97.27	98.57	83.47
Veena	90.68	91.32	91.96	97.96	88.26
Kiran	91.30	91.48	96.04	99.04	93.98
Digvijay Singh	92.70	94.64	97.01	99.51	96.31
Keyoor	93.42	92.00	97.40	99.50	90.17
Rohit	95.61	97.73	96.23	100.00	100.00

Table 5 shows percentage of correct stimulus identification stimuluswise and subjectwise. Same data has been shown graphically overleaf in Chart 9. Stimulus Blank screen and D has been most correctly identified by Rohit (95.61% and 97.73%) whereas least by Apurva (62.30% and 48.54%). Stimulus F has been most correctly identified by Soham (97.71%) and least correctly by Ruta (72.36%). Stimulus 4 has been most correctly identified by Rohit and Sangeeta (100%) and least correctly by Ruta (73.33%). Stimulus 5 has been most correctly identified by Rohit (100%) and least correctly by Shruti S. (61.57%). As can be seen there is very high degree of variation in correct identification from subject to subject. The most correct identification is almost about 95+ percent whereas poor identification is about 50+ percent. Thus, the differences are in the range of about 40 to 50 percent.

Chart 9 : Subjectwise percentage of correct stimulus identification

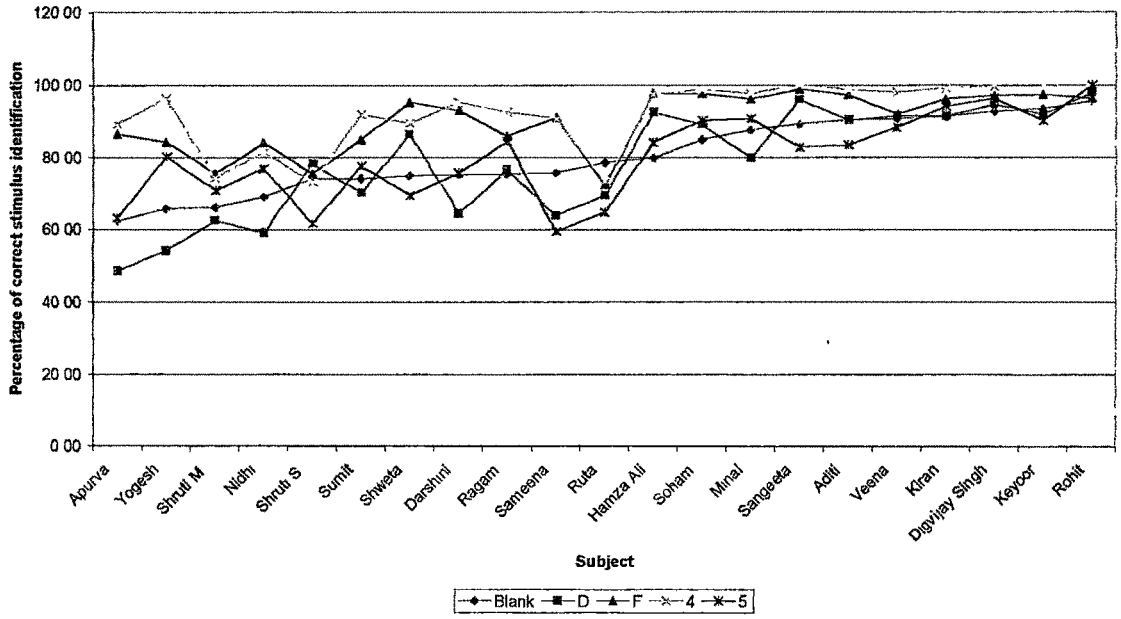


Table 13

Percentage of errors in stimulus identification for stimulus 4-5 subjectwise

4				
Name	**Blank**	**D**	**F**	**5**
Aditi	0.95	0.00	0.48	0.00
Apurva	3.92	2.94	2.94	0.98
Darshini	0.61	1.83	1.83	0.61
Digvijay Singh	0.49	0.00	0.00	0.00
Hamza Ali	0.51	0.51	1.52	0.00
Keyoor	0.00	0.50	0.00	0.00
Kiran	0.48	0.48	0.00	0.00
Minal	1.44	0.48	0.00	0.48
Nidhi	4.79	4.79	4.79	4.26
Ragam	1.26	1.26	1.89	3.14
Rohit	0.00	0.00	0.00	0.00
Ruta	10.56	7.22	6.11	2.78
Sameena	2.54	0.85	0.00	5.93
Sangeeta	0.00	0.00	0.00	0.00
Shruti M.	8.74	6.01	5.46	5.46
Shruti S.	3.37	6.25	4.33	12.98
Shweta	7.82	0.56	1.12	1.12
Soham	0.00	0.00	1.43	0.00
Sumit	2.42	4.03	0.81	0.81
Veena	0.51	0.51	0.51	0.51
Yogesh	1.88	1.25	0.00	0.63
5				
Name	**Blank**	**D**	**F**	**5**
Aditi	4.13	5.79	2.07	4.55
Apurva	6.06	6.57	3.03	21.21
Darshini	3.74	5.61	7.48	7.48
Digvijay Singh	1.84	0.46	0.46	0.92
Hamza Ali	4.27	2.99	5.13	3.42
Keyoor	1.71	2.56	1.28	4.27
Kiran	2.78	0.93	0.93	1.39
Minal	1.40	5.14	1.87	0.93
Nidhi	8.76	4.64	4.12	5.67
Ragam	3.37	2.88	0.48	8.65
Rohit	0.00	0.00	0.00	0.00
Ruta	4.17	10.23	4.92	15.91
Sameena	3.86	10.42	3.86	22.39
Sangeeta	10.23	1.86	2.79	2.33
Shruti M.	4.95	8.42	6.93	8.91
Shruti S.	5.79	9.50	8.26	14.88
Shweta	5.76	5.40	7.91	11.51
Soham	2.23	4.02	2.23	1.34
Sumit	0.93	2.79	3.26	15.35
Veena	1.74	2.61	2.61	4.78
Yogesh	12.26	0.00	2.83	4.72

Table 6 shows percentage of errors in answer choices for stimulus 4-5 for each subject. Above data has been shown graphically in the Chart 10, and Chart 11 overleaf.

Chart 10 : Subjectwise percentage of erros on stimulus 4

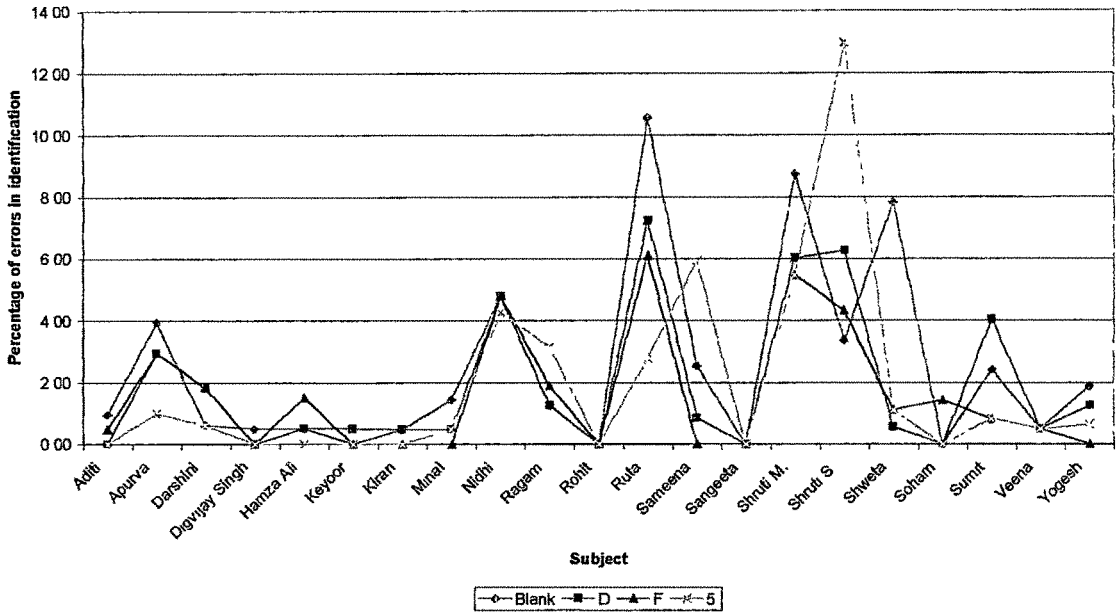


Chart 11 : Subjectwise percentage of erros on stimulus 5

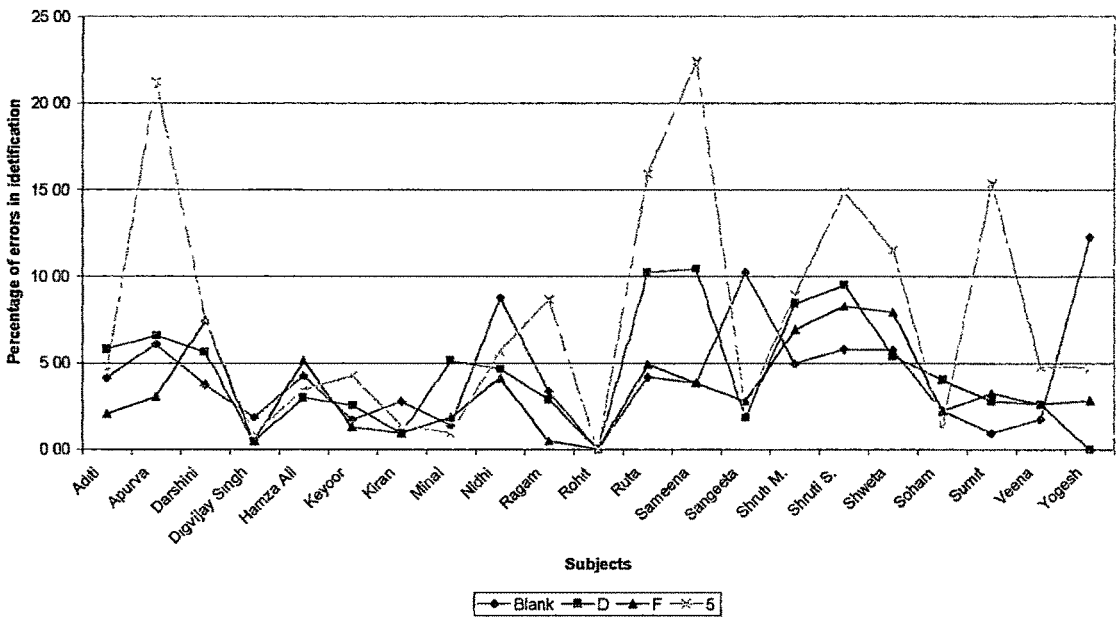


Table 14

Percentage of errors in stimulus identification for stimulus Blank-D subjectwise

Blank				
Name	Blank	D	F	5
Aditi	2.63	4.39	2.19	0.44
Apurva	8.20	8.52	9.18	11.80
Darshini	6.87	6.11	6.87	4.96
Digvijay Singh	0.43	3.00	1.72	2.15
Hamza Ali	4.58	5.73	5.34	4.58
Keyoor	0.88	2.63	2.19	0.88
Kiran	2.61	1.74	1.74	2.61
Minal	5.81	2.49	1.24	2.90
Nidhi	7.26	8.87	8.06	6.85
Ragam	3.36	7.84	7.84	5.60
Rohit	0.00	0.00	2.63	1.75
Ruta	5.05	5.05	5.05	6.42
Sameena	5.09	6.18	5.82	7.27
Sangeeta	1.55	2.06	3.61	3.61
Shruti M.	8.76	10.22	6.57	8.39
Shruti S.	5.20	5.60	7.20	8.00
Shweta	5.69	5.28	8.13	6.10
Soham	3.57	6.35	3.17	1.98
Sumit	6.14	5.12	8.53	6.14
Veena	1.69	2.97	2.54	2.12
Yogesh	4.05	10.14	10.14	10.14
D				
Name	Blank	D	F	5
Aditi	2.30	2.76	3.23	1.38
Apurva	4.68	16.08	16.67	14.04
Darshini	4.23	8.80	9.15	13.38
Digvijay Singh	1.34	0.89	3.13	0.00
Hamza Ali	0.94	2.36	2.36	1.89
Keyoor	1.78	4.00	1.33	0.89
Kiran	1.79	2.24	1.79	2.69
Minal	1.27	9.28	4.64	5.06
Nidhi	7.51	11.60	9.56	12.29
Ragam	3.63	4.44	10.89	4.44
Rohit	1.36	0.00	0.45	0.45
Ruta	4.11	11.87	8.68	5.94
Sameena	1.15	10.31	12.21	12.60
Sangeeta	2.59	0.52	0.00	1.04
Shruti M.	5.31	8.16	14.69	9.39
Shruti S.	3.80	7.61	3.80	6.52
Shweta	3.29	5.63	2.82	1.88
Soham	2.28	4.57	0.91	3.20
Sumit	0.38	8.81	12.64	8.05
Veena	0.91	3.65	1.83	2.28
Yogesh	22.19	9.14	8.36	6.27

Table 7 shows percentage of errors in answer choices for stimulus Blank-D for each subject. Above data has been shown graphically in the Chart 12, and Chart 13 overleaf.

Chart 12 : Subjectwise percentage of erros on stimulus Blank

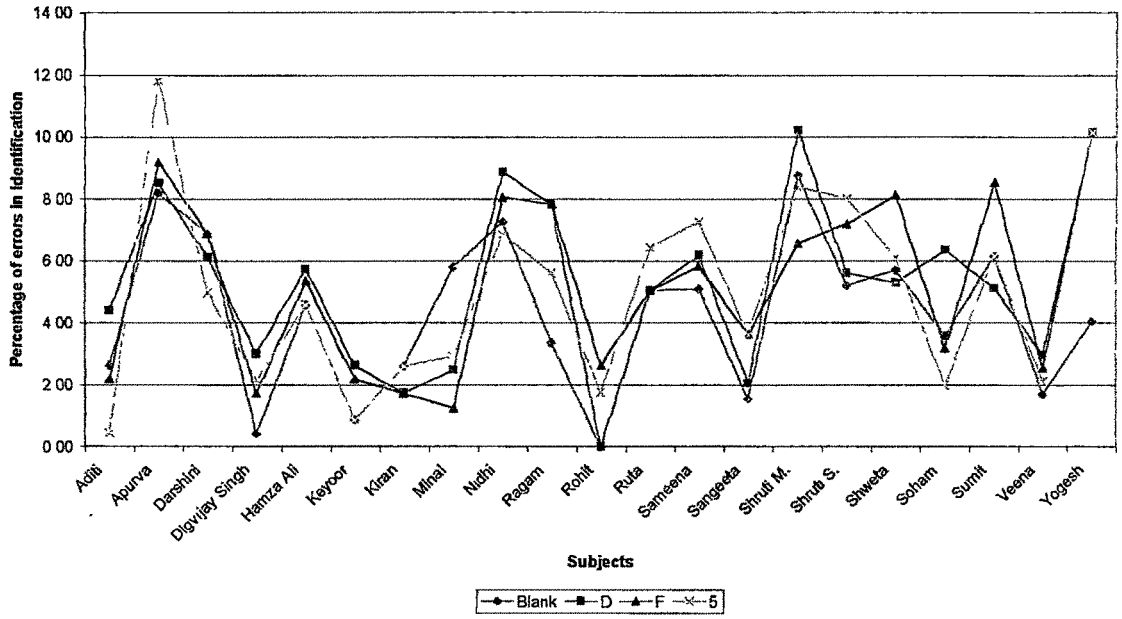


Chart 13 : Subjectwise percentage of erros on stimulus D

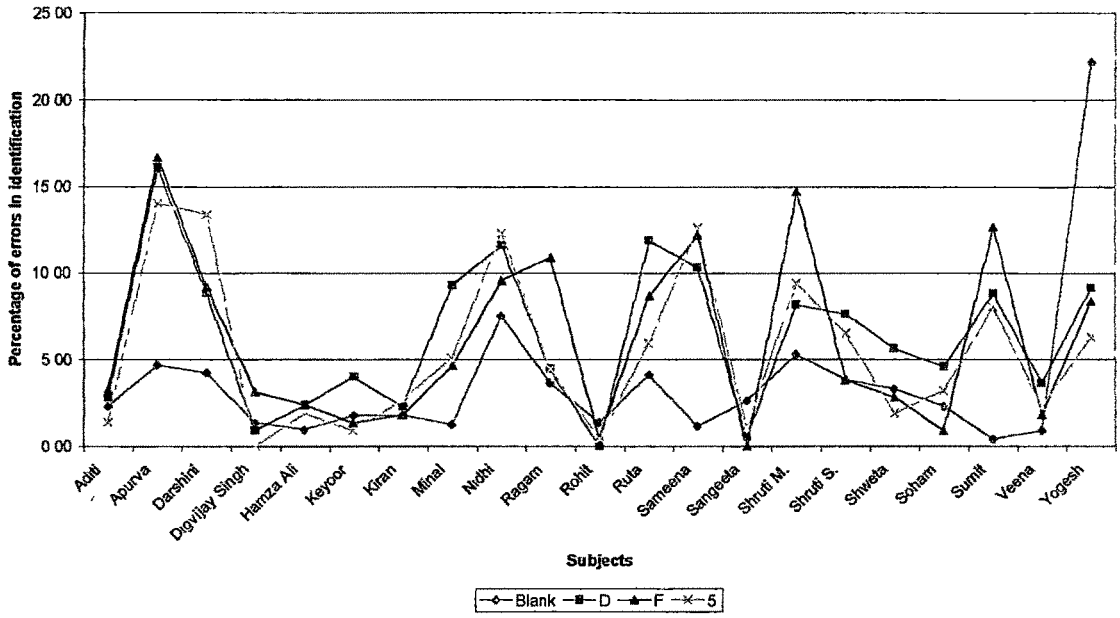


Table 15
Percentage of errors in stimulus identification for stimulus F subjectwise

F				
Name	**Blank**	**D**	**F**	**5**
Aditi	1.64	0.00	0.00	1.09
Apurva	1.50	6.77	1.50	3.76
Darshini	3.85	0.00	2.56	0.64
Digvijay Singh	0.00	1.00	1.49	0.50
Hamza Ali	1.15	0.00	0.00	1.15
Keyoor	1.56	0.00	1.04	0.00
Kiran	1 49	1.49	0.99	0.00
Minal	2.22	0.56	0.56	0.56
Nidhi	3.18	4.46	5.10	3.18
Ragam	2.03	4.57	3.55	4.06
Rohit	1.42	0.47	1.89	0.00
Ruta	7.04	6.53	8.04	6.03
Sameena	0.00	4.22	4.22	0.60
Sangeeta	0.00	0.00	0.58	0.58
Shruti M.	2.27	6.25	6.82	9 09
Shruti S.	5.61	11.73	3.57	3.57
Shweta	1.83	1.22	1.22	0.61
Soham	0.00	1.71	0.00	0.57
Sumit	0.53	2.14	8.02	4.28
Veena	1.51	2.51	3.52	0.50
Yogesh	7.34	0.56	5.08	2.82

Table 8 shows percentage of errors in answer choices for stimulus F for each subject. Above data has been shown graphically in the Chart 14 below.

Chart 14 : Subjectwise percentage of erros on stimulus F

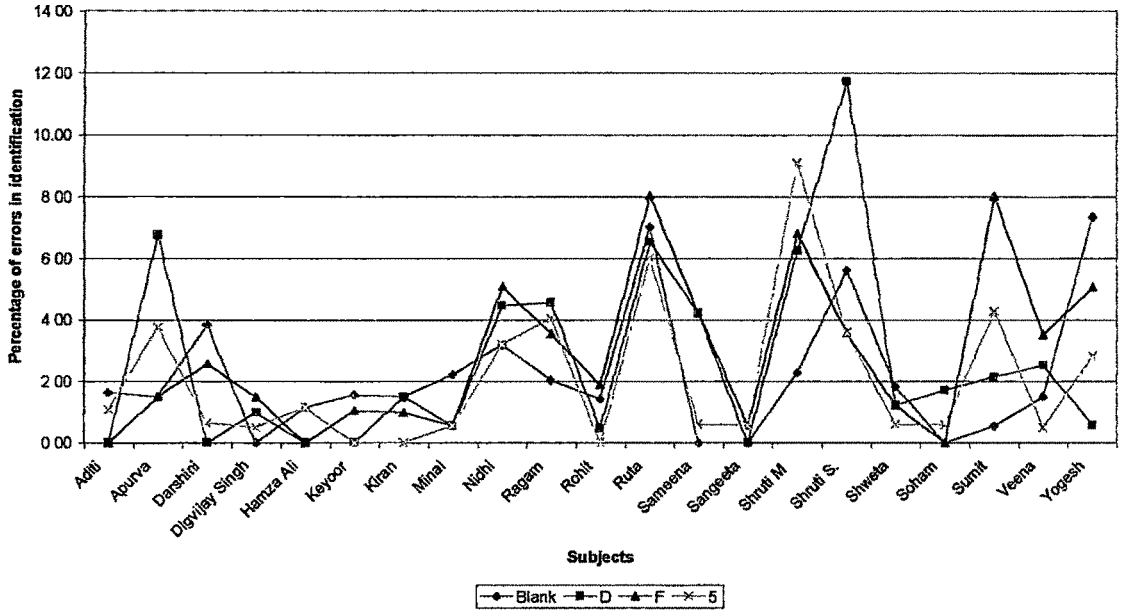


Table 16

Percentage of errors in stimulus identification for all stimulus subjectwise

	10	20	30	40	50	60	70	80	90
Rohit	5.04	2.50	1.67	0.00	0.00	1.67	0.83	0.83	6.67
Digvijay	13.33	1.67	15.00	1.67	0.83	0.00	2.50	0.00	1.67
Keyoor	13.33	11.67	10.00	9.17	1.67	1.67	2.50	0 83	0.83
Kiran	13.33	11.67	14.17	3.33	1.67	2.50	3.33	0.00	1.67
Sangeeta	15.83	9.17	0.00	9.17	5.00	6.67	2.50	1.67	6.67
Veena	20.00	19.17	17.50	5.83	2.50	1.67	1.67	4.17	0.83
Yogesh	30.83	32.50	38.33	43.33	25.00	38.33	18.33	7.50	18.33
Soham	34.17	14.17	11.67	4.17	2.50	5.00	2.50	0.00	1.67
Aditi	42.50	8.33	8.33	6.67	1.67	2 50	0.00	0.83	5.00
Minal	45.00	14.17	25.00	5.00	1.67	0.83	0.00	0.00	0.00
Hamza Ali	48.33	20.00	20.00	4.17	0.00	0.83	0.00	0.83	1.67
Sumit	55.83	44.17	42.50	30.00	8.33	11.67	3.33	2.50	1.67
Shweta	61.67	30.83	50.00	11.67	4.17	6.67	0.83	0.83	2.50
Ruta	64.17	60.83	58.33	32.50	12.50	14.17	6.67	1.67	7.50
Sameena	65.00	47.50	52.50	35.83	11.67	8.33	8.33	5.83	9.17
Apurva	65.83	63.33	55.83	45.00	29.17	24.17	20.00	5.83	18.33
Shruti M.	65.83	68.33	64.17	45.00	13.33	13.33	5.83	1.67	0.83
Ragam	67.50	40.00	33.33	16.67	1.67	0.83	0.83	0.00	2.50
Shruti S.	69.17	51.67	52.50	31.67	12.50	21.67	7.50	0.00	5.00
Darshini	75.83	48.33	38.33	18.33	6.67	7.50	0.83	0.83	0.83
Nidhi	77.50	75.83	58.33	13.33	7.50	10.00	2.50	2.50	4.17

Table 9 shows percentage of errors in stimulus identification for all stimuli display timewise. Individual differences in errors are in the range of about 1 percent to 78 percent. Above data has been shown graphically in the Chart 15 below.

Chart 15 : Subjectwise, displaytimewise percentage of errors overall

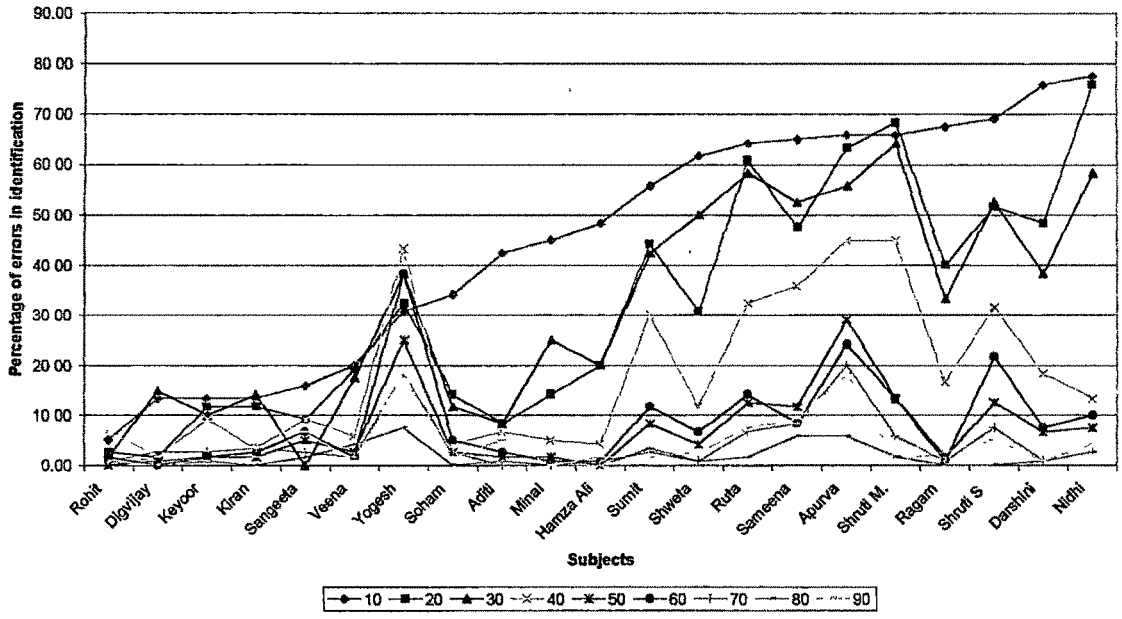


Table 17
Chi-square test for stimulus identification time for all stimuli

frequency * STIMULUS Crosstabulation

		STIMULUS					
		Blank	D	F	4	5	Total
10	Actual	367	286	224	196	306	1379
	Expected	301.5	287.8	252.7	259.0	278.0	1379.0
	Residual	65.5	-1.8	-28.7	-63.0	28.0	
20	Actual	429	355	281	329	315	1709
	Expected	373.7	356.7	313.1	321.0	344.5	1709.0
	Residual	55.3	-1.7	-32.1	8.0	-29.5	
30	Actual	372	370	283	226	348	1599
	Expected	349.6	333.7	293.0	300.3	322.3	1599.0
	Residual	22.4	36.3	-10.0	-74.3	25.7	
40	Actual	476	445	353	430	369	2073
	Expected	453.3	432.6	379.8	389.4	417.9	2073.0
	Residual	22.7	12.4	-26.8	40.6	-48.9	
50	Actual	471	487	482	377	523	2340
	Expected	511.6	488.4	428.8	439.5	471.7	2340.0
	Residual	-40.6	-1.4	53.2	-62.5	51.3	
60	Actual	510	475	380	543	396	2304
	Expected	503.8	480.8	422.2	432.8	464.4	2304.0
	Residual	6.2	-5.8	-42.2	110.2	-68.4	
70	Actual	484	487	502	392	546	2411
	Expected	527.2	503.2	441.8	452.9	486.0	2411.0
	Residual	-43.2	-16.2	60.2	-60.9	60.0	
80	Actual	534	499	413	615	413	2474
	Expected	540.9	516.3	453.3	464.7	498.7	2474.0
	Residual	-6.9	-17.3	-40.3	150.3	-85.7	
90	Actual	444	497	507	403	552	2403
	Expected	525.4	501.5	440.3	451.4	484.4	2403.0
	Residual	-81.4	-4.5	66.7	-48.4	67.6	
Total	Actual	4087	3901	3425	3511	3768	18692
	Expected	4087.0	3901.0	3425.0	3511.0	3768.0	18692.0

Table 18
Chi-square test for stimulus identification time for all stimuli

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Contingency Coefficient	.123	.000
N of Valid Cases		18692	

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Table 10 chi-square test results for all stimuli. Chi-square is highly significant. Thus, the number of correct responses significantly vary with the stimulus display time. Interesting pattern is observed in residuals. Blank screen has difficulty in discrimination at 90, 80, 70 and 50 ms. Whereas Blank screen is well discriminated at 60, 40, 30, 20, and 10 ms. Stimulus D is well discriminated at 30 and 40 ms; whereas discrimination is difficult at 90, 80, 70, 60, 50, 20, and 10 ms. Stimulus F is well discriminated at 90, 70,

and 50 ms; whereas discrimination is difficult at 80, 60, 40, 30, 20, and 10 ms. Stimulus 5 is well discriminated at 90, 70, 50, 30, and 10 ms; whereas discrimination is difficult at 80, 60, 40, and 20 ms. Stimulus 4 is well discriminated at 80, 60, 40, and 20 ms; whereas discrimination is difficult at 90, 70, 50, 30, and 10 ms. Following tables indicate discriminability of each stimuli at each display time and difficulty of discriminability of each stimulus at each display time.

Table 19
Discriminability of stimuli for different display time

	90	80	70	60	50	40	30	20	10
Blank				*		*	*	*	*
4		*		*		*		*	
5	*		*		*		*		*
D						*	*		
F	*		*		*				

Table 20
Difficulty of discriminability of stimuli for different display time

	90	80	70	60	50	40	30	20	10
Blank	*	*	*		*				
4	*		*		*				
5		*		*		*		*	
D	*	*	*	*	*			*	*
F		*		*		*	*	*	*

Thus, hypothesis 5 "There will be no significant differences in correct responses for different stimulus display time for all stimuli" is supported by the data. Whereas null hypothesis "there are significant differences in correct responses for different stimulus display time for all stimuli" is supported by data.

Table 2 shows count and percentage of answer choice indicated by the subject in response to given stimulus. Blank screen was the most correctly identified stimulus, followed by D, 5, F and 4 respectively.

Blank screen was confused maximally with stimulus D. Stimulus D was maximally confused with Blank screen. Stimulus F was maximally confused with stimulus D. Stimulus 4 was maximally confused with stimulus 5. Stimulus 5 was maximally confused with D.

The results indicate that there is variation in correct stimulus identification (Table 2 and Chart 1). According to Neisser (1963), people use features to recognize letters. Therefore, in any choice-reaction task correct stimulus identification will be a function of absolute featural difficulty of the stimuli. Although, it is difficult to explain why blank screen should be difficult to identify, generally choice reaction studies would include stimulus and in such cases certainly stimulus features would be determinant of the stimulus identification difficulty.

Interstingly, pattern of confusion is not always reciprocal. For example, as shown in Chart 2 Blank screen was confused maximally with stimulus D. Stimulus D was maximally confused with Blank screen. Thus, Blank and stimulus D forms a reciprocally confusing stimulus. Whereas for, stimulus D was more confused with stimulus F and stimulus 5 but not vice versa. Similarly stimulus 4 was confused with stimulus 5 but not vice versa. Thus, stimulus identification difficulty arises relatively also, that is, in a choice reaction task confusion of stimulus identification will be dependent on another stimuli included in the choice reaction task. It is also possible that this relative stimulus identification difficulty might interact with absolute stimulus identification dificulty.

When each stimulus detection is seen with respect to display time, as shown in Table 3 and Chart 3, it is obvious that stimulus identification is superior at 80 ms. It is even better than identification at 90 ms. Besides, pattern at lower display time that is below 40 ms is quite systematic but queer. At 30 ms less percentage of correct answer choices that at 20 ms more percentage of correct response which again declines at 10 ms. This means stimulus identification is likely to be influenced significantly by display time in case of discrete choice task wherein SOA is reduced to less than 50 ms.

Stimulus detection errors with respect to display time, as shown in Table 4 and Chart 4, 5, 6, 7, and 8 have variable pattern for each stimuli and display time. Especially

beyond 50 ms there is steep rise in percentage of errors and kind of errors (hence wrong key press). This again supports the above statement that stimulus identification is likely to be influenced significantly by display time in case of discrete choice task wherein SOA is reduced to less than 50 ms.

Table 5 and Chart 9 shows percentage of correct stimulus identification stimuluswise and subjectwise. Tables 6, 7 and 8 and Charts 10, 11, 12, 13, and 14 shows percentage of errors in answer choices for stimulus 4-5, Blank-D, and F for each subject respectively. There are quite apparent differences across stimulus and subjects in terms of correct answer choices and erros in identification. Table 9 and Chart 15 shows percentage of errors in stimulus identification for all stimuli display timewise. Again there are glaring Individual differences in errors of identification.

Conclusion :

Looking at all above results we can safely conclude that follwing factors play very important role stimulus identification, especially at display time less than or equal to 50 ms -

1. Absolute featural difficulty of stimuli
2. Relative featural difficulty of stimuli
3. SOA
4. Individual subjects.

All these factors are either additive or interactive and needs to be taken care of while estimating parameters for simulation or while analysing empirical data. Although SOA interaction with stimulus difficulty has been already examined and explained by SRD model, most studies do not consider individual subject effects at the same time. In fact assumptions about perceptual processors considers transmission time dependency on modality, intensity and discriminability. As above data suggests, discriminability seems to be a function of featural difficulty both absolute and relative and individual especially when SOAs are less than 50 ms. Thus, Stimulus detection time td and Stimulus identification time ti are likely to be influenced by selection of stimulus in choice reaction time and by individual subjects and the same must be taken care of in parameter estimation

Experiment 2

Repetitive Response

This experiment was done to understand nature of motor processes as reflected in repetitive response. Repetitive responses presumably involves minimal cognitive processing. Actual instantiation of repetitive response is constrained by neuro-physiological processes and hence is a major contributor to reaction time measurement and its variability.

Hypothesis related to this experiment are hypothesis 1 "Repetitive response time shall be more for left hand in comparison to right hand response time; hypothesis 2 "Repetitive response time shall be more for middle finger in comparison to index finger; and hypothesis 3 "There will be interaction effect of hand and finger in repetition response time. The objecitve 10 "To understand the trial-to-trial variations in individual performance under different experimental conditions in context of theoretical formulation of EPIC based SRD model of PRP procedures" is related to this experiment.

Table 21 shows Univariate analysis of variance :
Tests of Between-Subjects Effects for Repetitive Response Times

Dependent Variable: EXP2

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Model	135282410[a]	84	1610504.879	2573.749	.000
HAND	767053.920	1	767053.920	1225.829	.000
FINGER	19292.885	1	19292.885	30.832	.000
FNAME	2334358.876	20	116717.944	186.527	.000
HAND * FINGER	35419.379	1	35419.379	56.604	.000
HAND * FNAME	227298.124	20	11364.906	18.162	.000
FINGER * FNAME	30426.932	20	1521.347	2.431	.000
HAND * FINGER * FNAME	66581.551	20	3329.078	5.320	.000
Error	2529252.190	4042	625.743		
Total	137811662	4126			

a. R Squared = .982 (Adjusted R Squared = .981)

Table 21 shows results of Between-Subjects effects on dependent variable repetitive reaction time attained by univariate analysis of variance. All main effects - Hand (right-left), Finger (index-middle) and Fname (subjects) are significant at 0.000 level. Two way interaction between Hand*Finger, Hand*Fname, and Finger*Fname are also significant at 0.000 level. Three-way interaction among Hand*Finger*Fname is also significant at 0.000 level. Thus, repetitive responses are significantly influenced by indepedent variables Hand, Finger and Individual differences and their interaction.

Table 22 shows mean, SD and V of repetitive response for Total, hands, fingers, stimuli and subjects

	Mean	SD	V
Total	178.74	38.11	0.21
Right	165.27	32.73	0.20
Left	192.42	38.32	0.20
Index	176.94	36.65	0.21
Middle	180.58	39.46	0.22
4	166.08	33.41	0.20
5	164.45	32.03	0.19
D	197.18	39.52	0.20
F	187.80	36.55	0.19
Keyoor	152.42	19.85	0.13
Shweta	167.73	24.01	0.14
Veena	194.47	35.63	0.18
Shruti M.	172.18	30.06	0.17
Ruta	177.27	45.70	0.26
Sameena	206.06	39.26	0.19
Minal	169.93	23.86	0.14
Darshini	248.23	31.42	0.13
Rohit	172.58	41.28	0.24
Sumit	154.13	21.54	0.14
Kiran	191.41	22.88	0.12
Aditi	206.73	29.45	0.14
Digvijay	147.35	31.50	0.21
Yogesh	173.88	38.77	0.22
Apurva	187.74	23.98	0.13
Ragam	150.12	30.19	0.20
Sangeeta	157.50	26.85	0.17
Nidhi	212.81	24.86	0.12
Soham	160.23	22.29	0.14
Hamza	185.78	24.38	0.13
Shruti S.	176.28	23.29	0.13

Table 22 and Chart 16 shows mean, SD and V for total, hands (right-left), fingers (index-middle), stimuli (4-5-D-F) and each subject. Repetitive response time of left hand is significantly higher than right hand as can be seen in Table 22 and supported by Table 21. Right hand response time is less than total response time, whereas left hand response time is less than total response time.

Repetitive response time of middle finger is significantly higher than response time of index finger. Again index finger response time is lower than total response time, whereas middle finger response time is higher than total response time. Repetitive response time of stimuli 5 is lowest (right hand middle finger), followed by stimuli 4 (right hand index finger), stimuli F (left hand index finger), and stimuli D (left hand middle finger). Thus, right hand middle finger is faster in comparison to right hand index finger, whereas left hand index finger is faster than left hand middle finger. This seems to be counterintuitive, as both index finger would have been expected to be faster than middle finger. Both stimuli 4 and 5 are faster than total response time, whereas both stimuli D & F are slower than total response time.

Individually Digvijay is the fastest respondent with mean reponse time of 147.35 ms, whereas Darshini is the slowest respondent with mean response time of 248.23 ms. The difference between this two response time is 101 ms.

Highest standard deviation has been observed in case of Ruta (45.70 ms) whereas lowest standard deviation is observed in case of Keyoor (19.85 ms). Interestingly, V for all independent factors have not remained 0.2 as reported in most of the empirical studies and which has been base of parameter estimation in SRD simulation.

Chart 16 : Mean & SD of Repetitive Response

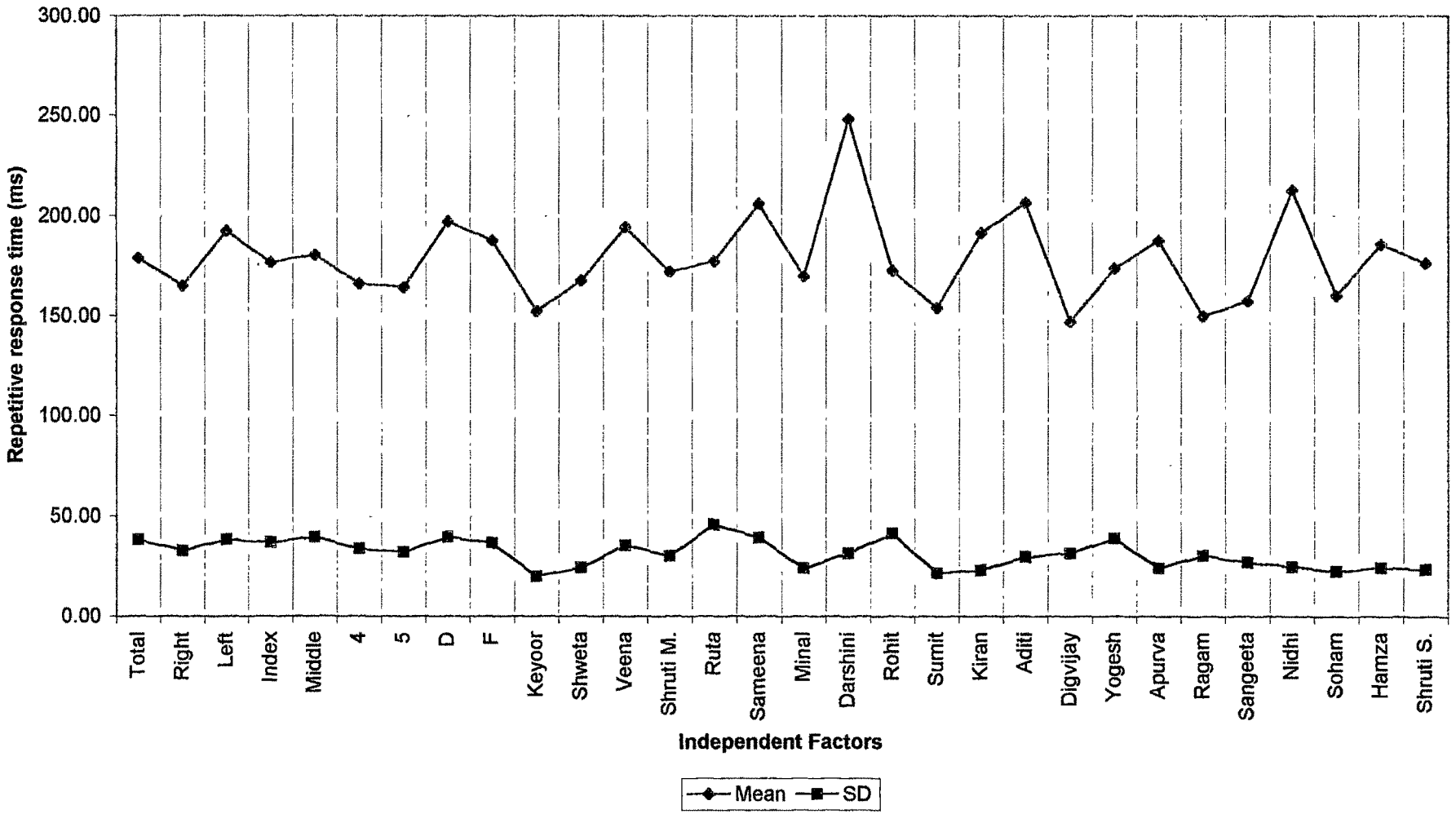


Table 23 frequency distribution of repetitive response times for Total, hands, fingers, and stimuli

RT	Total	Right	Left	Index	Middle	4	5	D	F
78	7	5	2	2	5	2	3	2	
93	1	1			1		1		
109	118	90	28	56	62	37	53	9	19
110	64	53	11	35	29	30	23	6	5
125	91	62	29	50	41	34	28	13	16
140	219	160	59	107	112	76	84	28 .	31
141	377	270	107	198	179	134	136	43	64
156	673	435	238	365	308	221	214	94	144
157	232	154	78	117	115	76	78	37	41
171	19	10	9	10	9	5	5	4	5
172	121	75	46	66	55	39	36	19	27
187	645	276	369	334	311	145	131	180	189
188	654	283	371	329	325	138	145	180	191
203	40	11	29	23	17	6	5	12	17
204	11	3	8	8	3	2	1	2	6
218	106	29	77	50	56	12	17	39	38
219	271	59	212	125	146	23	36	110	102
234	141	30	111	60	81	17	13	68	43
235	87	20	67	37	50	9	11	39	28
250	72	15	57	29	43	9	6	37	20
265	59	14	45	25	34	9	5	29	16
266	73	15	58	37	36	11	4	32	26
281	5	2	3	2	3		2	1	2
296	5	1	4	3	2	1		2	2
297	29	4	25	10	19	4		19	6
313	4	1	3	1	3		1	2	1
328	2		2	1	1			1	1
Total	4126	2078	2048	2080	2046	1040	1038	1008	1040

Table 23, Table 24 and Chart 17, Chart 18, Chart 19, Chart 20, and Chart 21 shows frequency distribution of repetitive response times for total, hands, fingers, stimuli and subjects respectively. Obviously, each distribution is multimodal. The frequency and pattern differences are indicative of differences in stochastic processes of physiological processes implemented in each reponse.

Table 24 frequency distribution of repetitive response times for each subject

	Keyoor	Shweta	Veena	Shruti M	Ruta	Sameena	Minal	Darshini	Rohit	Sumit	Kiran	Aditi	Digvijay	Yogesh	Apurva	Ragam	Sangeeta	Nidhi	Soham	Hamza	Shruti S
78					1	1		1	2					3							
93																					
109	8	2		2	17	1	1		13	7		1	26	8		20	10		2		
110	6			3	13				4	4			11	7		7	7		1		1
125	7	3		8	7		4	1	9	4			15	2		14	9		7		1
140	20	21	8	9	5	2	10		12	20	1		19	7	1	26	19	1	20	8	10
141	32	23	11	18	10	7	24	1	18	36	11	1	37	20	10	31	29		37	7	14
156	73	41	18	43	23	17	47		25	69	9	2	51	37	17	53	50		52	19	29
157	23	17	8	13	12	5	11		9	25	2	3	18	8	6	21	16		18	5	12
171	1			2	1		2						1	2	1		3	1	1	3	1
172	5	5	4	5	2	5	12		13	8	9	5	1	5	8	2	1	4	3	12	12
187	12	37	35	39	30	22	37	2	28	15	58	51	6	23	58	5	21	33	29	50	54
188	12	42	31	34	19	25	40		31	9	57	44	5	31	58	11	28	37	26	62	52
203		1	4	1	5	6	1		2		2	2		2	3		2	4	2	2	1
204			2	1	2	2					2							1		1	
218		1	4	3	1	13		12	3		12	13		9	7		1	20		6	1
219		2	17	8	19	30	8	27	8		24	33	4	15	14	2	2	42	1	8	7
234		4	17	2	13	15	2	14	7		9	12		5	6	1		23		8	3
235	1	1	5	3	6	8		16	4	1	3	13		4	3			14		5	
250			7	2	6	4		26	2			4	1	2	2	3	1	8		4	
265			2	2	4	8	1	26	3		1	5	1	2				3	1		
266			4	1	2	8		31	3			6	3	2	1	2	1	9			
281						1		2	1						1						
296					1			2		1		1									
297			1		1	5		14	1			3	1	1		1					1
313						1		2	1												
328			1					1													
	200	200	177	199	200	186	200	178	199	199	200	199	200	195	196	199	200	200	200	200	199

Chart 17 : Frequency distribution of repetitive response time - total

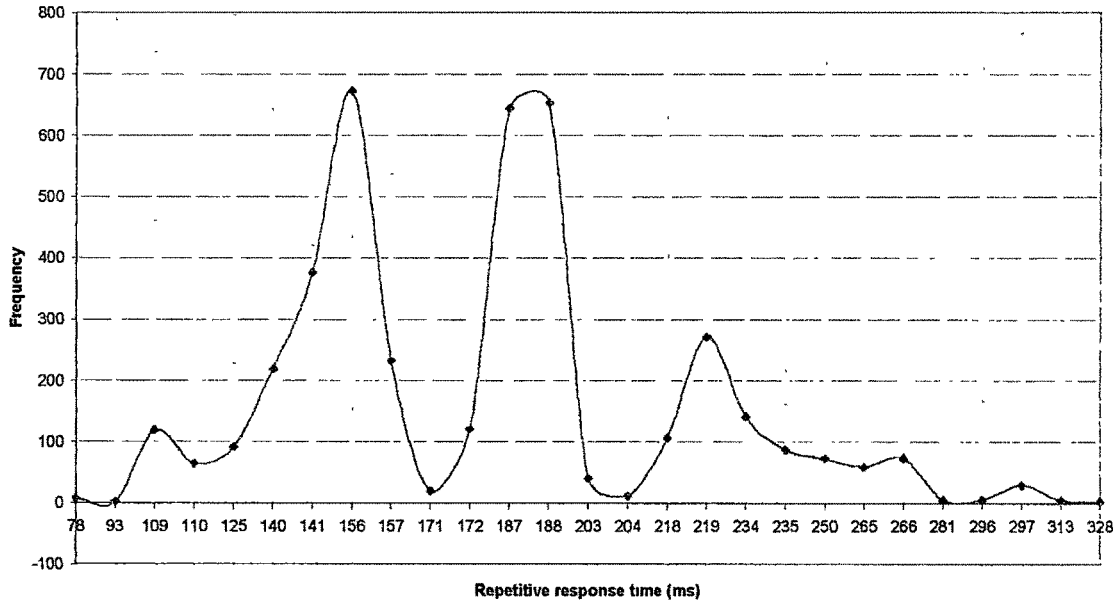


Chart 18 : Frequency distribution of repetitive response times - handwise

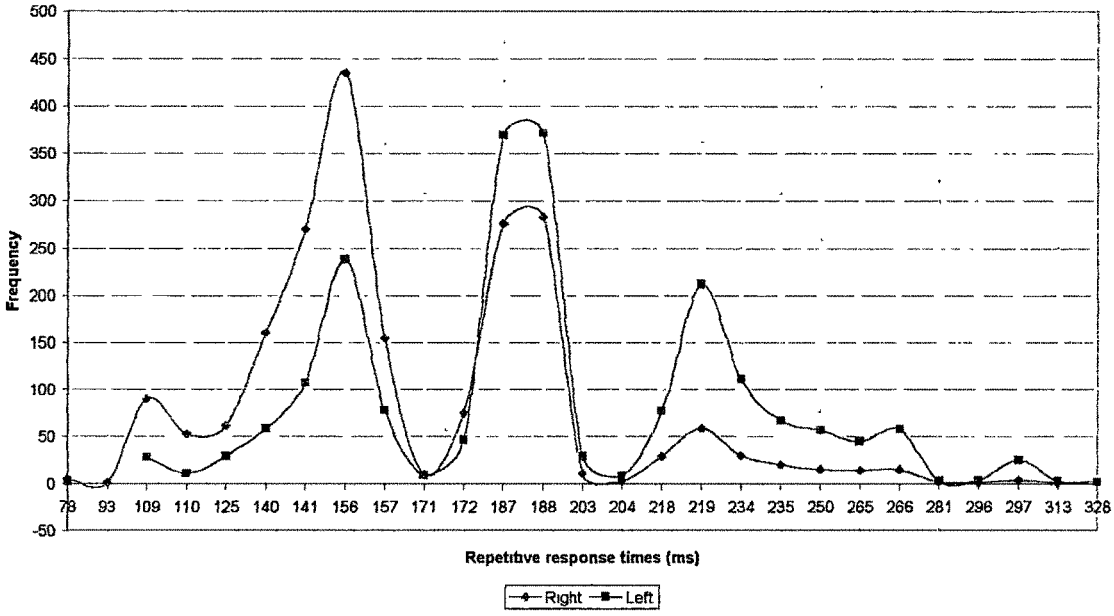


Chart 19 : Frequency distribution of repetitive response times - fingerwise

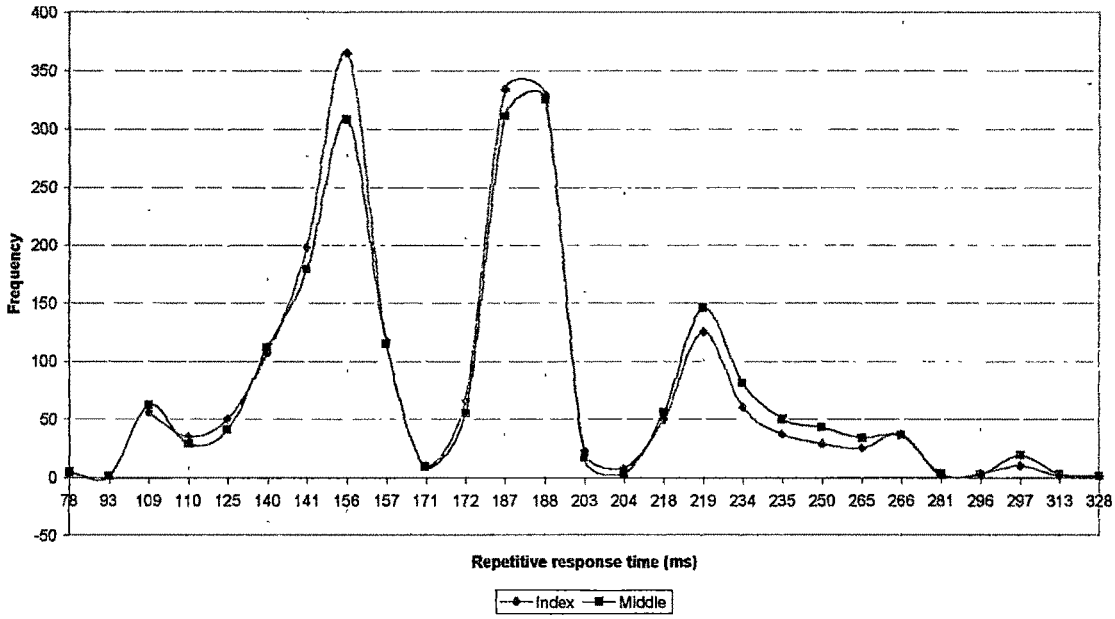


Chart 20 : Frequency distribution of repetitive response time - stimuliwise

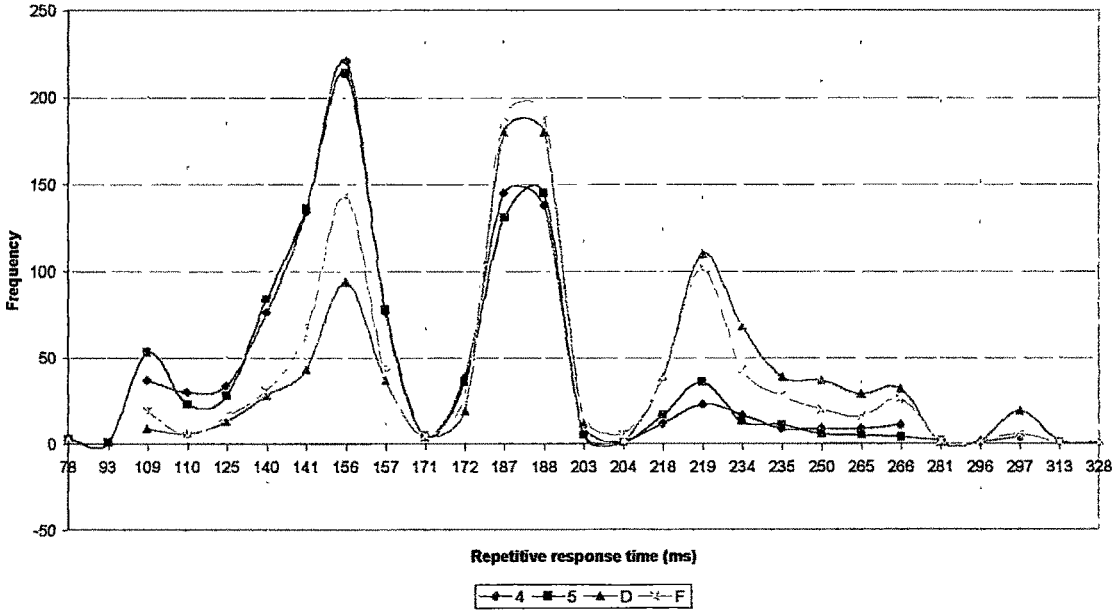
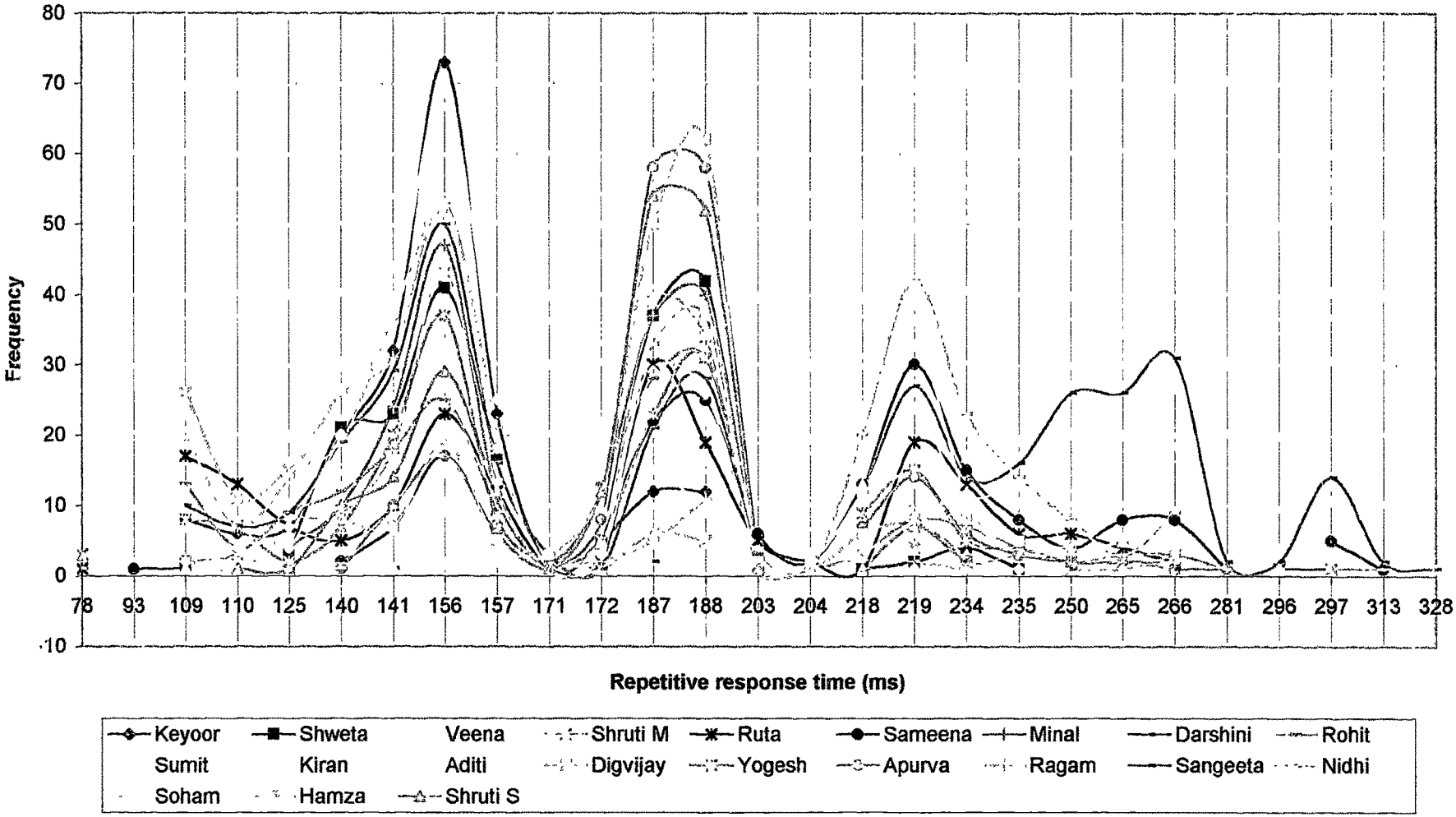


Chart 21 : Frequency distribution of repetitive response times - subjectwise



Conclusion :

Table 21, Table 22 and Chart 16 provides evidence for -

hypothesis 1 "Repetitive response time shall be more for left hand in comparison to right hand response time",

hypothesis 2 "Repetitive response time shall be more for middle finger in comparison to index finger", and

hypothesis 3 "There will be interaction effect of hand and finger in repetition response time.

Thus, all the three hypothesis are retained. Besides, Table 23, Table 24 and Chart 17-21 are indicative of variations in response times as determined by hands, fingers, stimuli and subjects and so they provide support for the objecitve 10 "To understand the trial-to-trial variations in individual performance under different experimental conditions in context of theoretical formulation of EPIC based SRD model of PRP procedures".

Experiment 3

Simple Reaction Time - Single Response

This experiment was done to understand nature of combined motor processes and cognitive processes as reflected in simple reaction time studies. Simple reaction time presumably involves both cognitive processing and motor processing along with actual instantiation of response.

There is no specific hypothesis related to this experiment. The objecitve 10 "To understand the trial-to-trial variations in individual performance under different experimental conditions in context of theoretical formulation of EPIC based SRD model of PRP procedures" is related to this experiment.

Table 25 shows Univariate analysis of variance : Tests of Between-Subjects Effects for Simple Reaction Time - Single Response

Dependent Variable: EXP3S

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Model	533856334[a]	84	6355432.547	839.960	.000
HAND	35833.143	1	35833.143	4.736	.030
FINGER	3731.547	1	3731.547	.493	.483
FNAME	6691078.700	20	334553.935	44.216	.000
HAND * FINGER	105681.958	1	105681.958	13.967	.000
HAND * FNAME	767292.101	20	38364.605	5.070	.000
FINGER * FNAME	465838.614	20	23291.931	3.078	.000
HAND * FINGER * FNAME	262354.038	20	13117.702	1.734	.022
Error	28964008.0	3828	7566.355		
Total	562820342	3912			

a. R Squared = .949 (Adjusted R Squared = .947)

Table 25 shows results of Between-Subjects effects on dependent variable repetitive reaction time attained by univariate analysis of variance. Main effects - Hand (right-left), and Fname (subjects) are significant at 0.03 and 0.000 level respectively. Whereas main effect Finger (index-middle) is not significant. Two way interaction between Hand*Finger, Hand*Fname, and Finger*Fname are also significant at 0.000 level. Three-way interaction among Hand*Finger*Fname is also significant at 0.022 level. Thus, simple reaction time - single responses are significantly influenced by independent variables Hand and Individual differences and their interactions including interaction with finger.

Table 26 shows mean, SD and V of simple reaction time - single response for Total, hands, fingers, stimuli and subjects

	Mean	SD	V
Total	366.35	98.28	0.27
Right	361.73	96.36	0.27
Left	371.20	100.05	0.27
Index	368.74	98.67	0.27
Middle	364.03	97.87	0.27
4	369.55	97.52	0.26
5	353.88	94.59	0.27
D	374.34	100.09	0.27
F	367.86	99.96	0.27
Keyoor	303.94	80.43	0.26
Shweta	335.19	92.99	0.28
Veena	335.03	66.52	0.20
Shruti M.	374.16	85.55	0.23
Ruta	392.08	99.76	0.25
Sameena	326.53	80.04	0.25
Minal	362.30	72.08	0.20
Darshini	441.23	96.55	0.22
Rohit	392.01	69.43	0.18
Sumit	342.67	75.20	0.22
Kiran	392.20	113.69	0.29
Aditi	337.91	79.49	0.24
Digvijay	317.09	81.21	0.26
Yogesh	411.65	100.38	0.24
Apurva	436.25	104.23	0.24
Ragam	338.64	81.28	0.24
Sangeeta	388.41	109.44	0.28
Nidhi	416.74	107.66	0.26
Soham	309.05	75.05	0.24
Hamza	319.41	70.90	0.22
Shruti S.	428.32	103.03	0.24

Table 26 and Chart 22 shows mean, SD and V for total, hands (right-left), fingers (index-middle), stimuli (4-5-D-F) and each subject. Simple reaction time - single response of left hand (371.20 ms) is significantly higher than right hand (361.73 ms) as can be seen in Table 26 and supported by Table 25. Right hand response time is less than total reponse time (366.35), whereas left hand response time is more than total reponse time.

Simple reaction time - single response of index finger (368.74 ms) is not significantly different from middle finger (364.03). Index finger response time is more than total response time, whereas middle finger response time is less than total response time. Simple reaction time - single response of stimuli 5 is lowest (right hand middle finger), followed by stimuli F (left hand index finger), stimuli 4 (right index finger), and stimuli D (left hand middle finger). Thus, right hand middle finger is significantly faster than right hand index finger, left hand index finger as well as left hand middle finger. Whereas left hand index is significantly faster than left hand middle finger.

Individually, Keyoor is the fastest respondent with mean response time of 303.94 ms, whereas Darshini is the slowest respondent with mean response time of 441.23 ms. The difference between this two response time is 137.29 ms.

Highest standard deviation has been observed in case of Kiran (113.69 ms), whereas lowest standard deviation has been observed in case of Veena (66.52 ms). Coefficient of Variation for all independent factors and almost all subject, except Rohit has remained 0.2.

Chart 22 : Mean & SD of Simple Reaction Time - Single Response

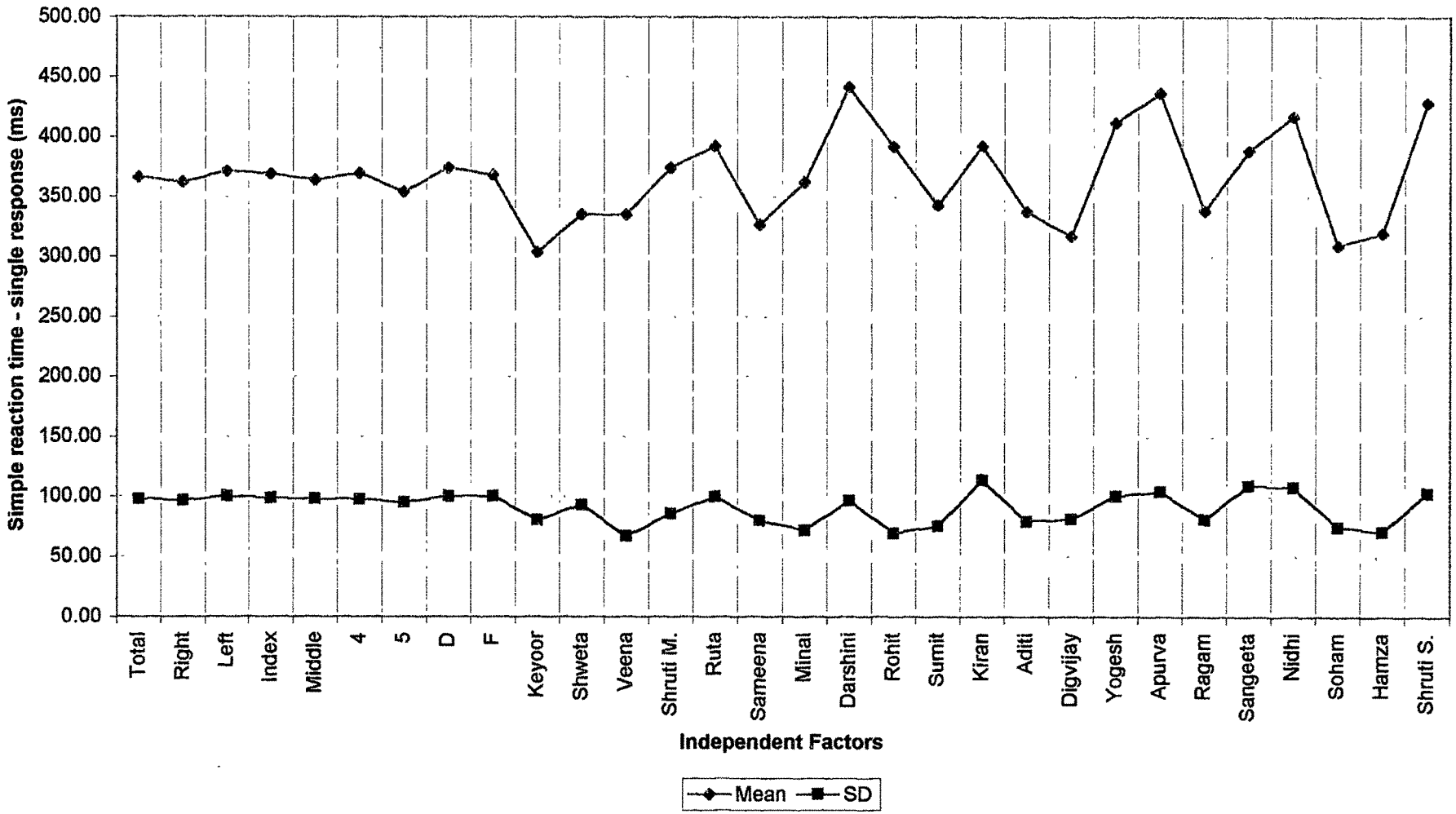


Table 27 shows frequency distribution of simple reaction time - single response for Total, hands, fingers, and stimuli

RT	Total	Right	Left	Index	Middle	4	5	D	F
109	1	1			1		1		
140	1		1	1					1
141	1		1	1					1
172	4	2	2	1	3		2	1	1
187	2	1	1	1	1	1		1	
188	6	4	2	2	4		4		2
203	6	1	5	5	1	1		1	4
218	25	17	8	12	13	7	10	3	5
219	68	45	23	32	36	20	25	11	12
234	8	2	6	4	4	1	1	3	3
235	6	4	2	1	5	1	3	2	
250	246	152	94	112	134	62	90	44	50
265	77	41	36	34	43	16	25	18	18
266	153	87	66	77	76	46	41	35	31
281	181	100	81	86	95	46	54	41	40
282	55	37	18	27	28	18	19	9	9
296	62	36	26	33	29	20	16	13	13
297	411	182	229	198	213	86	96	117	112
312	31	12	19	20	11	8	4	7	12
313	36	15	21	14	22	7	8	14	7
328	463	231	232	224	239	112	119	120	112
329	57	31	26	30	27	17	14	13	13
343	27	7	20	17	10	4	3	7	13
344	95	38	57	49	46	19	19	27	30
359	155	85	70	73	82	38	47	35	35
360	98	52	46	48	50	26	26	24	22
375	269	136	133	133	136	68	68	68	65
390	36	15	21	13	23	6	9	14	7
391	67	40	27	43	24	29	11	13	14
406	225	110	115	111	114	60	50	64	51
407	79	41	38	33	46	17	24	22	16
421	8	3	5	5	3	2	1	2	3
422	22	13	9	12	10	7	6	4	5
437	112	58	54	57	55	34	24	31	23
438	86	48	38	37	49	25	23	26	12
453	76	32	44	44	32	19	13	19	25
454	11	7	4	4	7	4	3	4	
468	16	11	5	9	7	5	6	1	4
469	62	33	29	29	33	16	17	16	13
484	68	34	34	33	35	18	16	19	15
485	54	27	27	37	17	23	4	13	14
500	25	15	10	13	12	9	6	6	4
515	35	22	13	15	20	9	13	7	6
516	73	41	32	33	40	19	22	18	14
531	17	4	13	8	9	2	2	7	6
532	6	2	4	2	4	1	1	3	1
546	12	6	6	7	5	4	2	3	3
547	59	30	29	34	25	17	13	12	17
562	19	8	11	9	10	4	4	6	5
563	29	14	15	17	12	9	5	7	8
578	20	16	4	13	7	11	5	2	2
579	2	1	1	1	1		1		1
593	19	5	14	13	6	3	2	4	10
594	33	13	20	13	20	7	6	14	6
609	4	1	3	1	3	1		3	
610	3	2	1	2	1	1	1		1
625	35	14	21	14	21	6	8	13	8
640	5	2	3	3	2	1	1	1	2
641	8	1	7	6	2	1		2	5
656	4	1	3	2	2		1	1	2
657	4	1	3	2	2	1		2	1
671	1	1			1		1		
672	12	5	7	8	4	4	1	3	4
688	6	3	3	5	1	2	1		3
703	14	4	10	4	10	3	1	9	1
704	1	1			1		1		
Total	3912	2004	1908	1927	1985	1004	1000	985	923

Table 28 shows frequency distribution of simple reaction time - single response for Total, hands, fingers, and stimuli

	Keyoor	Shweta	Veena	Shruti M.	Ruta	Sameena	Milind	Darshini	Rohit	Sumit	Kiran	Aditi	Digvijay Singh	Yogesh	Apurva	Regam	Sangeeta	Nidhi	Soham	Hamza Ali	Shruti S
109													1									
140																						
141	1												1									
172	1		1										1			1						
187													1			1				1		
188	3												1									
203	4												2									
218	6	4	1			1			1		1	2				1	1		2	4	2	
219	19	7				1				2	3	6	11			1	2		10	4		
234	2	2				2					1									1		
235	1	1			1	3																
250	27	16	11	10	1	12	3			10	13	18	30	1	4	15	13	2	26	30	2	
266	4	14	1	1	6	16	1			4	1	3	5	1		2	3	1	6	5		
268	12	13	12		6	31	10	2	1	7	4	11	12			6	2		11	11	1	
281	10	1	17	14	2	1	3	2	3	19	8	8	23	3	2	23	12	8	6	11	2	
282	6	1	3	3						4	5	2	4		1	11		6	3	5		
296	1	3	7	3	2	9	1	1	1	6	2	3		3	1	6	2	1	4	4	2	
297	15	33	24	8	28	37	34	5	6	26	16	23	14	13	12	26	15	14	19	29	11	
312	2	1	1	3	2	7	4		2			1				1	5	2				
313	2	1		5	4	4	11	1		1		1		1			2			1	2	
328	21	19	31	36	10	8	18	13	29	34	27	26	25	19	15	25	14	29	15	28	19	
329	3	2	7	2	1	1	1	3	2	3	2	6	3	3	1	4	4	4	1	2	2	
343			1	1	8	4	2		2	2				2			2		1	1		1	
344		5	2	2	19	10	14	5	5	4	2	4	2	7	2		4	11	2	5	1	
359	3	2	9	16	3	1	3	6	16	4	6	9	9	11	7	14	4		2	9	10	
360	2	7	8	12				3	7	8	4	4	5	4	2	8	2	5	3	6	6	
376	4	10	9	9	19	11	34	14	20	12	8	18	7	21	15	9	5	4	9	18	15	
390	4	1	2	1	1			1	4	1	3	4	1	1	2		4	2	2		2	
391	8	1	2	8	1	3	1	4	10		1	5	2	2	2	7	4	6	2	2		
406	3	10	10	9	11	7	11	18	22	14	6	10	10	19	19	6	9	5	6	5	16	
407	3		1	2	3	4	7	2	12	2	5	2	5	5	6	2	1	4	5	5	5	
421		1		1	2				1					1	2							
422	1		1	3	4	1	4	1	2		1		1		1	1	1	1			1	
437	4	1	2	14	3	2	4	6	8	5	9	5	2	4	6	4	6	13		3	11	
438	6	3	4	6	1		1	12	8	4	1	3	5	6	3	5	5	9	1		6	
453	2	3	3		11	5	8	6	5	1	3	1	3		6		6	2		3	7	
454	1					1	2	1	1		1				2		1				1	
468	1			1				2		1	4	1	1	1		4	1	1		2		
469		2	4	2			1	7	4	3	8	1	2	2	4	4	5	6			7	
484		2		2	3	2	3	9	4	1	2	3	1	7	9	1	7	5			7	
485	1	3	2	1	5	4	2	3	4	2	2	1	1	4	8		6	2		1	1	
500				7	3		2	1	1		1			2			2	4			2		
515		1	3	1		1		5			3	3		2	7			6	1		2		
516	3	5		1	5	1	4	8	3	2	6			8	5		6	6	3		6		
531		2			6	1	3	2	2												1		
532					1										1		3				1		
548				1				1			3	1		1			1	2			2		
547	1	2	2	4	1	1	1	6	2	4	4		1	5	2	2	2	10	1	1	7	
562				1	1	2	1	1		1	3		1	1	3		1			1	3	
563		1			3	1	1	2	1				1	3	5		3	3		1	3	
578	1			1				4			1			3	1	2	2	2			1		
579				1							1												
593					4			2			3			1	2	2	2				3		
594		1		2	4	1	1	2		1	4	1	2	2	5			3		1	4	
609															2			1				
610				1	1												1					
625				3				8	2	1	3			3	2	2	4	4		1	3	
640		1			1										1			1				
641		1			2			1						1	2			1				
656					1	1		1						1				1			2	
657											1				1		1	1				
671															1						1	
672		1			1				1		2	1		1	2	1					2	
688									1		1							3	1			
703								4				1		4	1		2				2	
704													1		1							
	185	186	161	195	191	197	197	172	185	189	168	193	185	176	175	195	177	191	149	199	183	

Chart 23 : Frequency distribution of simple reaction time - single response - total

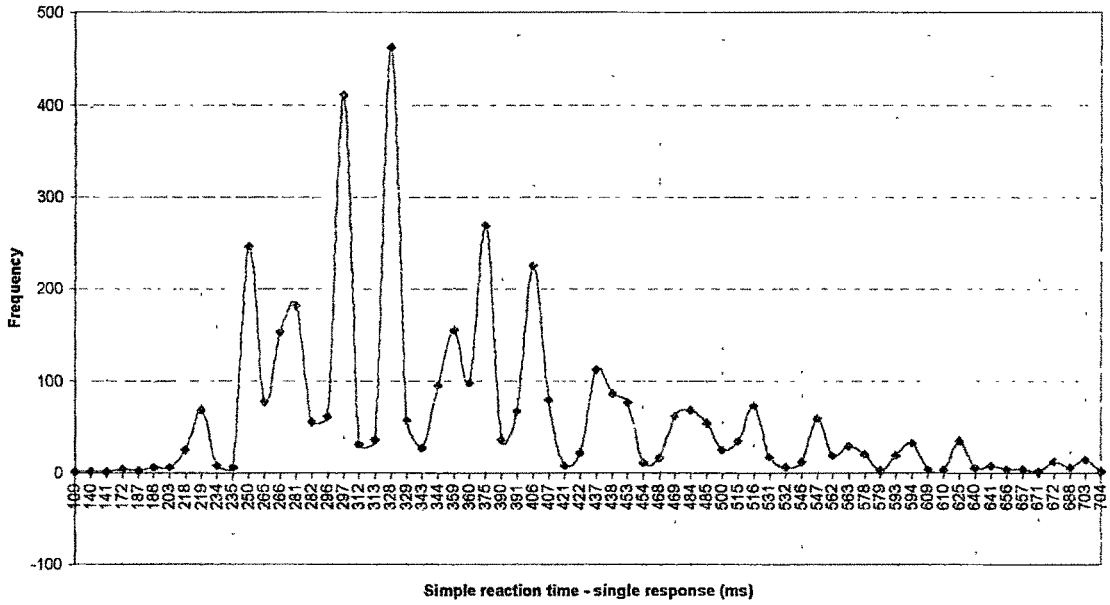


Chart 24 : Frequency distribution of simple reaction time - single response - handwise

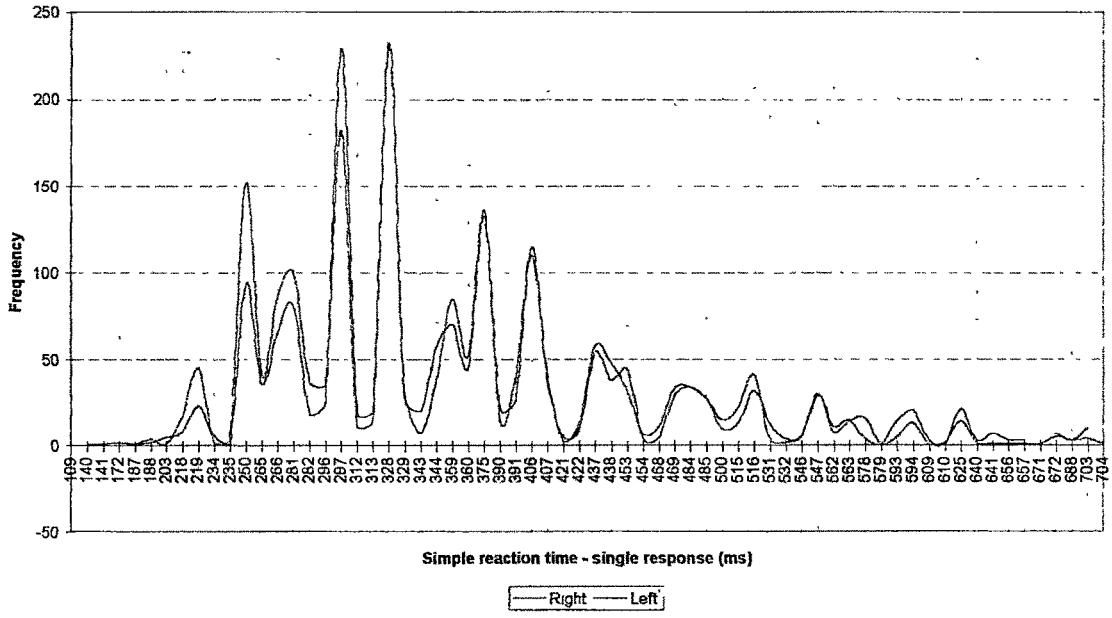


Chart 25 : Frequency distribution of simple reaction time - single respnse - fingerwise

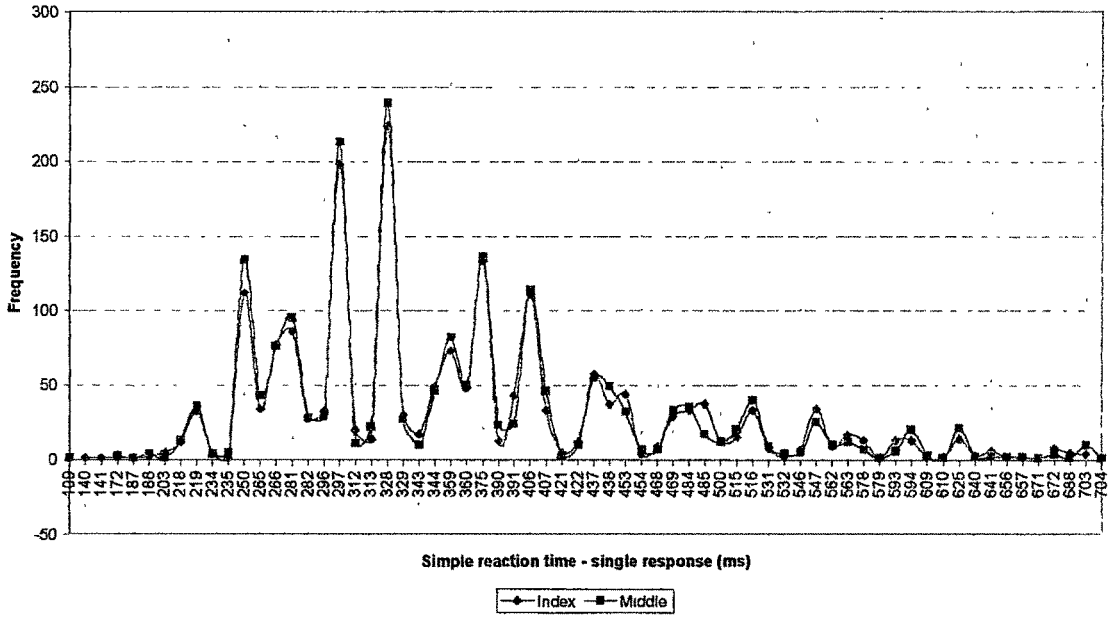


Chart 26 : Frequency distribution of simple reaction time - single respnse - stimuliwise

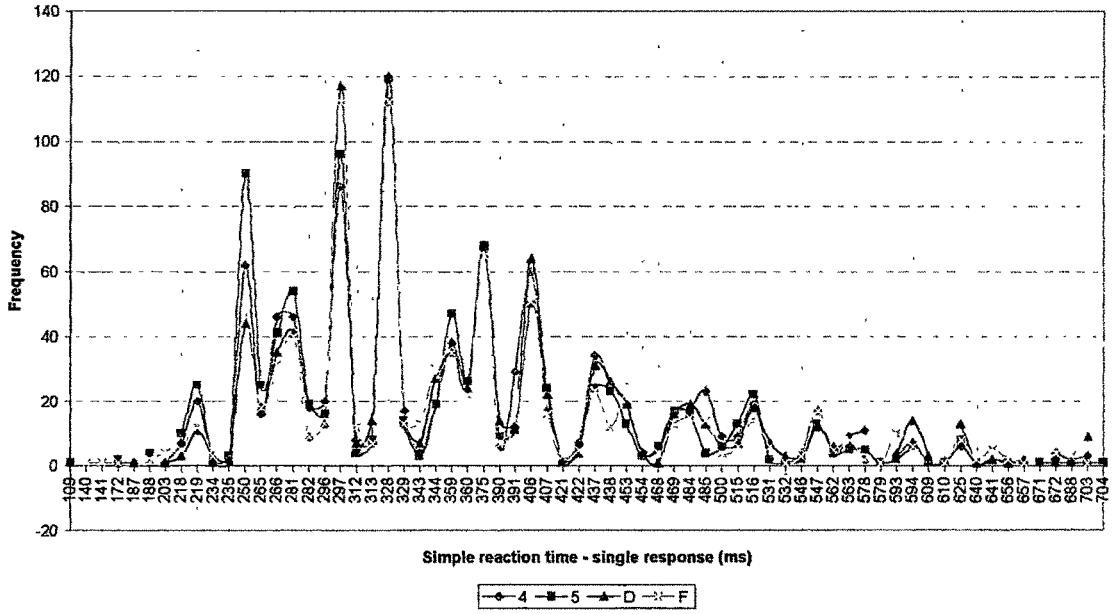


Chart 27 : Frequency distribution of simple reaction time - single response - subjectwise

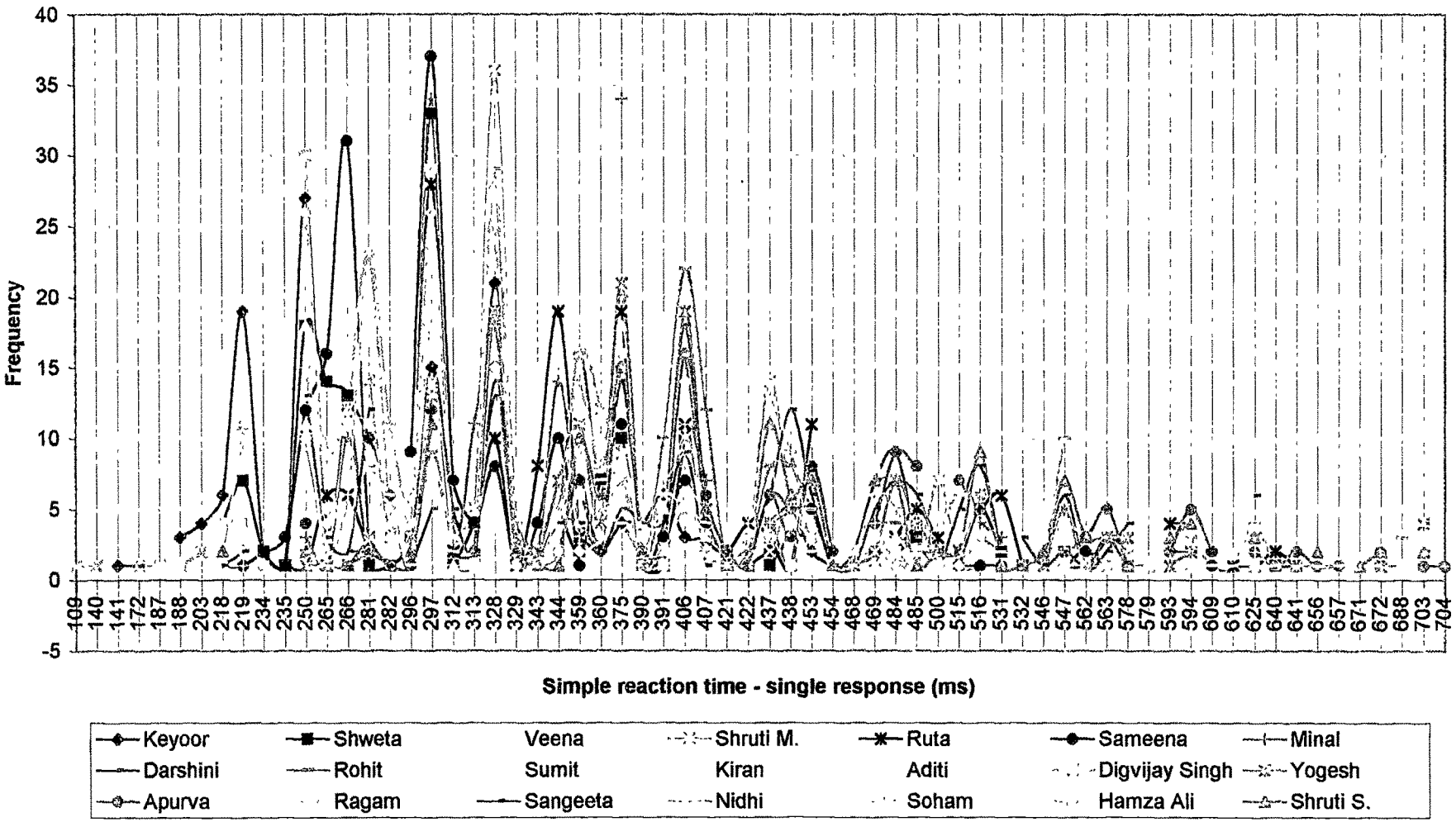


Table 27, Table 28 and Chart 23, Chart 24, Chart 25, Chart 26 and Chart 27 shows frequency distribution of simple reaction time - single response times for total hands, fingers, stimuli and subjects respectively. Each distribution is multimodal. The frequency and pattern differences are indicative of differences in stochastic processes of cognitive and motor processes along with physiological processes implemented in each response.

Conclusion :

As indicated by results, frequency distribution of response times on different independent factors is different from what was obtained in Experiment 1. In fact both finger and hand responses are almost overlapping in modality whereas subjectwise differences are distinctly different from Experiment 1. Even temporal distribution of responses has stretched from 109 - 704 ms. Out of 596 possible numerical value across the range of 109 - 704 only 66 numerical values have been implemented in instantiation of response. Whereas in case of Experiment 1 temporal range was 78 - 328 ms. Out of 251 possible numerical value across the range of 78 - 328 only 27 numerical values has been implemented in instantiation of response. This data provides support for the objective 10 "To understand the trial-to-trial variations in individual performance under different experimental conditions in context of theoretical formulation of EPIC based SRD model of PRP procedures".

Experiment 3

Simple Reaction Time - Double Response

This experiment was done to understand how repetitive response shall be influenced by immediately preceding simple reaction time related processes. This experiment includes both Experiment 2 : Repetitive response and Experiment 3 : Simple Reaction Time - Single Response. As this experiment has yielded two reaction times - first simple reaction time and second repeat response time, both reactions times have been analysed here. First reaction has been termed as Simple Reaction Time - Simple and second reaction has been termed as Simple Reaction Time - Repeat.

Hypothesis related to this experiment is hypothesis 4 "Second response time of Experiment 3 shall be same as the repetitive response time of the respective stimuli." The objecitve 10 "To understand the trial-to-trial variations in individual performance under different experimental conditions in context of theoretical formulation of EPIC based SRD model of PRP procedures" is related to this experiment.

Table 29 shows Univariate analysis of variance : Tests of Between-Subjects Effects for Simple Reaction Time - Simple

Dependent Variable: EXP3D1

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Model	533195025[a]	84	6347559.827	858.146	.000
HAND	312284.756	1	312284.756	42.219	.000
FINGER	58856.798	1	58856.798	7.957	.005
FNAME	9167567.688	20	458378.384	61.970	.000
HAND * FINGER	67898.559	1	67898.559	9.179	.002
HAND * FNAME	915626.060	20	45781.303	6.189	.000
FINGER * FNAME	219135.765	20	10956.788	1.481	.077
HAND * FINGER * FNAME	513115.605	20	25655.780	3.468	.000
Error	28795845.5	3893	7396.826		
Total	561990871	3977			

a. R Squared = .949 (Adjusted R Squared = .948)

Table 21 shows results of Between-Subjects effects on dependent variable Simple Reaction Time - Simple reaction time attained by univariate analysis of variance. Main effects - Hand (right-left), Finger (index-middle) and Fname (subjects) are significant at 0.000, 0.005 and 0.000 level respectively. Two way interaction between Hand*Finger, Hand*Fname are also significant at 0.000, and 0.002 respectively. Two way interaction between Finger*Fname is not significant. Three-way interaction among Hand*Finger*Fname is significant at 0.000 level. Thus, simple reaction time - simple responses are significantly influenced by indepedent variables Hand, Finger and Individual differences and their interactions except interaction between Finger*Fname.

Table 30 shows mean, SD and V of simple reaction time - Simple for Total, hands, fingers, stimuli and subjects

	Mean	SD	V
Total	362.29	100.30	0.28
Right	353.65	94.88	0.27
Left	370.95	104.76	0.28
Index	358.57	101.50	0.28
Middle	366.02	98.97	0.27
4	354.26	96.52	0.27
5	353.03	93.25	0.26
D	379.03	102.80	0.27
F	362.89	106.13	0.29
Keyoor	326.57	72.17	0.22
Shweta	280.60	53.21	0.19
Veena	361.94	71.84	0.20
Shruti M.	325.09	74.03	0.23
Ruta	425.89	124.71	0.29
Sameena	322.98	59.13	0.18
Minal	353.68	63.05	0.18
Darshini	439.97	116.05	0.26
Rohit	375.50	65.11	0.17
Sumit	344.16	96.74	0.28
Kiran	404.95	131.44	0.32
Aditi	331.57	74.64	0.23
Digvijay	314.74	73.40	0.23
Yogesh	381.41	106.03	0.28
Apurva	455.74	117.52	0.26
Ragam	301.32	66.71	0.22
Sangeeta	386.26	111.09	0.29
Nidhi	394.00	89.73	0.23
Soham	341.45	73.34	0.21
Hamza	313.44	63.00	0.20
Shruti S.	428.65	92.46	0.22

Table 30 and Chart 28 shows mean, SD and V for total, hands (right-left), fingers (index-middle), stimuli (4-5-D-F) and each subject. Simple reaction time - simple response of left hand (370.95 ms) is significantly higher than right hand (353.65 ms) as can be seen in Table 30 and supported by Table 29. Right hand response time is less than total reponse time (362.29), whereas left hand response time is more than total reponse time.

Simple reaction time - simple response of index finger (358.57 ms) is significantly different from middle finger (366.02). Index finger response time is less than total response time, whereas middle finger response time is more than total response time. Simple reaction time - simple response of stimuli 5 is lowest (353.03 - right hand middle finger), followed by stimuli 4 (354.26 - right index finger), stimuli F (362.89 - left hand index finger), and stimuli D (379.03 - left hand middle finger). Thus, right hand fingers are significantly faster than left hand fingers.

Individually, Shweta is the fastest respondent with mean response time of 280.60 ms, whereas Apurva is the slowest respondent with mean response time of 455.74 ms. The difference between this two response time is 175.14 ms.

Highest standard deviation has been observed in case of Kiran (131.44 ms), whereas lowest standard deviation has been observed in case of Shweta (53.21 ms). Coefficient of Variation for all independent factors and almost all subject has again become varied.

Chart 28 : Mean & SD of Simple reaction time - Simple

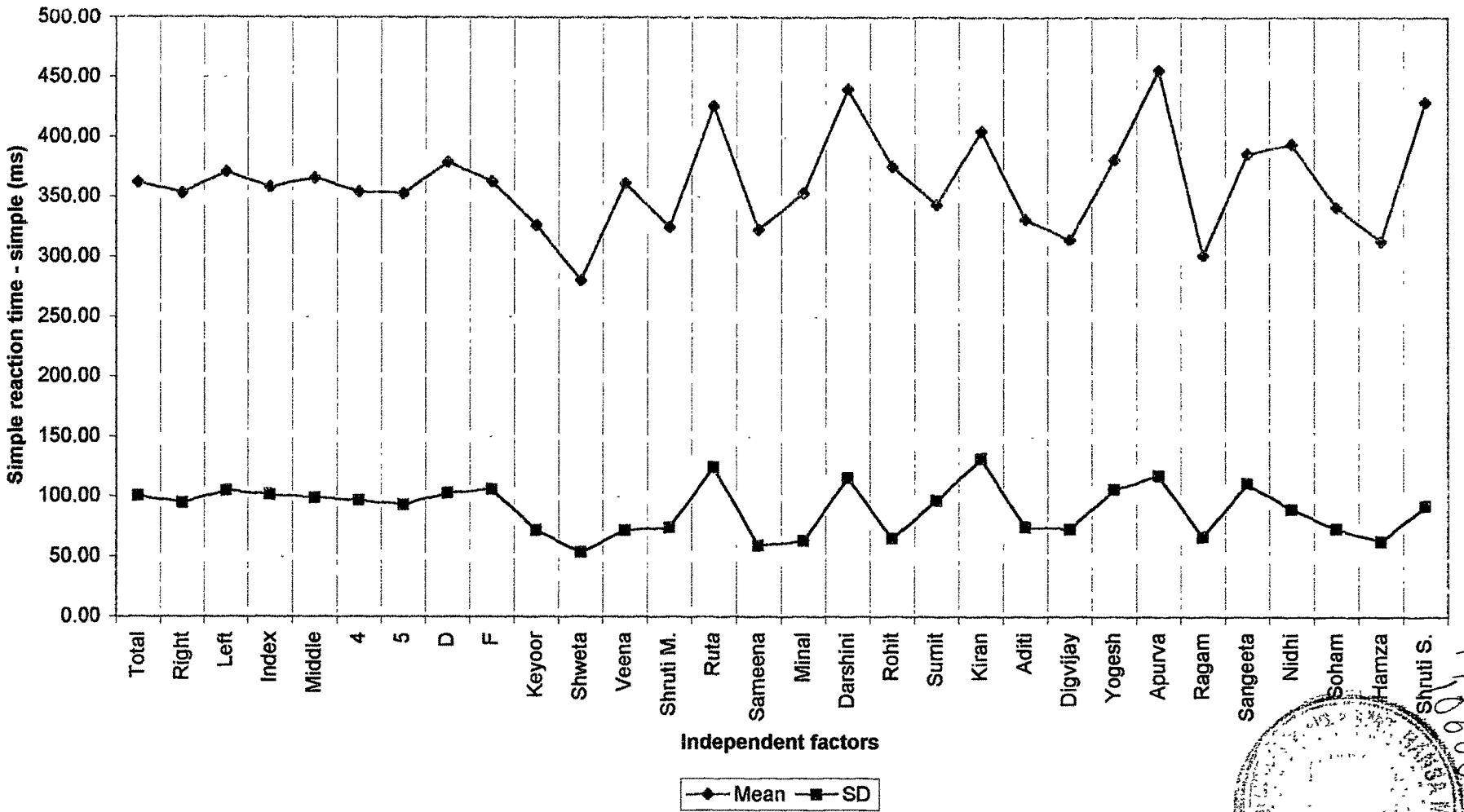


Table 31 shows frequency distribution of simple reaction time - simple response for Total, hands, fingers, and stimuli

RT	Total	Right	Left	Index	Middle	4	5	D	F
109	1		1	1					1
125	1		1		1			1	
140	1		1	1					1
141	2		2	2					2
156	1		1	1					1
157	1	1		1		1			
171	1		1		1			1	
172	3	1	2	2	1		1		2
187	3	1	2	2	1	1		1	1
188	2		2	2					2
203	3	3		2	1	2	1		
204	1	1		1		1			
218	11	6	5	7	4	3	3	1	4
219	58	36	22	33	25	18	18	7	15
234	11	6	5	6	5	4	2	3	2
235	14	8	6	8	6	4	4	2	4
250	248	163	85	140	108	82	81	27	58
265	74	40	34	38	36	20	20	16	18
266	110	56	54	59	51	30	26	25	29
281	150	85	65	82	68	48	37	31	34
282	70	44	26	33	37	20	24	13	13
296	80	35	45	41	39	19	16	23	22
297	506	247	259	272	234	123	124	110	149
312	36	13	23	13	23	5	8	15	8
313	46	23	23	23	23	12	11	12	11
328	541	280	261	247	294	135	145	149	112
329	86	51	35	38	48	20	31	17	18
343	38	14	24	19	19	5	9	10	14
344	113	43	70	69	44	29	14	30	40
359	191	109	82	84	107	45	64	43	39
360	105	69	36	57	48	38	31	17	19
375	278	121	157	138	140	53	68	72	85
390	28	15	13	13	15	8	7	8	5
391	46	33	13	26	20	19	14	6	7
406	213	97	116	111	102	50	47	55	61
407	72	28	44	33	39	15	13	26	18
421	5	2	3	1	4	1	1	3	
422	25	8	17	11	14	4	4	10	7
437	77	39	38	33	44	19	20	24	14
438	89	51	38	44	45	27	24	21	17
453	65	21	44	27	38	14	7	31	13
454	11	1	10	5	6		1	5	5
468	19	10	9	9	10	5	5	5	4
469	38	18	20	16	22	8	10	12	8
484	71	26	45	33	38	16	10	28	17
485	37	14	23	17	20	6	8	12	11
500	10	7	3	5	5	3	4	1	2
515	40	19	21	18	22	10	9	13	8
516	70	40	30	32	38	20	20	18	12
531	15	2	13	6	9		2	7	6
532	4	1	3	2	2	1		2	1
546	7	4	3	3	4	1	3	1	2
547	39	22	17	18	21	11	11	10	7
562	11	4	7	7	4	3	1	3	4
563	17	1	16	6	11		1	10	6
578	13	10	3	6	7	4	6	1	2
579	4	2	2	2	2	1	1	1	1
593	14	3	11	5	9	2	1	8	3
594	35	13	22	19	16	7	6	10	12
610	1	1		1		1			
625	34	13	21	17	17	7	6	11	10
641	3		3	2	1			1	2
656	9	5	4	6	3	2	3		4
657	7	4	3	5	2	4		2	1
671	1		1	1					1
672	10	2	8	3	7	1	1	6	2
687	4	3	1	1	3	1	2	1	
688	2	1	1	2		1			1
703	7	2	5	4	3	1	1	2	3
719	4	1	3	1	3		1	2	1
734	4		4	2	2			2	2
735	3		3	3					3
750	4	2	2	3	1	2		1	1
765	1		1		1			1	
766	1		1		1			1	
781	5	3	2	4	1	3		1	1
782	1		1		1			1	
812	3	1	2		3		1	2	
813	3	1	2	2	1		1		2
843	1	1		1		1			
844	1	1			1		1		
859	3	2	1	2	1	1	1		1
891	1		1	1					1
922	3	1	2	1	2		1	1	1
Total	3977	1991	1986	1992	1985	998	993	992	994

Table 32 shows frequency distribution of simple reaction time - simple response for each subject

	Keyoor	Shweta	Veena	Shruti M	Ruta	Semeena	Minal	Darshini	Rohit	Sumit	Kiran
109											
125											
140											
141											
156											1
157											
171											
172											
187											
188											
203		1									
204				1							
218	1	2									
219	4	17		1		1		1	1		4
234	2	7				2					
235	4	7				2				1	
250	17	37	6	30	4	3		1	1	15	13
265	5	26	2		1	11	3				2
266	8	23			3	17	1	2		6	5
281	11	4	7	14			2	1	1	13	5
282	4	3	3	13	1	1	1	2	3	3	6
296	9	1	2	5	1	12	6	2	1	4	1
297	27	28	21	26	16	37	36	10	18	44	19
312		1		3	1	10	9			2	
313	1	1	2	10	6	12	6		2	2	
328	29	10	35	22	17	26	23	10	38	30	20
329	5	2	8	6	3	1	2	3	8	3	4
343		1			4	4	9	3	3	2	1
344	5	2	4	1	9	15	24	6	6	1	
359	8	2	21	10	1		5	10	16	7	8
360	7		10	4	2	1		6	8	6	6
375	11	7	23	5	18	20	26	12	14	11	8
390		1	1	1	4			2	1		1
391	5		4		2		2	1	2	2	1
406	10	4	9	4	11	4	9	20	25	7	11
407	3	1	2	2	3		1	7	9		7
421						1	4				
422	1	1		1	1	1	9	1	4		
437	2	1	5	3			3	4	5	6	4
438	2		2	2	3		3	6	7	1	6
453	1	1	3		10	2	6	5	8	3	
454	1	1						2			
468	1		1	3	1			1	1	1	1
469			2	2	1			3	2	3	3
484	1		1		3	2	4	7	5	3	5
485				1	4			5		1	7
500			1	2	1	2					
515			2	2	5			9	1		4
516	1		5		8	1		7	5	2	5
531			1			1	1	3			
532					2			1			
546	1		1	2	1			1			
547		1	2	1	5			7	2	3	3
562	1				4				1		1
563			1		1			2			2
578					1						3
579											2
593					3			2			3
594			1		6			4			5
610							1				
625	1				2			5			4
641					2						
656								2			2
657					1						3
671											
672					2			2	1		1
687			1			1					
688								1			
703				1				2			1
719	1				1						
734										2	1
735											1
750					1			1			1
765											
766											1
781					1		1				
782								1			
812					1						1
813								1			
843											
844											
859					2					1	
891											
922								1		1	
	190	193	189	178	180	190	197	185	199	186	193

Table 33 shows frequency distribution of simple reaction time - simple response for each subject

	Aditi	Digvijay	Yogesh	Apurva	Ragam	Sangeeta	Nidhi	Soham	Hamza	Shruti S
109								1		
125				1						
140					1					
141					2					
156										
157								1		
171					1					
172					2				1	
187					2		1			
188					2					
203		1			1					
204										
218	1	2			4			1		
219	6	7			7		1	1	7	
234										
235										
250	15	39	5		24	9	1	5	23	
265	6	6	1	1	3	1		1	5	
266	5	9	1	1	4	3	2	6	13	1
281	11	12	8		20	15	6	11	9	
282	7	1	3		6	2	2	3	5	1
296	2	6	2	1	4	2	1	5	10	3
297	34	27	18	6	28	23	6	26	49	7
312	2		1		3	2		2		
313					1		1	1	1	
328	37	23	26	11	32	25	37	44	28	18
329	5	6	3	2	4	4	4	9	2	2
343			2	2		2	1	2	1	1
344	7	2	10	4	1	6	1	6	2	1
359	13	7	13	13	7	5	11	10	10	14
360	2	2	12	6	6	2	15	3	3	4
375	12	9	19	17	3	11	16	10	8	18
390		1	2	1	2	1	4			6
391		3	1	2	3	2	11	1	1	3
406	6	9	7	16	3	5	13	13	8	19
407	3	1	5	6	1	4	3	3	2	9
421										
422	1			3				2		
437	4	1	3	5	3	8	8	3	2	7
438	2	3	5	6	1	9	15	2	3	11
453	1		4	4		2	3	2	1	9
454	1	1		2	1		1			1
468	1			1		2	1			4
469	1	3		1	1	8	5	2		1
484	4		4	13		5	4			10
485	2	1	3	7		1	1			4
500				2			1		1	
515		1		3		3	5	1		4
516		3	3	9	2	1	4	1	2	11
531				7		1				1
532				1						
546		1								
547	1			3		6	1	1		3
562				2						2
563				4		3		1		3
578			1	2		1	2		1	2
579							1			1
593			2	1		2		1		
594			3	8	1	4		1		2
610										
625	1		3	7		2	2	1	1	5
641						1				
656				3				1		1
657				1			2			
671				1						
672	1	1	1	1						
687							2			
688							1			
703	1		1							1
719			1							1
734										1
735				2						
750										1
765				1						
766										
781			1			1	1			
782										
812			1							
813				1		1				
843			1							
844						1				
859										
891				1						
922				1						
	196	188	176	193	186	186	197	184	199	193

Chart 29 : Frequency distribution of simple reaction time - simple - total

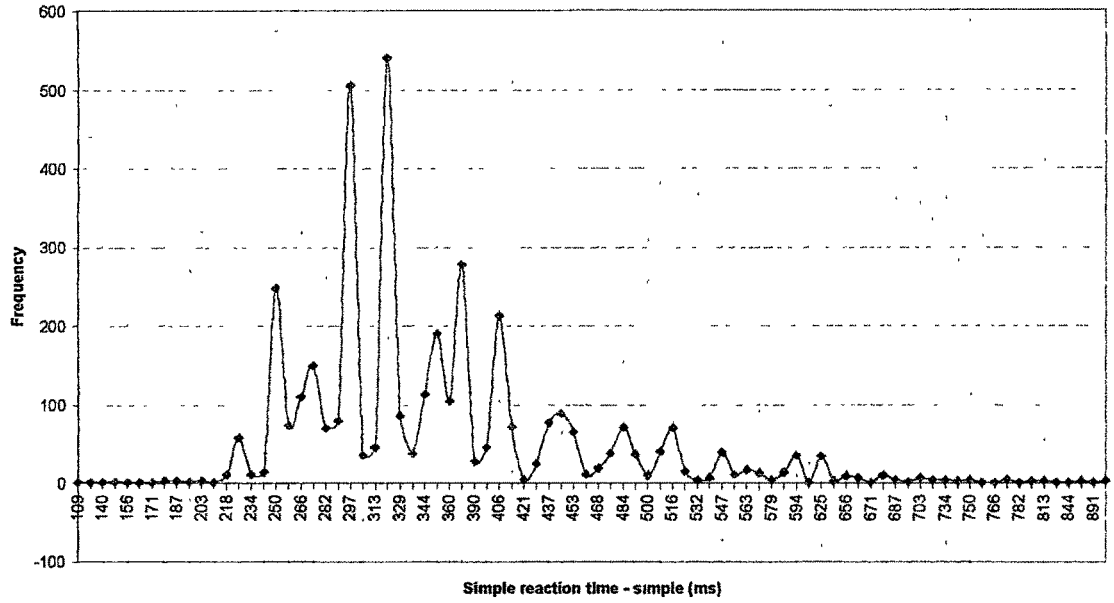


Chart 30 : Frequency distribution of simple reaction time - simple - handwise

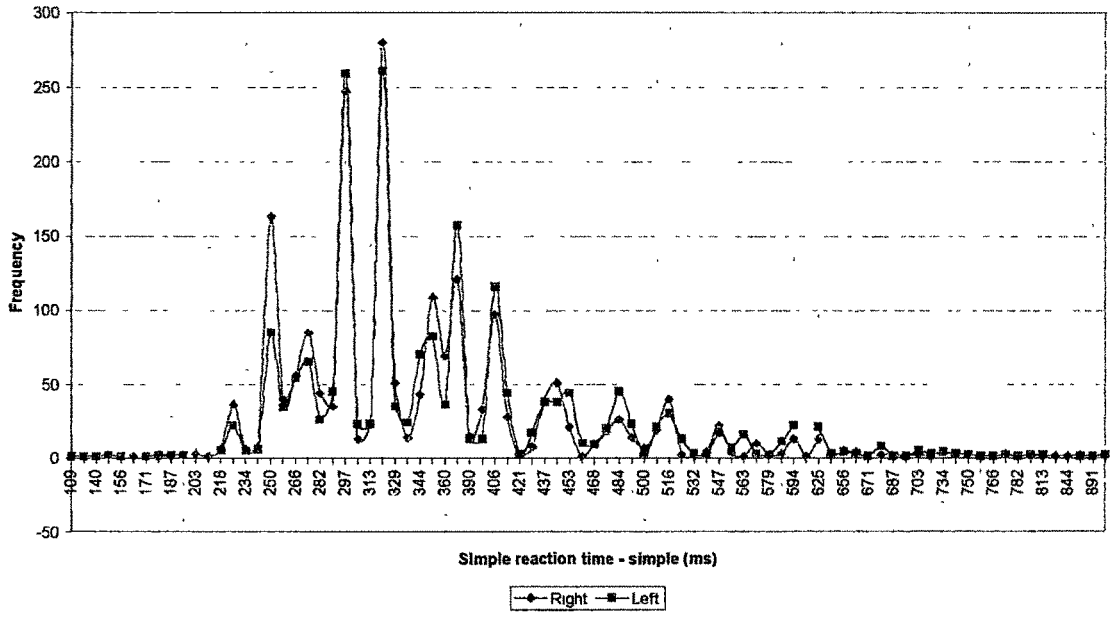


Chart 31 : Frequency distribution of simple reaction time - simple - fingerwise

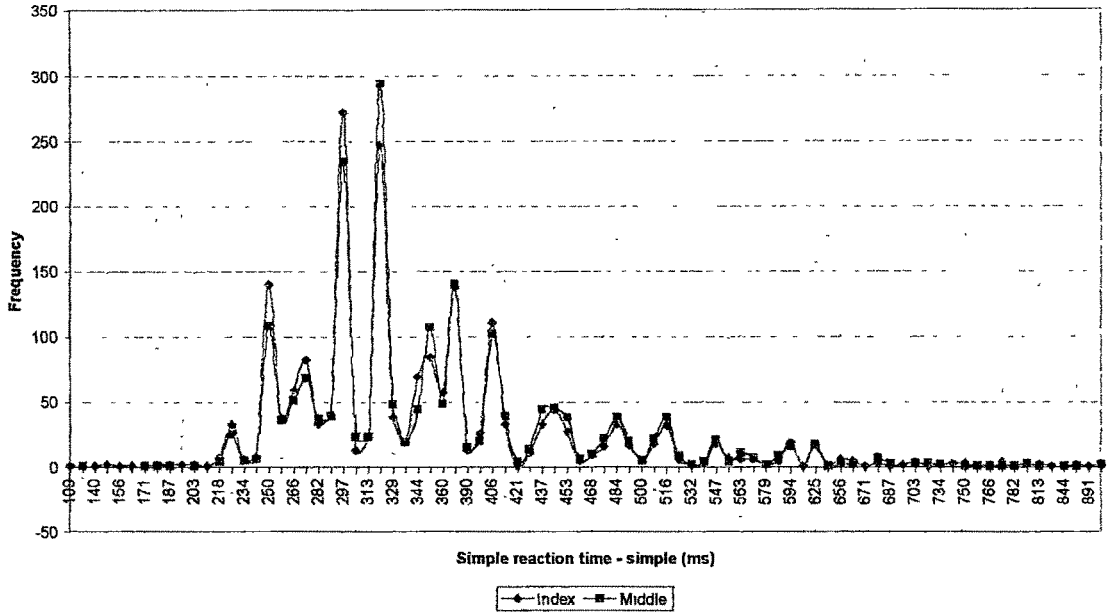


Chart 32 : Frequency distribution of simple reaction time - simple - stimuliwise

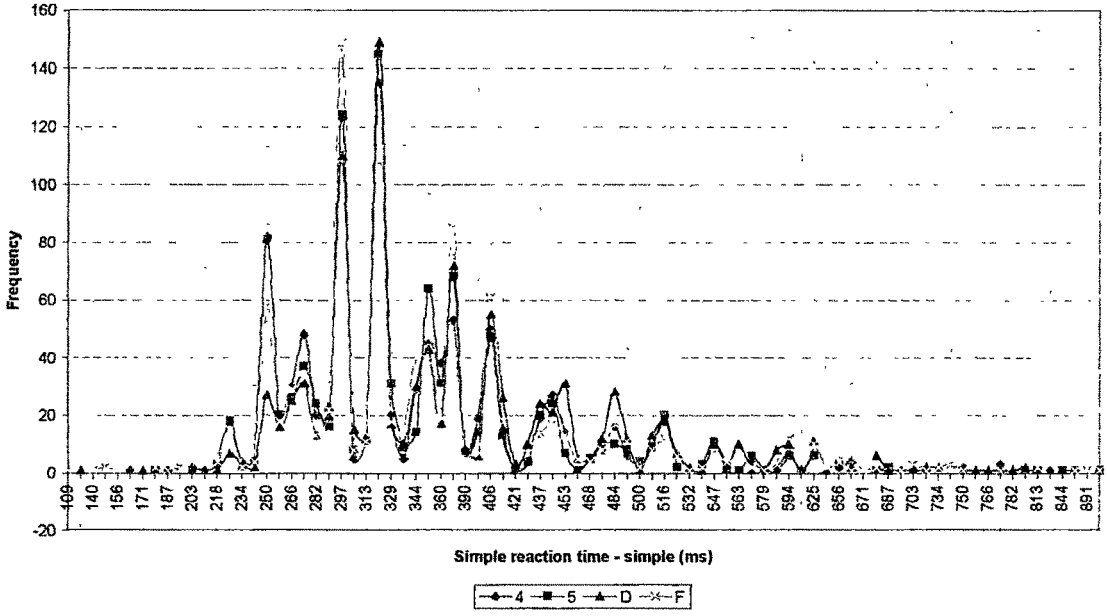


Chart 33 : Frequency distribution of simple reaction time - simple - subjectwise

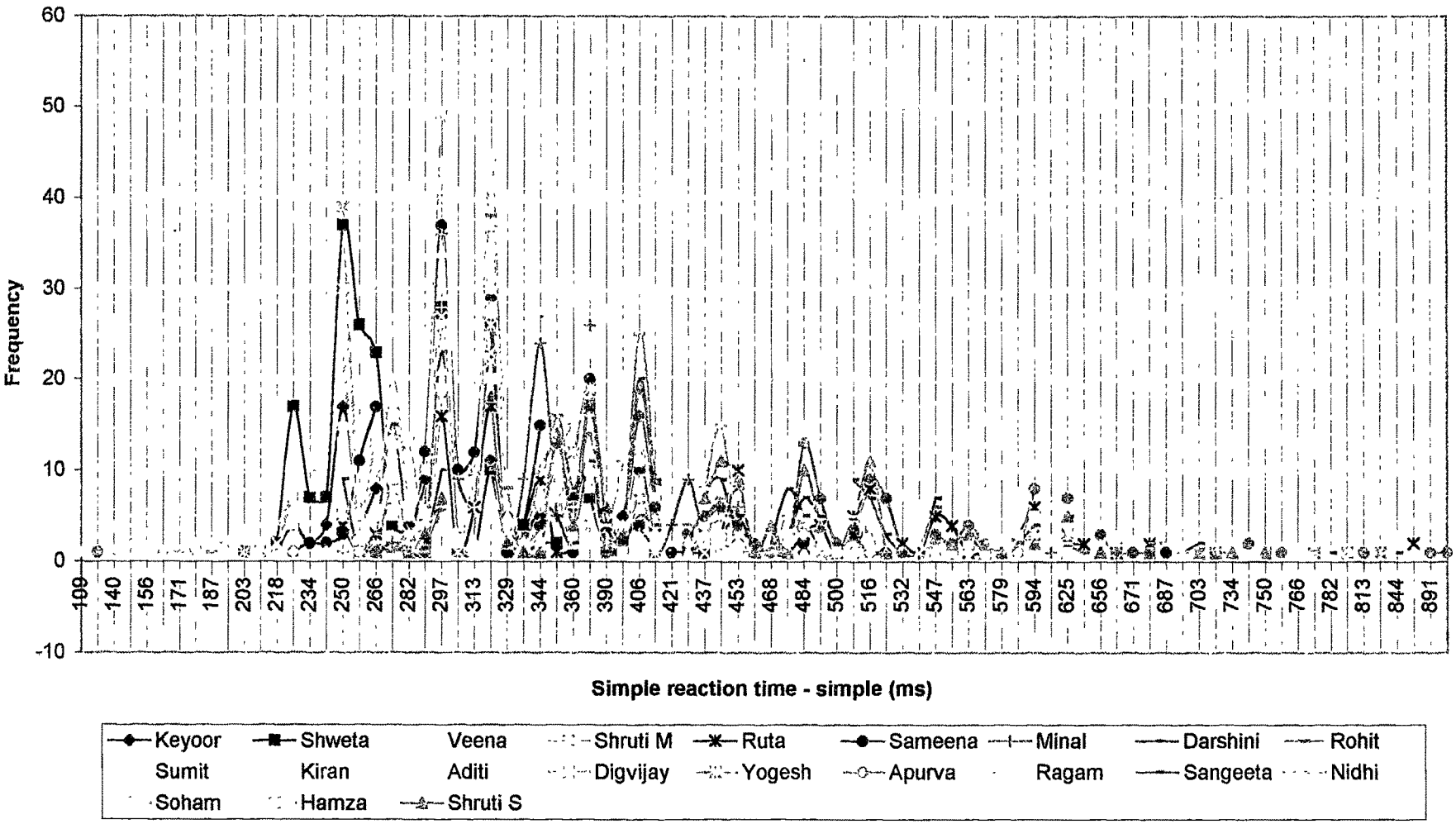


Table 31, Table 32, Table 33 and Chart 29, Chart 30, Chart 31, Chart 32 and Chart 33 shows frequency distribution of simple reaction time - simple response times for total hands, fingers, stimuli and subjects respectively. Each distribution is multimodal. The frequency and pattern differences are indicative of differences in stochastic processes of cognitive and motor processes along with physiological processes implemented in each response.

Conclusion :

Again both finger and hand responses are almost overlapping in modality whereas subjectwise differences are distinctly different. Temporal distribution of responses has stretched from 109 - 922 ms. Out of 814 possible numerical value across the range of 109 - 922 only 84 numerical values have been implemented in instantiation of response. This data provides support for the objective 10 "To understand the trial-to-trial variations in individual performance under different experimental conditions in context of theoretical formulation of EPIC based SRD model of PRP procedures".

Table 34 shows Univariate analysis of variance : Tests of Between-Subjects Effects for Simple Reaction Time - Repeat

Dependent Variable: EXP3D2

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Model	133678111[a]	84	1591406.085	535.046	.000
HAND	159685.245	1	159685.245	53.688	.000
FINGER	1892.330	1	1892.330	.636	.425
FNAME	4679946.295	20	233997.315	78.672	.000
HAND * FINGER	3868.365	1	3868.365	1.301	.254
HAND * FNAME	229473.133	20	11473.657	3.858	.000
FINGER * FNAME	84828.492	20	4241.425	1.426	.098
HAND * FINGER * FNAME	72392.885	20	3619.644	1.217	.229
Error	11579083.9	3893	2974.334		
Total	145257195	3977			

a. R Squared = .920 (Adjusted R Squared = .919)

Table 22 shows results of Between-Subjects effects on dependent variable Simple Reaction Time - Repeat reaction time attained by univariate analysis of variance. Main effects - Hand (right-left), and Fname (subjects) are significant at 0.000 level. Main effect Finger (index-middle) is not significant. Two way interaction between Hand*Fname is significant at 0.000 level. Whereas two way interaction effect between Hand*Finger and Finger*Fname are not significant. Three-way interaction among Hand*Finger*Fname is also not significant. Thus, simple reaction time - Repeat responses are significantly influenced by indepedent variables Hand and Individual differences and their interactions. Finger and its all interactions are not significantly influencing the reaction time.

Table 35 shows mean, SD and V of simple reaction time - Repeat for Total, hands, fingers, stimuli and subjects

	Mean	SD	V
Total	179.72	65.01	0.36
Right	173.53	68.95	0.40
Left	185.93	60.18	0.32
Index	179.03	68.53	0.38
Middle	180.41	61.28	0.34
4	173.86	74.12	0.43
5	173.19	63.35	0.37
D	187.64	58.27	0.31
F	184.22	62.02	0.34
Keyoor	140.89	23.28	0.17
Shweta	193.32	37.06	0.19
Veena	232.99	32.14	0.14
Shruti M.	173.70	41.04	0.24
Ruta	220.23	49.24	0.22
Sameena	177.80	80.18	0.45
Minal	157.94	73.76	0.47
Darshini	266.01	60.22	0.23
Rohit	147.56	31.69	0.21
Sumit	164.53	93.44	0.57
Kiran	182.50	70.67	0.39
Aditi	177.93	56.61	0.32
Digvijay	147.29	68.70	0.47
Yogesh	184.79	50.98	0.28
Apurva	235.59	55.41	0.24
Ragam	184.06	82.26	0.45
Sangeeta	141.76	18.43	0.13
Nidhi	192.59	34.68	0.18
Soham	132.85	19.01	0.14
Hamza	142.40	22.38	0.16
Shruti S.	181.71	66.56	0.37

Table 35 and Chart 34 shows mean, SD and V for total, hands (right-left), fingers (index-middle), stimuli (4-5-D-F) and each subject. Simple reaction time - repeat response of left hand (185.93 ms) is significantly higher than right hand (173.53 ms) as can be seen in Table 35 and supported by Table 34. Right hand response time is less than total reponse time (179.72), whereas left hand response time is more than total reponse time.

Simple reaction time - simple response of index finger (179.03 ms) is not significantly different from middle finger (180.41 ms). Index finger and middle finger response times are almost equal to total response time. Simple reaction time - repeat response of stimuli 5 is lowest (173.19 - right hand middle finger), followed by stimuli 4 (173.86 - right index finger), stimuli F (184.22 - left hand index finger), and stimuli D (187.84 - left hand middle finger). Thus, right hand fingers are significantly faster than left hand fingers.

Individually, Soham is the fastest respondent with mean response time of 132.85 ms, whereas Darshini is the slowest respondent with mean response time of 266.01ms. The difference between this two response time is 133.16 ms.

Highest standard deviation has been observed in case of Sumit (93.44 ms), whereas lowest standard deviation has been observed in case of Sangeeta (18.43 ms). Coefficient of Variation for all independent factors and almost all subject has again become varied.

Chart 34 : Mean & SD of simple reaction time - repeat

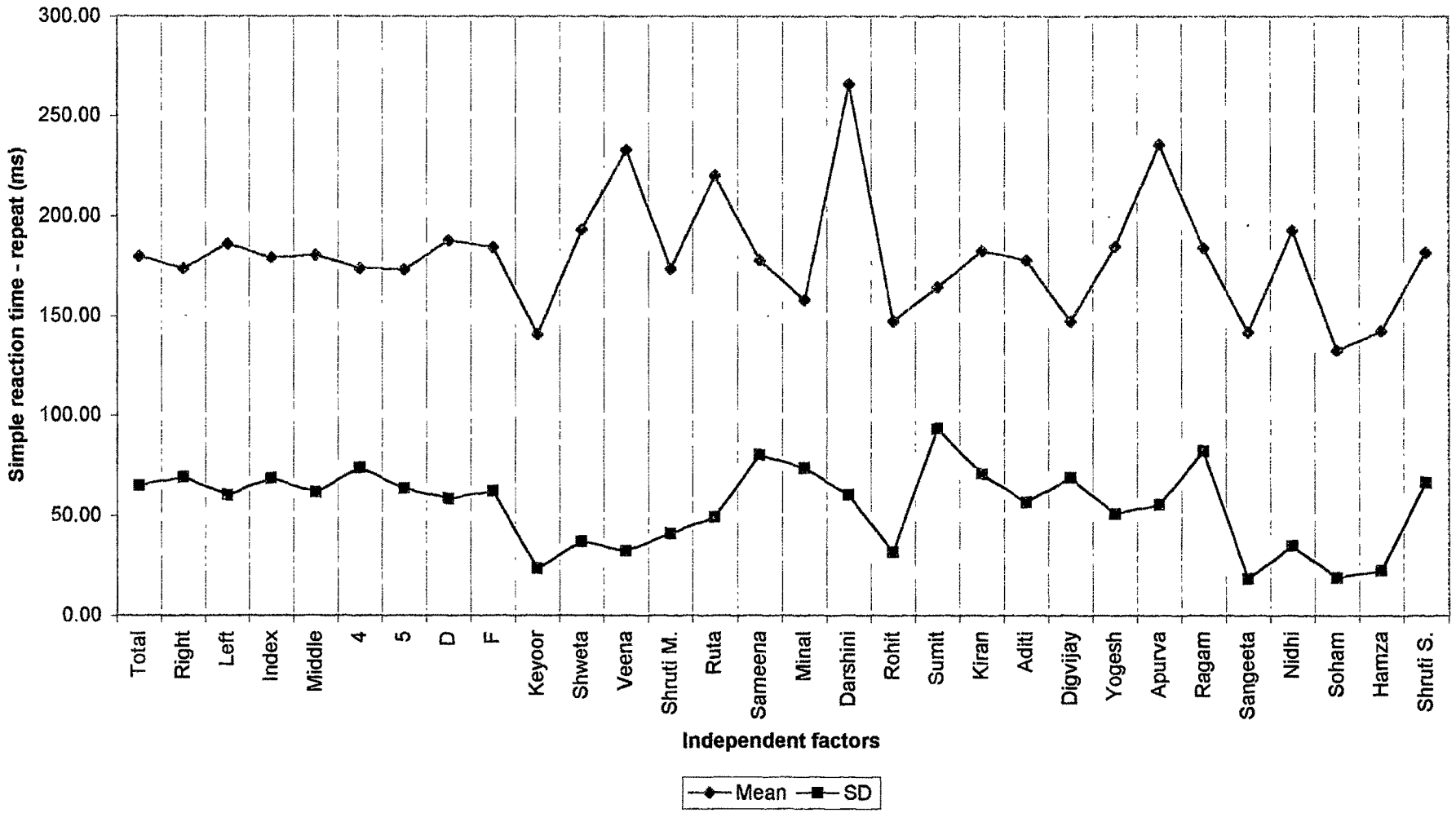


Table 36 shows frequency distribution of simple reaction time - repeat response for Total, hands, fingers, and stimuli

RT	Total	Right	Left	Index	Middle	4	5	D	F
109	207	159	48	113	94	90	69	25	23
110	131	99	32	76	55	59	40	15	17
125	173	104	69	103	70	66	38	32	37
140	228	130	98	114	114	58	72	42	56
141	391	235	156	190	201	107	128	73	83
156	729	385	344	376	353	188	197	156	188
157	243	110	133	117	126	53	57	69	64
171	13	6	7	7	6	3	3	3	4
172	79	45	34	42	37	23	22	15	19
187	476	188	288	224	252	84	104	148	140
188	433	157	276	193	240	69	88	152	124
203	37	9	28	21	16	5	4	12	16
204	8	5	3	5	3	3	2	1	2
218	70	32	38	37	33	18	14	19	19
219	259	107	152	122	137	56	51	86	66
234	80	29	51	47	33	17	12	21	30
235	55	18	37	27	28	8	10	18	19
250	71	32	39	30	41	16	16	25	14
265	39	17	22	18	21	7	10	11	11
266	94	42	52	43	51	23	19	32	20
281	6	3	3	4	2	1	2		3
282	2	1	1	2		1			1
296	4	3	1	2	2	1	2		1
297	45	20	25	24	21	9	11	10	15
312	5	3	2	4	1	2	1		2
328	15	7	8	8	7	5	2	5	3
329	1	1		1		1			
343	3	1	2	1	2	1		2	
344	5	3	2	2	3	1	2	1	1
359	2	1	1		2		1	1	
360	1		1		1			1	
375	6	3	3	5	1	2	1		3
390	1		1		1			1	
391	2	1	1	1	1	1		1	
406	3	2	1	2	1	1	1		1
407	5	2	3	3	2	1	1	1	2
422	2		2		2			2	
438	2	1	1		2		1	1	
453	1	1			1		1		
468	3	2	1	2	1	2		1	
484	6	1	5	1	5		1	4	1
500	2	1	1		2		1	1	
515	3	2	1	2	1	1	1		1
516	4	3	1	2	2	2	1	1	
532	1	1		1		1			
547	4	3	1	3	1	2	1		1
562	3	2	1	3		2			1
563	1		1		1			1	
578	2	1	1		2		1	1	
594	3	2	1	3		2			1
625	3	1	2		3		1	2	
640	1	1			1		1		
641	1		1	1					1
656	3	2	1	2	1	1	1		1
657	1	1			1		1		
672	5	4	1	4	1	3	1		1
703	1		1	1					1
719	1	1		1		1			
734	2	1	1	2		1			1
Total	3977	1991	1986	1992	1985	998	993	992	994

Table 37 shows frequency distribution of simple reaction time - repeat response for each subject

	Keyoor	Shweta	Veena	Shruti M	Ruta	Sameena	Minal	Darshini	Rohit	Sumit	Kiran
109	24			1		4	16		16	24	1
110	24			2		3	13		11	10	
125	18			2		4	9		30	10	1
140	15	7		11		12	19		12	15	11
141	24	7		23	3	23	31		34	29	18
156	54	22		27		52	67		55	48	41
157	14	2		10		18	29		18	28	11
171		2		3	1						2
172	2	12	2	11	1	3			4	3	9
187	7	36	9	44	27	32	5		9	4	50
188	8	40	8	33	29	28	1		5	4	31
203		3	4	1	10	2		1			
204			2	1	2						
218		7	15	2	17			6			2
219		33	60	3	39			27			9
234		11	21		15			9		1	2
235		8	13	1	11			4			
250		1	14		4			41	1		
265			13		4			14			
266			21		9			47	1		
281								3			
282								2			
296			1					3			
297			2	1	3	1		17	1		
312								2		1	
328				1	1			2	2		
329											
343						1					
344			1								
359			1					1			
360											1
375			1								
390											
391											
406		1						1			
407			1			1	1			1	
422					1	1					
438											
453					1						
468		1									
484					1	1	1			1	
500										1	1
515							1	1			
516							2	1			
532										1	
547							1			1	1
562						1		1			
563					1						
578				1							
594										1	
625								1		1	
640										1	
641						1					
656											
657						1					
672						1	1	1		1	
703											1
719											
734											1
	190	193	189	178	180	190	197	185	199	186	193

Table 38 shows frequency distribution of simple reaction time - repeat response for each subject

	Aditi	Digvijay	Yogesh	Apurva	Ragam	Sangeeta	Nidhi	Soham	Hamza	Shruti S
109	1	35			1	23		33	25	3
110	1	19	1		1	6		22	15	3
125		22	4		2	21		35	15	
140	20	18	8		12	17	3	16	19	13
141	16	24	12	2	22	36	8	28	32	19
156	43	36	34	3	48	61	7	30	70	31
157	12	18	9		12	16	4	18	13	11
171	1		1				1			2
172	4		5	2	5	2	7	1	2	4
187	41	3	43	25	33	4	62	1	3	38
188	41	7	27	26	34		62		3	46
203	2		2	3	1		7			1
204			1							2
218	2		3	12			4			
219	3	1	15	41	1		17		1	9
234			2	9	1		6			3
235	3		2	4	1		5			3
250				8	1					1
265				8						
266				13	1		1		1	
281				2	1					
282										
296										
297		1	1	18						
312				2						
328	1		1	6			1			
329				1						
343				2						
344				2	1		1			
359										
360										
375	1			2	1					1
390					1					
391			2							
406			1							
407					1					
422										
438					2					
453										
468			2							
484		1		1						
500										
515							1			
516	1									
532										
547				1						
562		1								
563										
578	1									
594	1	1								
625										1
640										
641										
656		1			1					1
657										
672										1
703										
719					1					
734					1					
	195	188	176	193	186	186	197	184	199	193

Chart 35 : Frequency distribution of simple reaction time - repeat - total

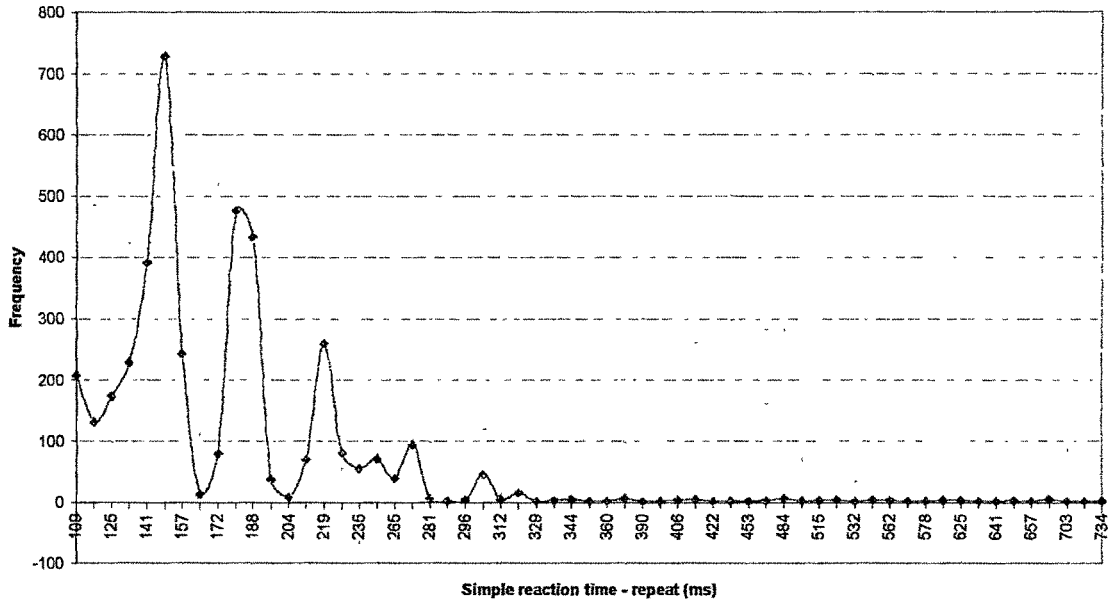


Chart 36 : Frequency distribution of simple reaction time - repeat - handwise

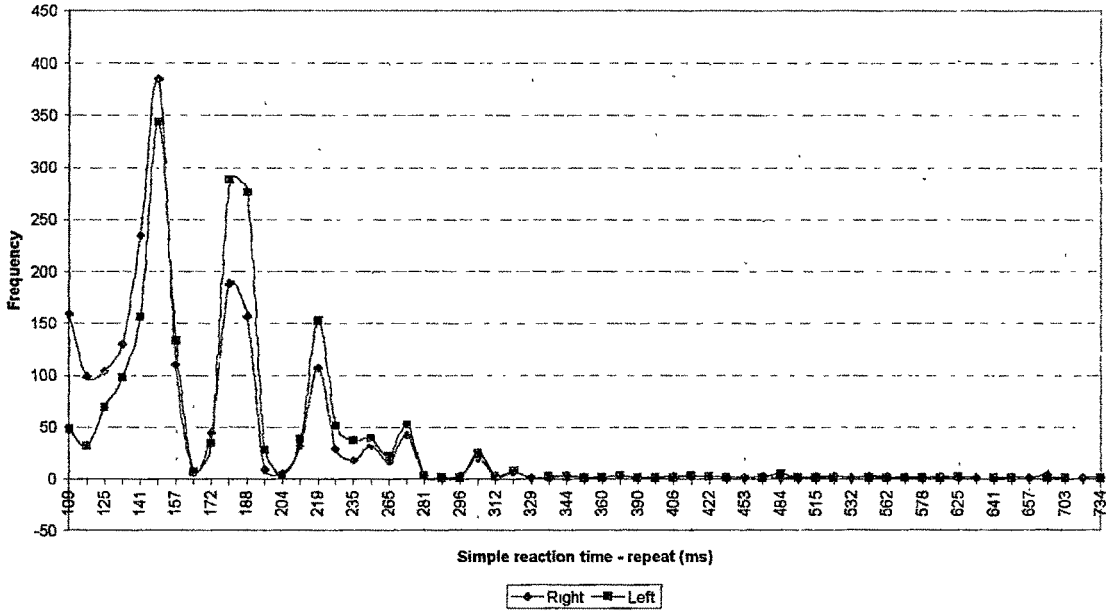


Chart 37 : Frequency distribution of simple reaction time - repeat - fingerwise

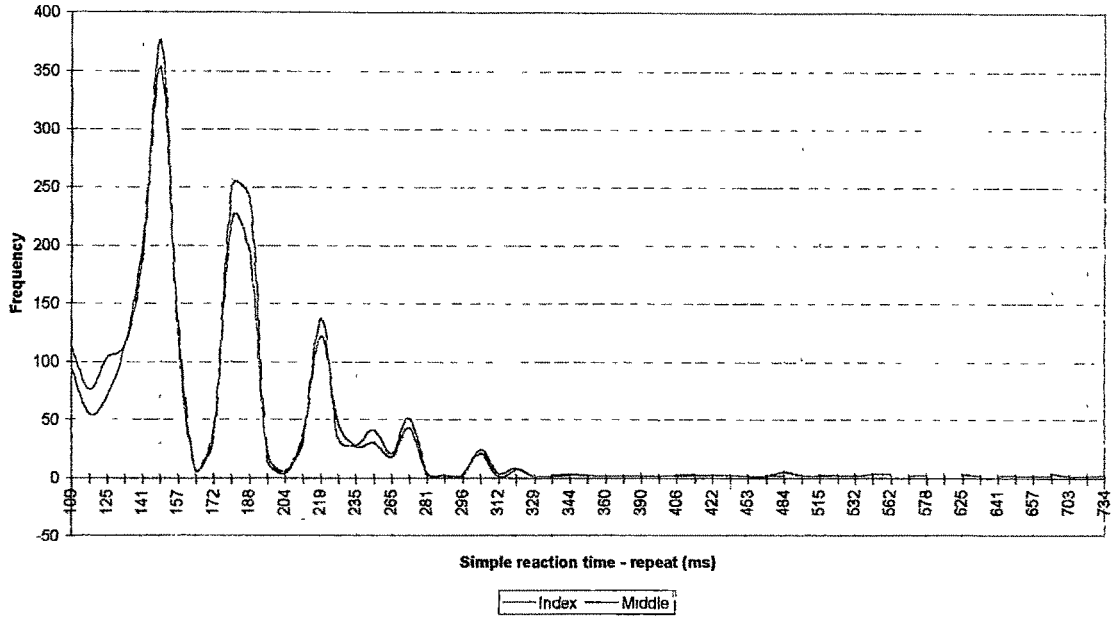


Chart 38 : Frequency distribution of simple reaction time - repeat - stimuliwise

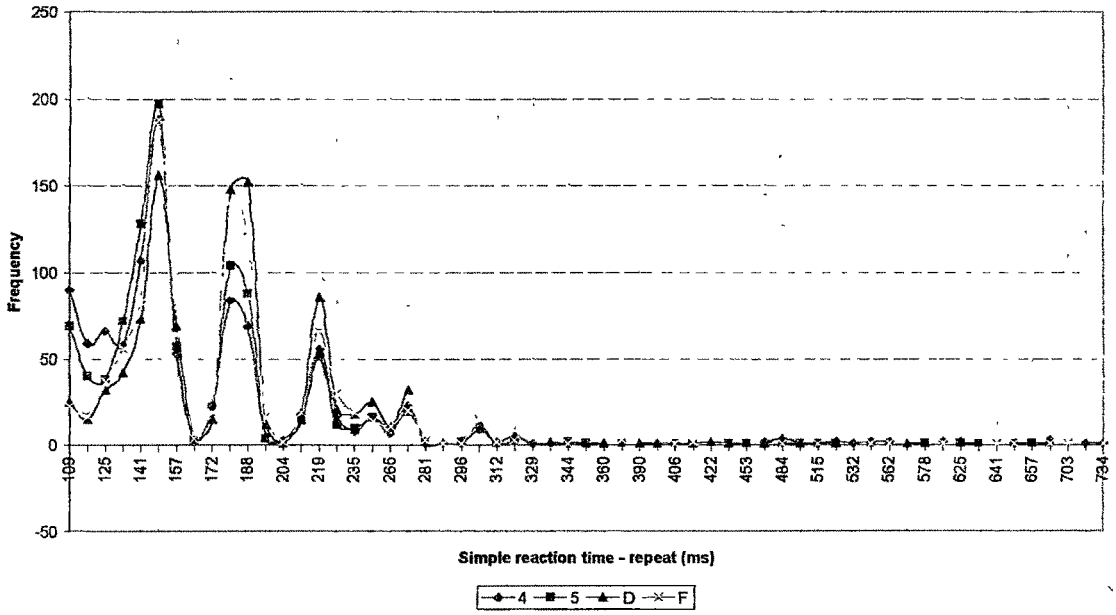


Chart 39 : Frequency distribution of simple reaction time - repeat - subjectwise

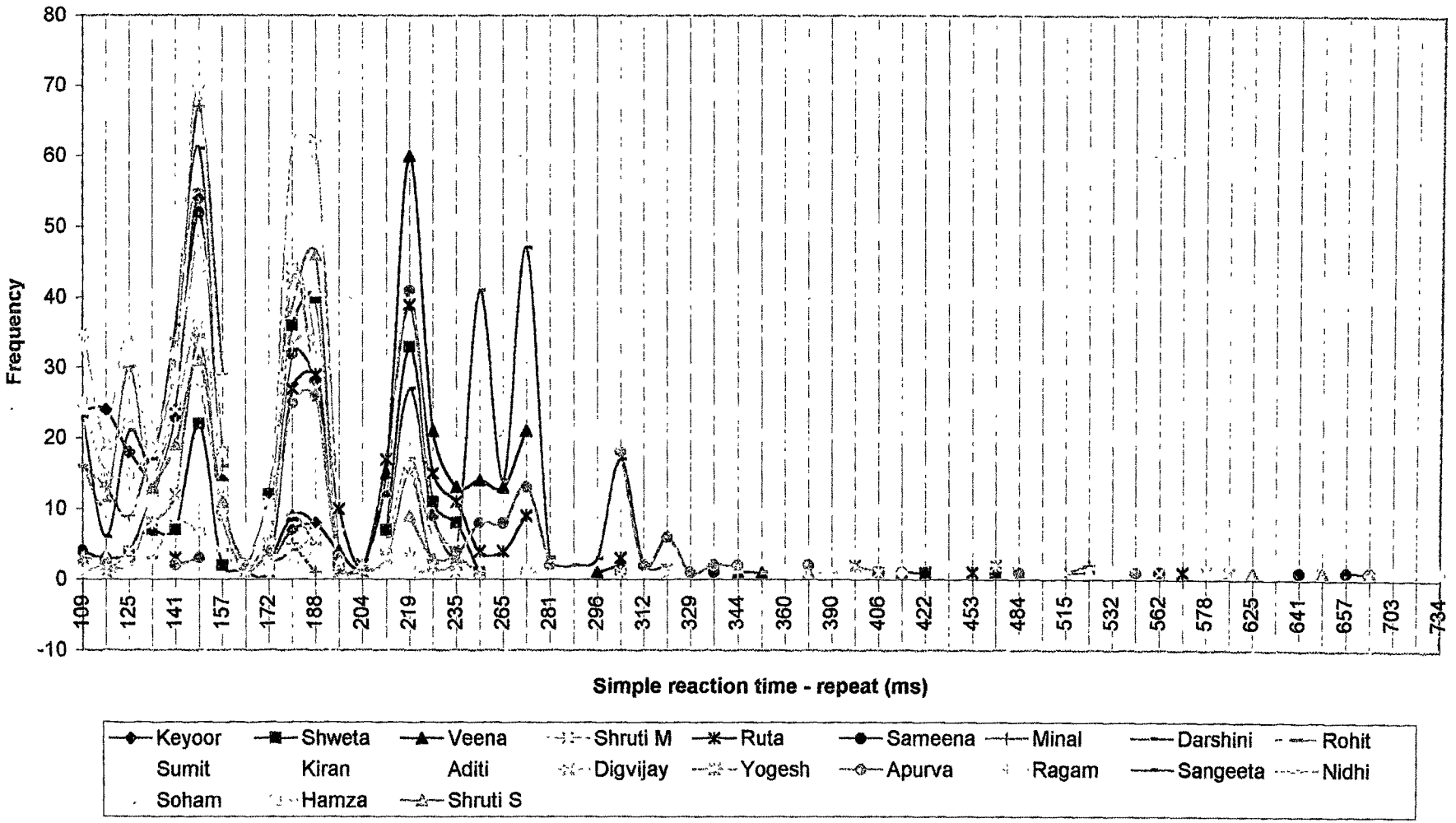


Table 36, Table 37, Table 38 and Chart 35, Chart 36, Chart 37, Chart 38 and Chart 39 shows frequency distribution of simple reaction time - repeat response times for total hands, fingers, stimuli and subjects respectively. Each distribution is multimodal. The frequency and pattern differences are indicative of differences in stochastic processes of cognitive and motor processes along with physiological processes implemented in each response.

Conclusion :

In this experiment, hand responses are showing differences similar to Experiment 2 - Repetitive response in its pattern. Whereas finger responses are almost overlapping in modality. Subjectwise differences are distinctly large, again similar to Experiment 2 - Repetitive response in its pattern. One interesting feature is the extended tail on right side of the chart. Beyond 344 ms up to 734 ms there are actually very few responses. Temporal distribution of responses has stretched from 109 - 734 ms, which is much larger than that of Experiment 2 : Repetitive response (78 - 328 ms). Out of 626 possible numerical value across the range of 109 - 734 only 59 numerical values have been implemented in instantiation of response. This data provides support for the objective 10 "To understand the trial-to-trial variations in individual performance under different experimental conditions in context of theoretical formulation of EPIC based SRD model of PRP procedures".

Table 39 shows paired sample t tests between Experiment 2 : Repetitive response time and Experiment 3 : Simpire reaction time - repeat response time for Total, and stimuli

Factor	Pair	Descriptive statistics				Paired statistics				
		Mean	N	SD	SEM	Mean	SD	SEM	t	df	Sig. (2-tailed)
Total	EXP2	179.07	3903	38.02	0.61	0.21	66.04	1.06	0.20	3902	0.84
	EXP3D2	178.86	3903	65.02	1.04						
4	EXP2	166.24	988	33.05	1.05	-7.33	73.61	2.34	-3.13	987	0.00
	EXP3D2	173.56	988	74.30	2.36						
5	EXP2	164.88	981	32.21	1.03	-7.46	64.76	2.07	-3.61	980	0.00
	EXP3D2	172.34	981	63.07	2.01						
D	EXP2	197.61	950	39.30	1.28	12.01	60.52	1.96	6.11	949	0.00
	EXP3D2	185.61	950	58.16	1.89						
F	EXP2	188.19	984	36.53	1.16	4.05	62.37	1.99	2.04	983	0.04
	EXP3D2	184.14	984	62.19	1.98						

Table 39, and Chart 40 shows details of paired sample t test done between Experiment 2 : Repetitive response time and Experiment 3 : Simple reaction time - repeat response time for toal and stimuli factors. Paired differences on total are not significant, whereas paired differences on stimuli are significant. Stimulus 4 and Stimulus 5 response times of Experiment 2 : Repetitive responses are significantly less than stimulus 4 and stimulus 5 response times of Experiment 3 : Simple reaction time - repeat responses. Whereas stimulus D and stimulus F response times of Experiment 2 : Repetitive responses are significantly more than stimulus D and stimulus F response times of Experiment 3 : Simple reaction time - repeat responses. Thus, repeat response time magnitude is influenced by preceding cognitive task in comparison to repetitive response times without preceding cognitive task.

Conclusion :

Above analysis does not support hypothesis 4 "Second response time of Experiment 3 shall be same as the repetitive response time of the respective stimuli." It also helps understand the trial-to-trial variations in individual performance under different experimental conditions in context of theoretical formulation of EPIC based SRD model of PRP procedures" is related to this experiment. Chart 41 presents comparative distribution of Experiment 2 : Repetitive response times and Experiment 3 : Simple reaction time - repeat response times.

Chart 40 : Paired sample mean differences between repetitive response & simple reaction time - repeat

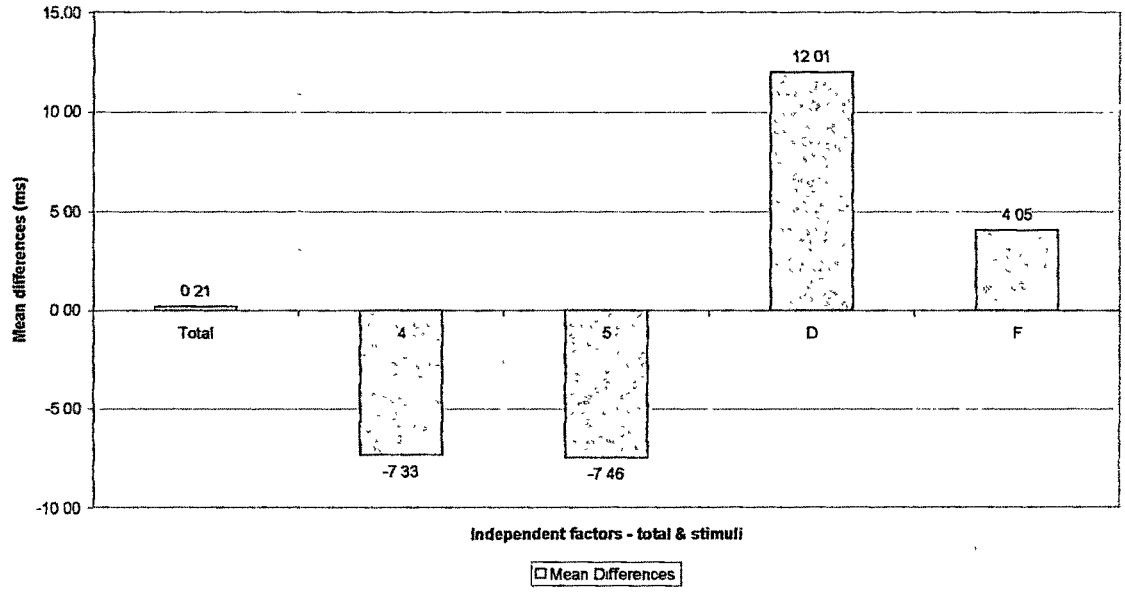
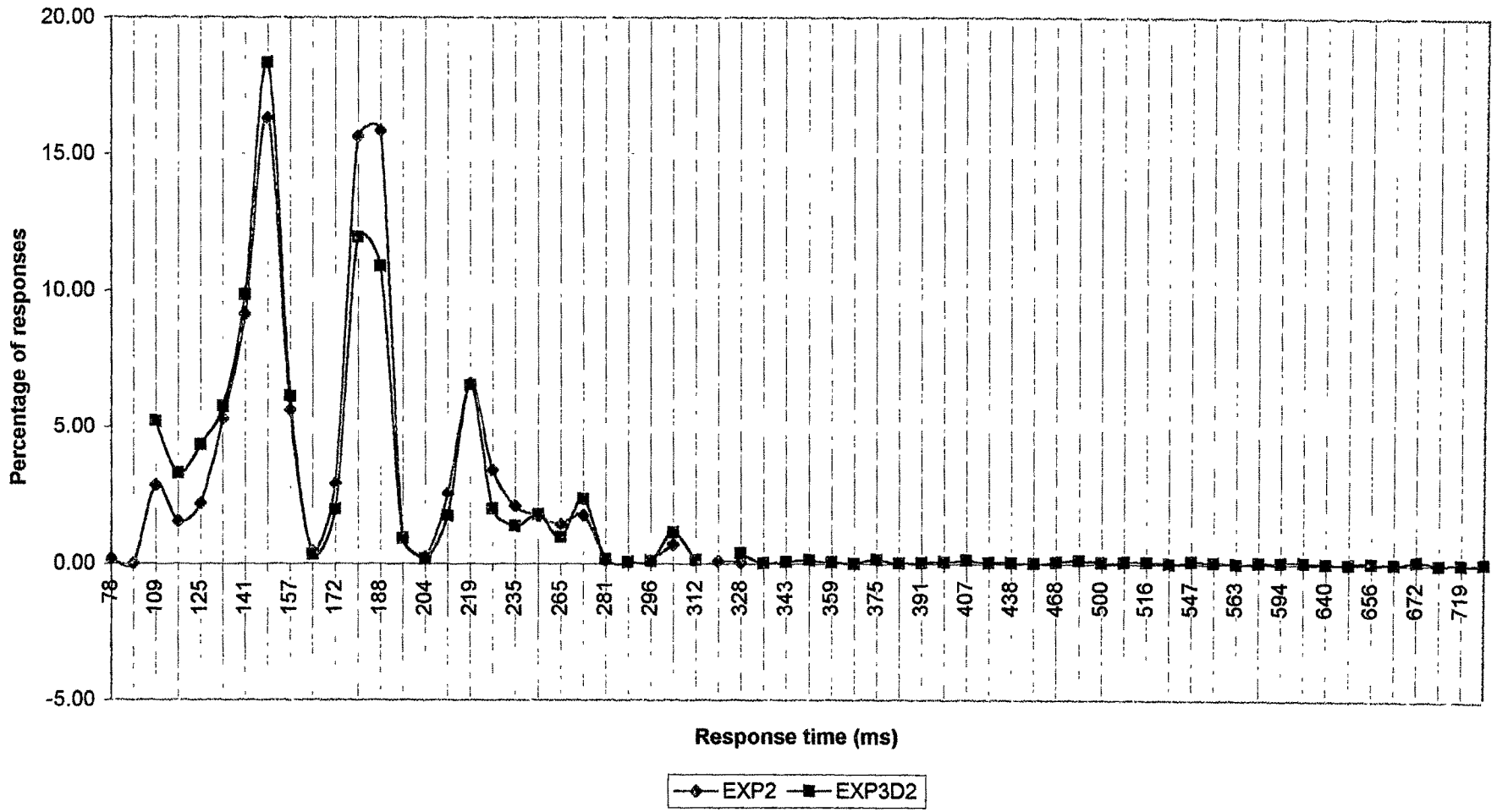


Chart 41 : Comparative frequency distribution of repetitive response time & simple reaction time - repeat



Experiment 4

Discrete Successive Choice Reaction Time - Serial

This experiment was done to understand the variation in reaction time as a result of choice reaction situation. It was done in two parts. First part included choice reaction time based on two choices, namely either letter stimuli (4 or 5 with right hand) or digital stimuli (d or f with left hand) in random order. Second part included choice reaction time based on four choices, namely both letter stimuli and digital stimuli together in random order. Therefore data has been analysed for both separately. Reaction times of first part of experiment have been termed as Short Serial and reaction times of second part of experiment have been termed as Long Serial. Findings of this experiment are relevant for understanding the effect of stimulus numerosity on reaction times.

Hypothesis related to this experiment is hypothesis 6 "Choice reaction times - serial shall be higher than simple reaction time in case of letter stimuli in comparision to digit stimuli." The objecitve 10 "To understand the trial-to-trial variations in individual performance under different experimental conditions in context of theoretical formulation of EPIC based SRD model of PRP procedures" is related to this experiment.

Table 40 shows Univariate analysis of variance : Tests of Between-Subjects Effects for Discrete Successive Choice Reaction Time - Short Serial

Dependent Variable: EXP4SRS

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Model	738353684[a]	84	8789924.811	988.578	.000
HAND	1353165.411	1	1353165.411	152.187	.000
FINGER	177358.628	1	177358.628	19.947	.000
FNAME	6389537.187	20	319476.859	35.931	.000
HAND * FINGER	71493.377	1	71493.377	8.041	.005
HAND * FNAME	862906.220	20	43145.311	4.852	.000
FINGER * FNAME	434630.135	20	21731.507	2.444	.000
HAND * FINGER * FNAME	315372.524	20	15768.626	1.773	.018
Error	33769842.9	3798	8891.480		
Total	772123527	3882			

a. R Squared = .956 (Adjusted R Squared = .955)

Table 40 shows results of Between-Subjects effects on dependent variable Discrete Choice Reaction Time - Short Serial reaction time attained by univariate analysis of variance. Main effects - Hand (right-left), Finger (index-middle) and Fname (subjects) are significant at 0.000 level. Two way interaction between Hand*Finger, Hand*Fname, and Finger*Fname are significant at 0.005, 0.000 and 0.000 level respectively. Three-way interaction among Hand*Finger*Fname is also significant at 0.018 level. Thus, Discrete Choice Reaction Time - Short Serial responses are significantly influenced by indepedent variables Hand, Finger and Individual differences and their interactions.

Table 41 shows mean, SD and V of Discrete Successive Choice Reaction Time - Short Serial responses for Total, hands, fingers, stimuli and subjects

Total	433.25	105.80	0.24
Right	414.42	97.47	0.24
Left	452.45	110.44	0.24
Index	426.19	100.82	0.24
Middle	440.34	110.15	0.25
4	411.70	92.03	0.22
5	417.14	102.58	0.25
D	464.15	112.60	0.24
F	440.87	107.06	0.24
Keyoor	422.05	86.12	0.20
Shweta	396.46	100.34	0.25
Veena	420.72	77.65	0.18
Shruti M.	436.55	106.59	0.24
Ruta	452.02	115.93	0.26
Sameena	406.81	81.57	0.20
Minal	418.36	85.34	0.20
Darshini	506.40	103.77	0.20
Rohit	410.52	75.43	0.18
Sumit	413.58	72.24	0.17
Kiran	420.14	105.57	0.25
Aditi	424.97	99.60	0.23
Digvijay	403.80	107.09	0.27
Yogesh	480.32	123.60	0.26
Apurva	537.52	125.88	0.23
Ragam	386.51	100.02	0.26
Sangeeta	494.80	123.61	0.25
Nidhi	440.60	72.59	0.16
Soham	427.96	114.51	0.27
Hamza	364.10	54.01	0.15
Shruti S.	422.81	85.69	0.20

Chart 42 : Mean & SD of discrete successive choice reaction time - short serial

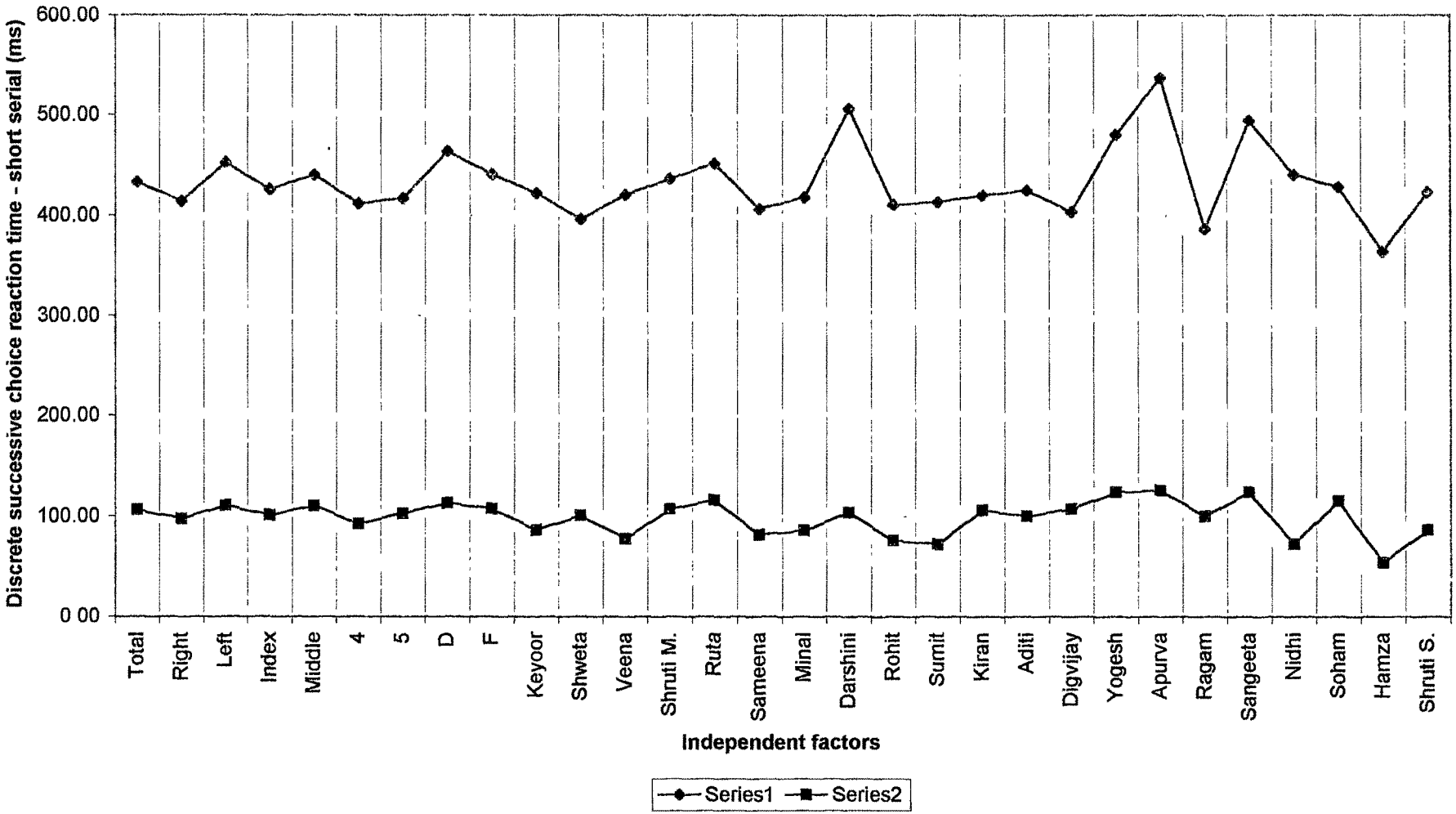


Table 41 and Chart 42 shows mean, SD and V for total, hands (right-left), fingers (index-middle), stimuli (4-5-D-F) and each subject. Discrete Successive Choice Reaction Time - Short Serial response of left hand (452.45 ms) is significantly higher than right hand (414.42 ms) as can be seen in Table 41 and supported by Table 40. Right hand response time is less than total reponse time (433.25 ms), whereas left hand response time is more than total reponse time.

Simple reaction time - simple response of index finger (426.19 ms) is significantly different from middle finger (440.34 ms). Index finger response time is less than total response time, whereas middle finger response time is more than total response time. Discrete Successive Choice Reaction Time - Short Serial response of stimuli 4 is lowest (411.70 ms - right hand index finger), followed by stimuli 5 (417.14 ms - right hand middle finger), stimuli F (440.87 ms - left hand index finger), and stimuli D (464.15 ms - left hand middle finger). Thus, right hand fingers are significantly faster than left hand fingers.

Individually, Hamza is the fastest respondent with mean response time of 364.10 ms, whereas Apurva is the slowest respondent with mean response time of 537.52 ms. The difference between this two response time is 173.42 ms.

Highest standard deviation has been observed in case of Apurva (125.88 ms), whereas lowest standard deviation has been observed in case of Hamza (54.01 ms). Coefficient of Variation has varied from typical 0.2 for all independent factors and almost all subjects.

Table 42 shows frequency distribution of Discrete successive choice reaction time - short serial response times for total, hands, fingers and stimuli. Chart 43 shows graphical presentation of frequency distribution of Discrete successive choice reaction time - short serial response times for total. The distribution is multimodal.

Table 42 shows frequency distribution of Discrete Successive Choice Reaction Time - Short Serial responses for Total, hands, fingers, and stimuli

	Total	Right	Left	Index	Middle	4	5	D	F
172	1	1			1		1		
187	1	1		1		1			
188	1	1		1		1			
203	3	1	2	2	1		1		2
218	5	4	1	4	1	3	1		1
219	10	10		4	6	4	6		
234	1	1		1		1			
235	2	1	1	1	1		1		1
250	50	35	15	21	29	13	22	7	8
265	20	13	7	10	10	4	9	1	6
266	26	15	11	15	11	6	9	2	9
281	35	22	13	18	17	10	12	5	8
282	9	9		3	6	3	6		
296	18	11	7	10	8	6	5	3	4
297	144	92	52	99	45	60	32	13	39
312	9	6	3	4	5	3	3	2	1
313	17	10	7	6	11	3	7	4	3
328	308	183	125	164	144	95	88	56	69
329	33	24	9	18	15	13	11	4	5
343	15	5	10	9	6	3	2	4	6
344	66	28	38	39	27	18	10	17	21
359	179	112	67	84	95	50	62	33	34
360	99	58	41	57	42	34	24	18	23
375	278	147	131	134	144	62	85	59	72
390	51	36	15	29	22	18	18	4	11
391	91	61	30	49	42	34	27	15	15
406	374	197	177	187	187	108	89	98	79
407	129	71	58	63	66	30	41	25	33
421	10	4	6	4	6	2	2	4	2
422	42	22	20	23	19	13	9	10	10
437	201	105	96	99	102	47	58	44	52
438	181	104	77	98	83	54	50	33	44
453	157	50	107	80	77	32	18	59	48
454	17	5	12	6	11	2	3	8	4
468	47	29	18	22	25	14	15	10	8
469	108	52	56	49	59	25	27	32	24
484	147	54	93	70	77	25	29	48	45
485	100	36	64	51	49	21	15	34	30
500	37	22	15	19	18	13	9	9	6
515	105	44	61	47	58	21	23	35	26
516	154	65	89	70	84	24	41	43	46
531	48	7	41	22	26	5	2	24	17
532	6	2	4	3	3	1	1	2	2
546	19	7	12	12	7	6	1	6	6
547	111	57	54	59	52	34	23	29	25
562	39	13	26	16	23	5	8	15	11
563	37	11	26	13	24	3	8	16	10
578	38	17	21	15	23	8	9	14	7
579	2	2		1	1	1	1		
593	19	5	14	12	7	3	2	5	9
594	70	21	49	32	38	7	14	24	25
609	6	1	5	3	3		1	2	3
610	6	2	4	2	4		2	2	2
625	55	19	36	28	27	9	10	17	19
640	6	1	5	1	5		1	4	1
641	9	2	7	1	8		2	6	1
656	10	7	3	6	4	4	3	1	2
657	8	4	4	4	4	2	2	2	2
671	3	2	1		3		2	1	
672	28	5	23	13	15	3	2	13	10
687	3	1	2	1	2		1	1	1
688	1		1		1			1	
703	15	5	10	9	6	3	2	4	6
704	3	1	2		3		1	2	
718	2		2	1	1			1	1
719	4	3	1	2	2	1	2		1
734	5	4	1	2	3	2	2	1	
735	5	1	4	2	3		1	2	2
750	4	3	1	3	1	3		1	
765	2	1	1	1	1	1		1	
766	3		3		3			3	
781	1	1		1		1			
782	2		2		2			2	
812	1		1	1					1
813	4	1	3		4		1	3	
828	2	1	1		2		1	1	
829	1		1	1					1
843	1		1		1			1	
844	1		1	1					1
859	2	1	1	1	1	1		1	
890	2	1	1		2		1	1	
907	1		1	1					1
921	1		1		1			1	
922	1		1	1					1
937	2		2		2			2	
953	2	1	1		2		1	1	
1000	3	2	1	1	2		2		1
1047	3	1	2		3		1	2	
1093	1		1		1			1	
1109	2		2	1	1			1	1
1125	1		1	1					1
Total	3882	1960	1922	1945	1937	979	981	956	966

Chart 43 : Frequency distribution of discrete successive choice reaction time - short serial - total

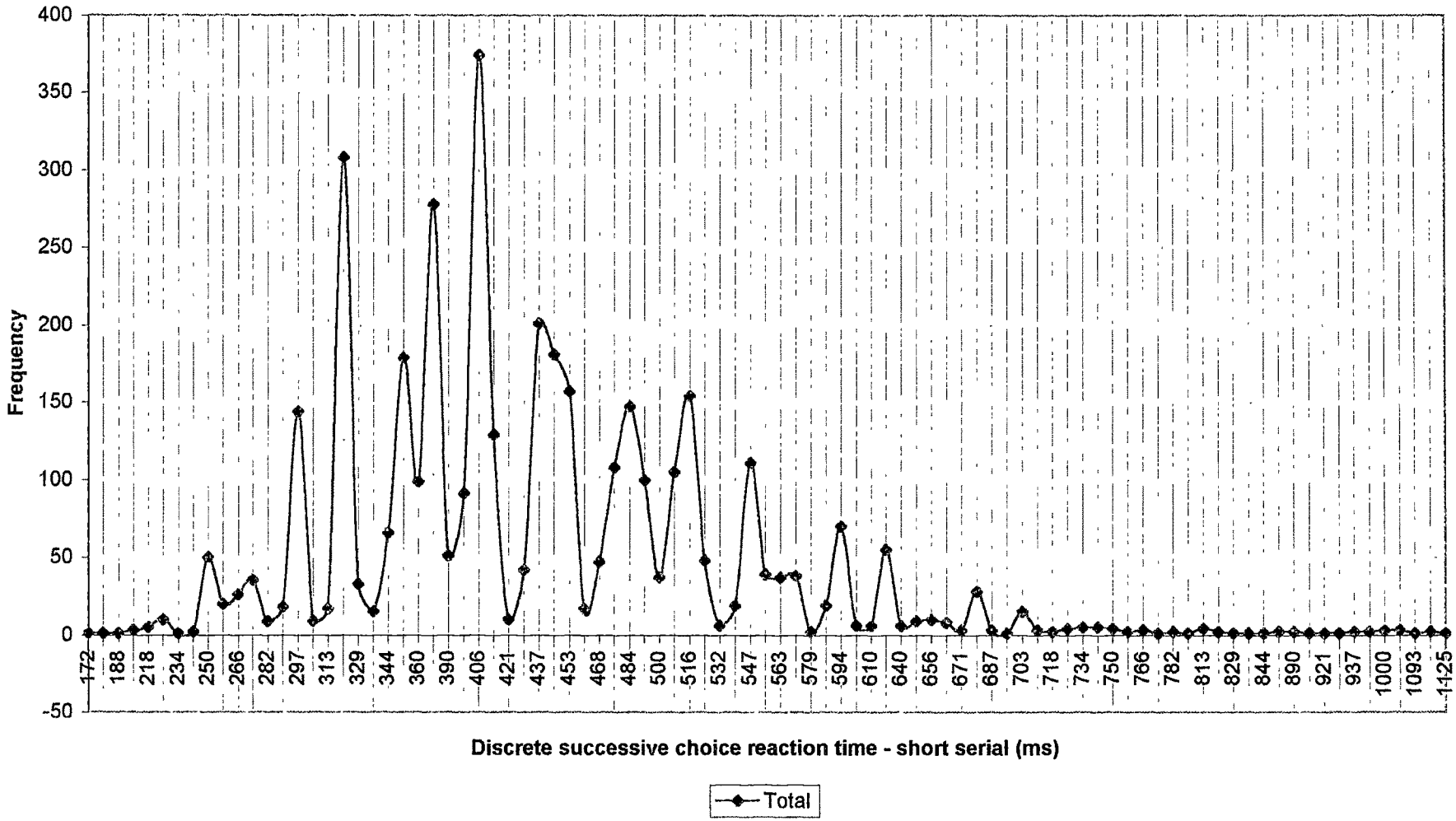


Table 43 shows Univariate analysis of variance : Tests of Between-Subjects Effects for Discrete Successive Choice Reaction Time - Long Serial

Dependent Variable: EXP4SRL

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Model	1273979396[a]	84	15166421.38	923.774	.000
HAND	1280618.966	1	1280618.966	78.001	.000
FINGER	278390.995	1	278390.995	16.957	.000
FNAME	13380910.0	20	669045.498	40.751	.000
HAND * FINGER	662390.987	1	662390.987	40.346	.000
HAND * FNAME	2059267.075	20	102963.354	6.271	.000
FINGER * FNAME	633248.114	20	31662.406	1.929	.008
HAND * FINGER * FNAME	575535.728	20	28776.786	1.753	.020
Error	60696920.7	3697	16417.885		
Total	1334676317	3781			

a. R Squared = .955 (Adjusted R Squared = .953)

Table 24 shows results of Between-Subjects effects on dependent variable Discrete Choice Reaction Time - Long Serial reaction time attained by univariate analysis of variance. Main effects - Hand (right-left), Finger (index-middle) and Fname (subjects) are significant at 0.000 level. Two way interaction between Hand*Finger, Hand*Fname, and Finger*Fname are significant at 0.000, 0.000 and 0.008 level respectively. Three-way interaction among Hand*Finger*Fname is also significant at 0.020 level. Thus, Discrete Choice Reaction Time -Long Serial responses are significantly influenced by indepedent variables Hand, Finger and Individual differences and their interactions.

Table 44 shows mean, SD and V of Discrete Successive Choice Reaction Time - Long Serial responses for Total, hands, fingers, stimuli and subjects

	Mean	SD	V
Total	576.23	144.77	0.25
Right	557.75	144.57	0.26
Left	594.70	142.63	0.24
Index	568.53	140.04	0.25
Middle	584.09	149.06	0.26
4	563.05	144.00	0.26
5	552.23	145.04	0.26
D	615.20	146.41	0.24
F	574.14	135.72	0.24
Keyoor	526.94	97.56	0.19
Shweta	585.18	150.51	0.26
Veena	575.89	123.50	0.21
Shruti M.	561.83	142.22	0.25
Ruta	624.01	153.76	0.25
Sameena	542.60	127.58	0.24
Minal	564.92	95.74	0.17
Darshini	675.66	142.55	0.21
Rohit	541.27	113.34	0.21
Sumit	548.45	129.20	0.24
Kiran	540.08	138.68	0.26
Aditi	556.89	131.93	0.24
Digvijay	554.19	129.26	0.23
Yogesh	620.97	144.79	0.23
Apurva	741.07	169.07	0.23
Ragam	504.23	108.03	0.21
Sangeeta	652.02	154.79	0.24
Nidhi	594.61	124.51	0.21
Soham	540.49	132.19	0.24
Hamza	469.02	102.40	0.22
Shruti S.	594.38	151.28	0.25

Chart 44 : Mean & SD of discrete successive choice reaction time - long serial

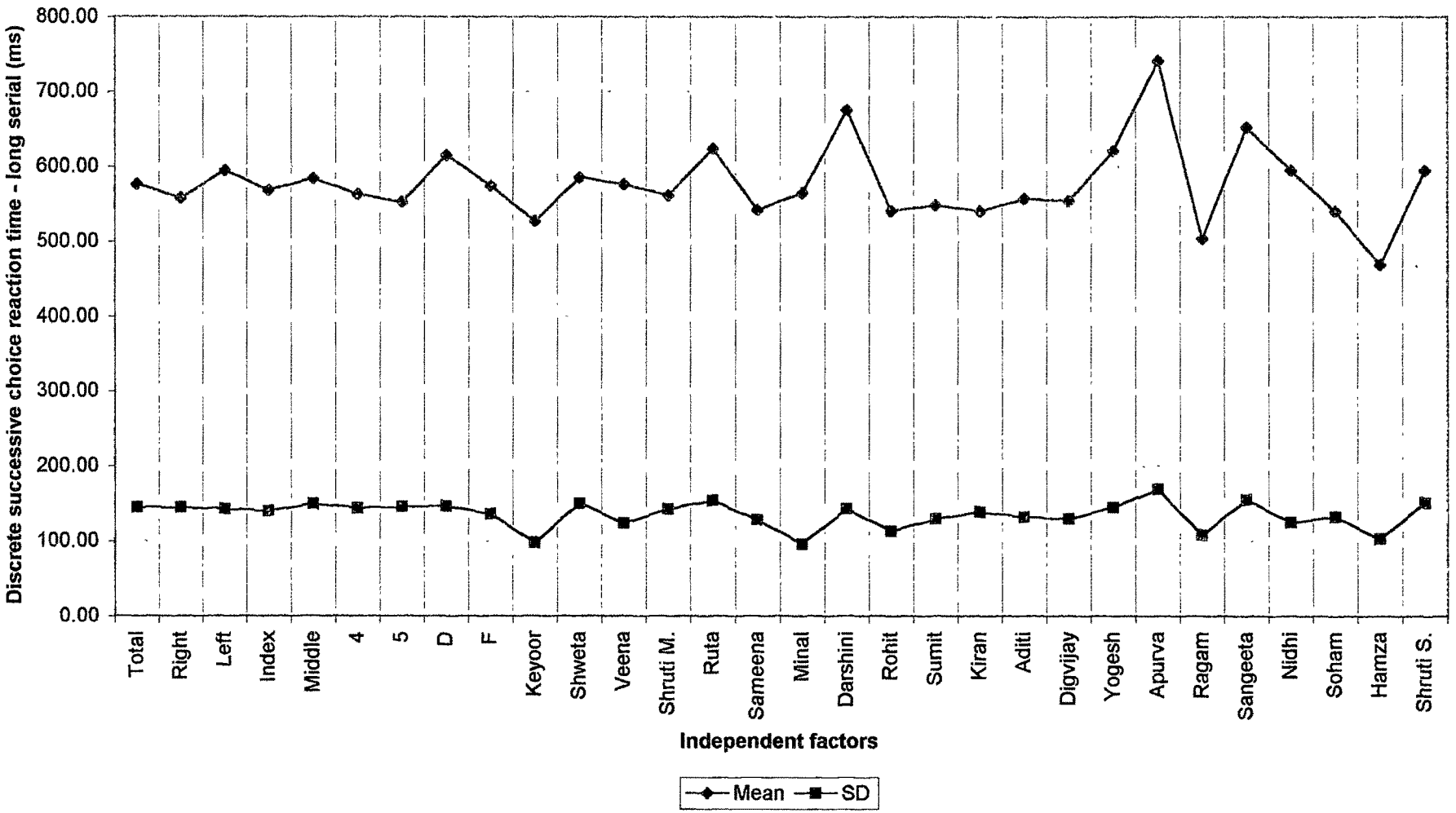


Table 44 and Chart 44 shows mean, SD and V for total, hands (right-left), fingers (index-middle), stimuli (4-5-D-F) and each subject. Discrete successive choice reaction time - long serial response of left hand (594.70 ms) is significantly higher than right hand (557.75 ms) as can be seen in Table 44 and supported by Table 43. Right hand response time is less than total reponse time (576.23 ms), whereas left hand response time is more than total reponse time.

Discrete successive choice reaction time - long serial response of index finger (568.53 ms) is significantly different from middle finger (584.09 ms). Discrete successive choice reaction time - long serial response of stimuli 5 is lowest (552.23 ms - right hand middle finger), followed by stimuli 4 (563.06 ms - right index finger), stimuli F (574.14 ms - left hand index finger), and stimuli D (615.20 ms - left hand middle finger). Thus, right hand fingers are significantly faster than left hand fingers.

Individually, Hamza is the fastest respondent with mean response time of 469.02 ms, whereas Apurva is the slowest respondent with mean response time of 741.07 ms. The difference between this two response time is 272.05 ms.

Highest standard deviation has been observed in case of Apurva (169.07 ms), whereas lowest standard deviation has been observed in case of Minal (95.74 ms). Coefficient of Variation for all independent factors and almost all subject has become 0.2 except for Minal and stimulus D.

Table 45 shows frequency distribution of Discrete successive choice reaction time - short serial response times for total, hands, fingers and stimuli. Chart 45 shows graphical presentation of frequency distribution of Discrete successive choice reaction time - long serial response times for total. The distribution is multimodal.

Table 45 shows frequency distribution of Discrete Successive Choice Reaction Time - Long Serial responses for Total, hands, fingers, and stimuli

RT	Total	Right	Left	Index	Middle	4	5	D	F
218	1		1	1					1
250	2		2	1	1			1	1
266	3	2	1	3		2			1
281	7	3	4	4	3	1	2	1	3
296	3	3		1	2	1	2		
297	9	6	3	5	4	3	3	1	2
312	1		1	1					1
313	2	2		1	1	1	1		
328	48	40	8	28	20	22	18	2	6
329	8	6	2	3	5	2	4	1	1
343	2	1	1	1	1		1		1
344	9	6	3	3	6	2	4	2	1
359	47	32	15	27	20	17	15	5	10
360	30	21	9	12	18	8	13	5	4
375	77	48	29	42	35	27	21	14	15
390	21	11	10	9	12	2	9	3	7
391	26	19	7	9	17	4	15	2	5
406	107	67	40	53	54	29	38	16	24
407	45	21	24	25	20	11	10	10	14
421	2	1	1	2		1			1
422	6	5	1	1	5		5		1
437	103	62	41	62	41	33	29	12	29
438	118	67	51	64	54	37	30	24	27
453	52	27	25	30	22	14	13	9	16
454	6	6		4	2	4	2		
468	31	14	17	18	13	7	7	6	11
469	116	69	47	58	58	29	40	18	29
484	129	68	61	73	56	32	36	20	41
485	90	57	33	49	41	23	34	7	26
500	65	40	25	34	31	25	15	16	9
515	127	66	61	66	61	34	32	29	32
516	233	115	118	119	114	60	55	59	59
531	36	15	21	15	21	6	9	12	9
532	9	4	5	3	6	1	3	3	2
546	40	23	17	19	21	10	13	8	9
547	274	147	127	136	138	74	73	65	62
562	70	30	40	42	28	17	13	15	25
563	79	37	42	37	42	21	16	26	16
578	137	61	76	68	69	31	30	39	37
579	16	9	7	9	7	6	3	4	3
593	66	26	40	31	35	14	12	23	17
594	219	106	113	116	103	59	47	56	57
609	19	11	8	14	5	9	2	3	5
610	8	3	5	3	5	2	1	4	1
625	269	112	157	139	130	65	47	83	74
640	26	9	17	15	11	6	3	8	9
641	33	17	16	16	17	10	7	10	6
656	97	39	58	42	55	15	24	31	27
657	24	13	11	12	12	7	6	6	5
671	15	5	10	7	8	2	3	5	5
672	103	43	60	46	57	22	21	36	24
687	20	6	14	9	11	3	3	8	6
688	15	3	12	4	11	1	2	9	3
703	133	51	82	68	65	27	24	41	41
704	21	6	15	11	10	3	3	7	8
718	3	3		2	1	2	1		
719	10	4	6	6	4	4		4	2
734	75	32	43	34	41	18	14	27	16
735	34	15	19	19	15	8	7	8	11
750	30	11	19	15	15	7	4	11	8
765	13	5	8	6	7	4	1	6	2
766	29	12	17	16	13	6	6	7	10
781	46	11	35	22	24	7	4	20	15
782	10	1	9	5	5		1	4	5
797	8	4	4	3	5	2	2	3	1
812	24	11	13	13	11	7	4	7	6
813	21	11	10	4	17	2	9	8	2
828	5	2	3	2	3	1	1	2	1
829	1	1		1		1			
843	6	4	2	4	2	2	2		2
844	20	11	9	7	13	5	6	7	2
859	13	3	10	5	8		3	5	5
860	9	5	4	2	7	1	4	3	1
875	12	7	5	4	8	4	3	5	
890	13	9	4	4	9	4	5	4	
891	19	12	7	8	11	7	5	6	1
906	2	1	1	2		1			1
907	1	1		1		1			
921	3		3	1	2			2	1
922	19	8	11	5	14	3	5	9	2
937	4	2	2	2	2	2		2	
938	6	3	3	4	2	2	1	1	2
953	8	4	4	4	4	2	2	2	2
954	1		1	1					1
969	11	6	5	6	5	4	2	3	2
984	4	2	2	2	2	1	1	1	1
985	2	2		1	1	1	1		
1000	9	4	5	5	4	3	1	3	2
1015	1	1			1		1		
1016	1		1		1			1	
1031	8	5	3	4	4	4	1	3	
1032	4	1	3	3	1	1		1	2
1047	3	1	2		3		1	2	
1062	2	2			2		2		
1063	1	1		1		1			
1078	10	2	8	5	5	1	1	4	4
1093	2	1	1		2		1	1	
1109	4	1	3		4		1	3	
1110	1	1		1		1			
1125	2		2		2			2	
1140	1	1		1		1			
1141	6	3	3	3	3	2	1	2	1
1156	8	2	6	3	5		2	3	3
1157	1		1	1					1
Total	3781	1890	1891	1909	1872	965	925	947	944

Chart 45 : Frequency distribution of discrete successive choice reaction time - long serial - total

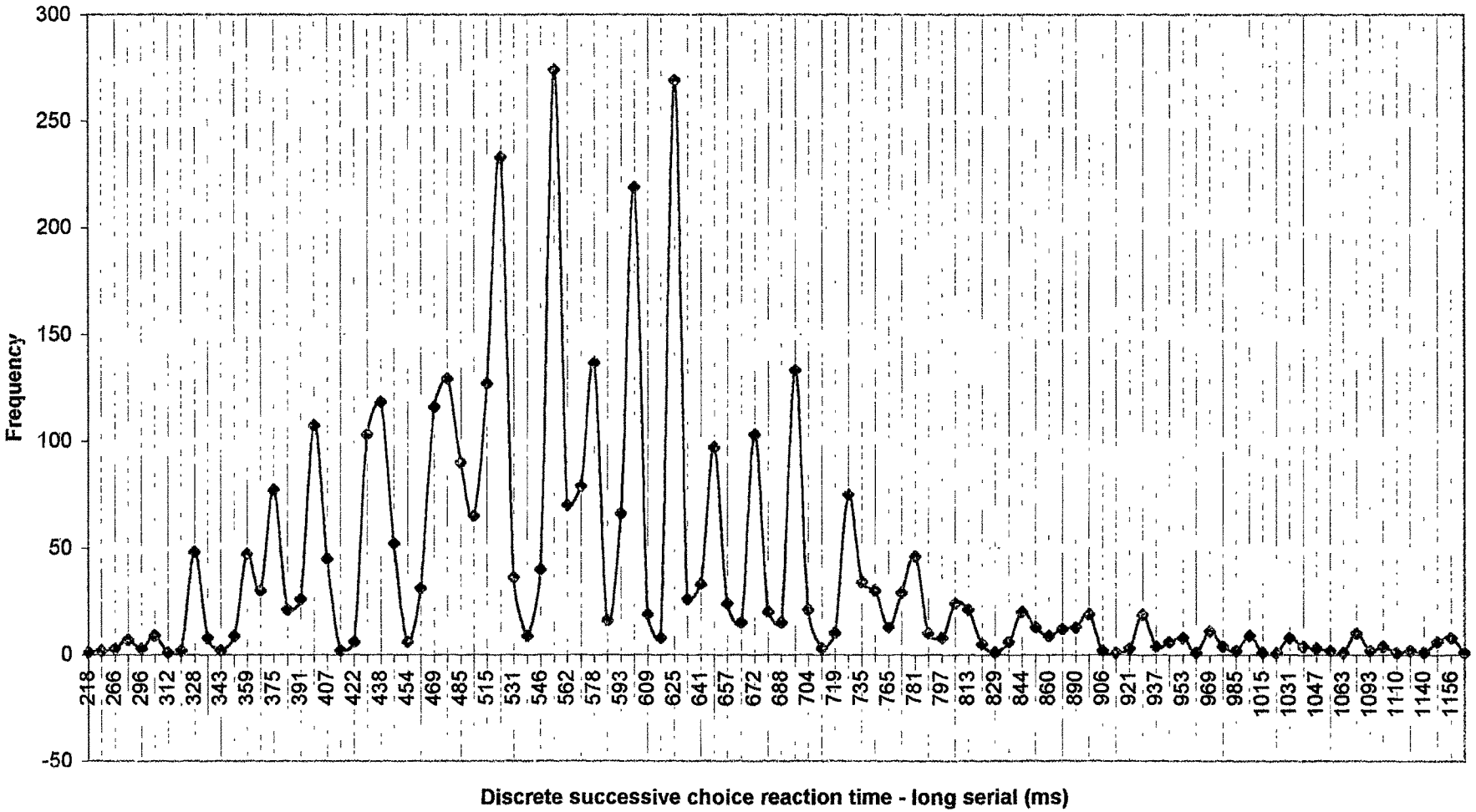


Table 46 shows mean differences between Discrete Successive Choice Reaction Time - Short Serial responses and Experiment 3 : Simple Reaction Time - Single Responses

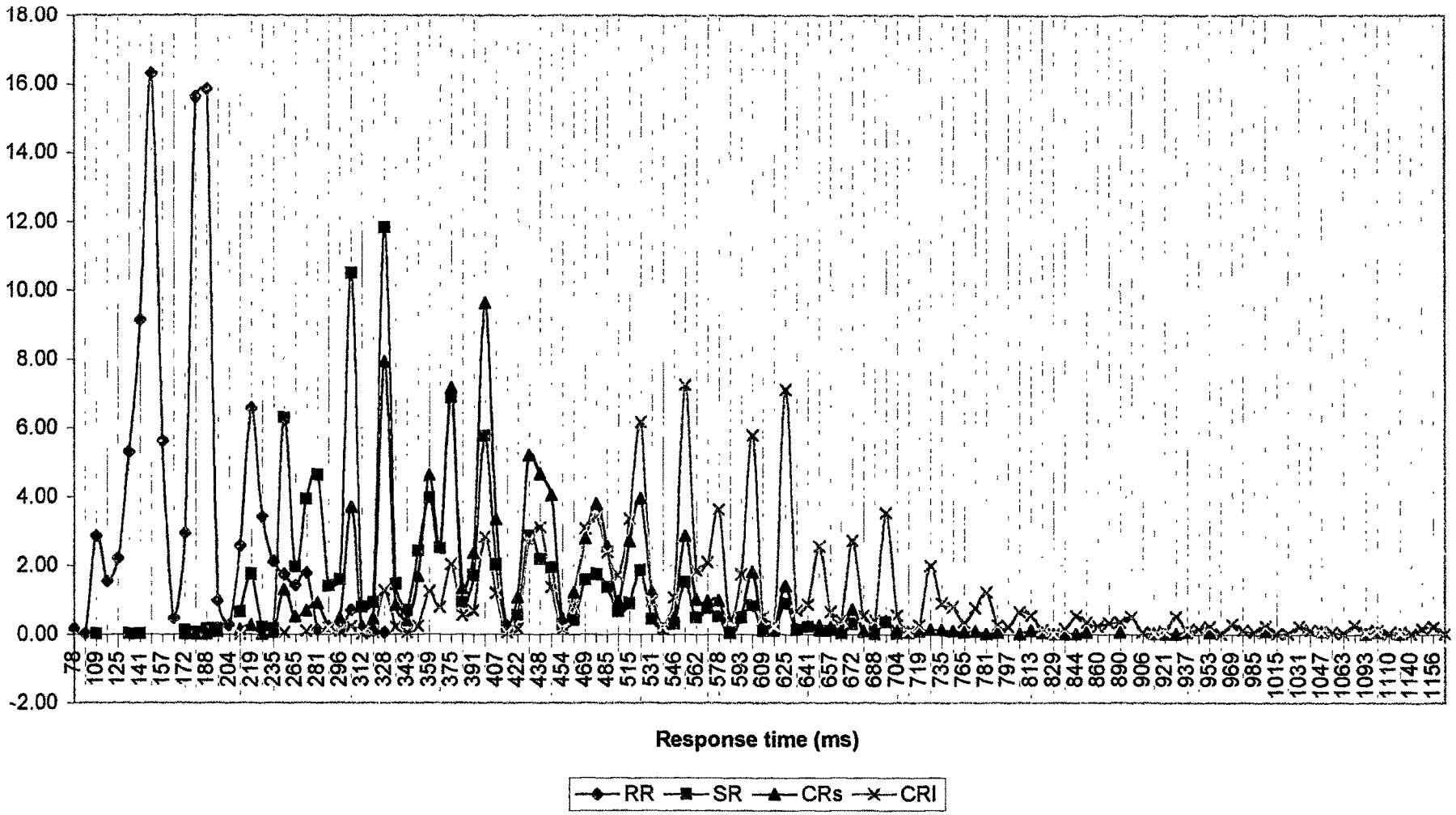
Expt 3 Mean	Expt 3 Mean	Expt 4 Mean	Mean difference
4	369.55	411.70	42.15
5	353.88	417.14	63.26
D	374.34	464.15	89.81
F	367.86	440.87	73.02
Total	366.35	433.25	66.90

Table 46 shows mean differences between Experiment 4 : Discrete Successive Choice Reaction Time - Short Serial responses and Experiment 3 : Simple Reaction Time - Single Responses stimuliwise. All the differences are more than 42 ms.

Conclusion :

Above table clearly indicates significant mean differences and hence doing paired sample t test is a clutter. Thus, hypothesis 6 "Choice reaction times - serial shall be higher than simple reaction time in case of letter stimuli in comparision to digit stimuli." is supported. The objecitve of trial-to-trial variations in individual performance under different experimental conditions in context of theoretical formulation of EPIC based SRD model of PRP procedures" could be observed by looking at the Chart 46 which displays combined frequency distribution for Repetitive response time, Simple reaction time, Discrete successive choice reaction time for both short and long serial. This chart clearly indicates temporal overlaps and distinct temporal duration specific to the task.

Chart 46 : Frequency distribution of repetitive response, simple reaction time and choice reaction time



Experiment 4

Discrete Successive Choice Reaction Time - Reverse

This experiment was done to understand the extent of variation that occurs in reaction time as a result of change S-R mapping. So far in experiment 2, experiment 3 and experiment 4 - serial has maintained following S-R mapping :

Stimulus 4 - Response with right index finger

Stimulus 5 - Response with right middle finger

Stimulus F - Response with left index finger

Stimulus D - Response with left middle finger

In this experiment the S-R mapping has been reversed as following :

Stimulus 4 - Response with right middle finger

Stimulus 5 - Response with right index finger

Stimulus F - Response with left middle finger

Stimulus D - Response with left index finger

Such reversal is assumed to cost cognitive control processes and hence takes more time. Besides, such reversal require more practice trials to learn adequate task-specific responses. As in this experiment stimuli were presented in pairs, two sets of reaction times have been analysed here. Response to first stimuli has been termed as First Reaction and response to second stimuli has been termed as Second Reaction.

Hypothesis related to this experiment is hypothesis 7 "Choice reaction times - reverse stimuli shall be higher than the choice reaction times - serial." The objecitve 10 "To understand the trial-to-trial variations in individual performance under different experimental conditions in context of theoretical formulation of EPIC based SRD model of PRP procedures" is related to this experiment.

Table 47-1 shows Univariate analysis of variance : Tests of Between-Subjects Effects for Discrete Successive Choice Reaction Time - Reverse - First Reaction

Tests of Between-Subjects Effects

Dependent Variable: EXP4R1ST

Source	Type III Sum of Squares	df	Mean Square	F	Sig
Model	1582094793[a]	82	19293838 94	480 211	.000
HAND	227646.850	1	227646 850	5 666	.017
FINGER	102.348	1	102.348	.003	960
FNAME	53522064 7	20	2676103.236	66 607	000
HAND * FINGER	113885 250	1	113885 250	2 835	.092
HAND * FNAME	4207137.725	19	221428.301	5 511	.000
FINGER * FNAME	1201280 215	20	60064 011	1.495	.073
HAND * FINGER * FNAME	1252771.545	19	65935 344	1 641	039
Error	116837033	2908	40177 797		
Total	1698931826	2990			

a R Squared = 931 (Adjusted R Squared = 929)

Table 47-1 shows results of Between-Subjects effects on dependent variable Discrete Choice Reaction Time - Reverse - First reaction time attained by univariate analysis of variance. Main effects - Hand (right-left), and Fname (subjects) are significant at 0.017 and 0.000 level. Main effect of Finger (index-middle) is not significant. Two way interaction between Hand*Finger, and Finger*Fname are not significant, whereas Hand*Fname is significant at o.000 level. Three-way interaction among Hand*Finger*Fname is also significant at 0.039 level. Thus, Discrete Choice Reaction Time - Reverse - First reaction responses are significantly influenced by indepedent variables Hand, and Individual differences and their interactions.

Table 47-2 shows Univariate analysis of variance : Tests of Between-Subjects Effects for Discrete Successive Choice Reaction Time - Reverse - Second Reaction

Dependent Variable EXP4R2ND

Source	Type III Sum of Squares	df	Mean Square	F	Sig
Model	618329155[a]	82	7540599.448	344.684	000
HAND	100642 451	1	100642.451	4.600	.032
FINGER	98847 288	1	98847.288	4.518	034
FNAME	22771574 0	20	1138578 699	52.045	000
HAND * FINGER	18192.076	1	18192 076	832	362
HAND * FNAME	1216015.120	19	64000.796	2.926	.000
FINGER * FNAME	359985 691	20	17999 285	.823	688
HAND * FINGER * FNAME	469554 066	19	24713.372	1.130	.313
Error	63617874 2	2908	21876.848		
Total	681947029	2990			

a R Squared = 907 (Adjusted R Squared = .904)

Table 47-2 shows results of Between-Subjects effects on dependent variable Discrete Choice Reaction Time - Reverse - Second reaction time attained by univariate analysis of variance. Main effects - Hand (right-left), Finger (index-middle) and Fname (subjects) are significant at 0.032, 0.034 and 0.000 level respectively. Two way interaction between Hand*Finger, and Finger*Fname are not significant, whereas Hand*Fname is significant at 0.000 level. Three-way interaction among Hand*Finger*Fname is not significant. Thus, Discrete Choice Reaction Time -Reverse - Second reactions are significantly influenced by indepedent variables Hand, Finger and Individual differences.

Table 48 shows mean, SD and V of Discrete Successive Choice Reaction Time - Reverse - First reaction & Second reaction for Total, hands, fingers, stimuli and subjects

Independent Factors	First Reaction			Second Reaction			Mean Difference
	Mean	SD	V	Mean	SD	V	
Total	712.67	245.61	0.34	445.26	172.71	0.39	267.41
Right	701.67	235.90	0.34	449.94	178.35	0.40	251.73
Left	724.85	255.46	0.35	440.08	166.14	0.38	284.77
Index	709.63	250.93	0.35	451.41	174.53	0.39	258.22
Middle	715.67	240.29	0.34	439.20	170.73	0.39	276.47
4	705.95	248.69	0.35	451.49	181.73	0.40	254.46
5	697.39	222.44	0.32	448.39	175.00	0.39	249.00
D	735.61	257.03	0.35	429.18	165.49	0.39	306.43
F	713.77	253.53	0.36	451.31	166.18	0.37	262.46
Keyoor	718.56	203.95	0.28	478.99	150.15	0.31	239.57
Shweta	705.07	181.83	0.26	435.57	171.80	0.39	269.50
Veena	639.09	210.09	0.33	441.80	155.57	0.35	197.29
Shruti M.	700.79	229.91	0.33	216.53	101.74	0.47	484.26
Ruta	820.10	258.08	0.31	582.23	163.30	0.28	237.88
Sameena	691.23	199.40	0.29	430.38	128.50	0.30	260.85
Minal	666.76	108.66	0.16	462.72	99.37	0.21	204.04
Darshini	1004.23	260.42	0.26	545.26	195.91	0.36	458.96
Rohit	657.75	195.31	0.30	481.36	107.63	0.22	176.40
Sumit	802.77	243.72	0.30	419.74	185.69	0.44	383.03
Kiran	703.68	233.26	0.33	469.38	125.78	0.27	234.30
Aditi	587.49	120.65	0.21	358.74	102.81	0.29	228.75
Digvijay	512.93	129.04	0.25	371.72	114.07	0.31	141.21
Yogesh	770.15	213.53	0.28	356.12	211.46	0.59	414.03
Apurva	941.21	257.68	0.27	528.22	176.79	0.33	412.99
Ragam	542.24	189.41	0.35	395.30	120.84	0.31	146.94
Sangeeta	1037.17	265.49	0.26	523.02	200.86	0.38	514.15
Nidhi	688.00	212.28	0.31	212.23	43.88	0.21	475.77
Soham	655.99	191.34	0.29	436.38	113.43	0.26	219.61
Hamza	494.00	123.60	0.25	350.37	157.05	0.45	143.63
Shruti S.	693.10	178.00	0.26	586.70	194.32	0.33	106.41

Chart 47 : Mean & Sd of Discrete successive choice reaction time - reverse - First reaction & Second reaction

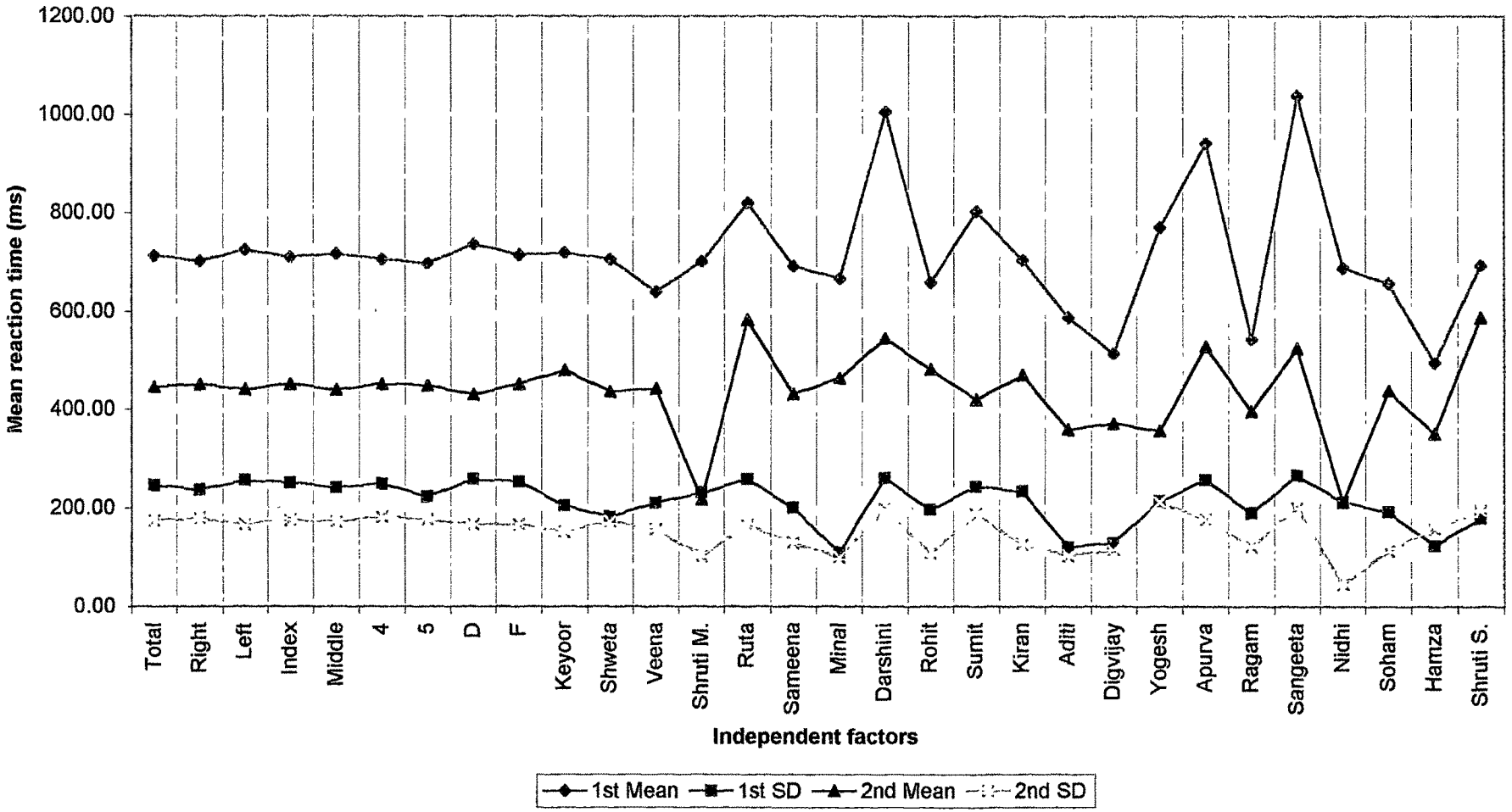


Table 48 and Chart 47 shows mean, SD and V for total, hands (right-left), fingers (index-middle), stimuli (4-5-D-F) and each subject for both Discrete Successive Choice Reaction Time - First reaction and Discrete Successive Choice Reaction Time - Second reaction.

Discrete successive choice reaction time - first reaction response of left hand (724. 85 ms) is significantly higher than right hand (701.67 ms) as can be seen in Table 48 and supported by Table 47-1. Right hand response time is less than total reponse time (712.67 ms), whereas left hand response time is more than total reponse time.

Discrete successive choice reaction time - first reaction response of index finger (709.63 ms) is not significantly different from middle finger (715.67 ms). Index finger response time is less than total response time, whereas middle finger response time is more than total response time. Discrete successive choice reaction time - first reaction response of stimuli 5 is lowest (697.39 ms - right hand middle finger), followed by stimuli 4 (705.95 ms - right hand index finger), stimuli F (713.77 ms - left hand index finger), and stimuli D (735.61 ms - left hand middle finger). Thus, right hand fingers are significantly faster than left hand fingers.

Individually, Digvijay is the fastest respondent with mean response time of 512.93 ms, whereas Sangeeta is the slowest respondent with mean response time of 1037.17 ms. The difference between this two response time is 524.24 ms.

Highest standard deviation has been observed in case of Sangeeta (265.49 ms), whereas lowest standard deviation has been observed in case of Minal (108.66 ms). Coefficient of Variation for all independent factors and almost all subject has continued to be varied.

Discrete successive choice reaction time - second reaction response of left hand (440.08 ms) is significantly higher than right hand (449.94 ms) as can be seen in Table 48 and supported by Table 47-2. Left hand response time is less than total reponse time (445.26 ms), whereas right hand response time is more than total reponse time.

Discrete successive choice reaction time - second reaction response of index finger (451.41 ms) is significantly higher from middle finger (439.20 ms). Index finger response time is more than total response time, whereas middle finger response time is less than total response time. Discrete successive choice reaction time - second reaction response of stimuli D is lowest (429.18 ms - left hand middle finger), followed by stimuli

5 (448.39 ms - right hand middle finger), stimuli 4 (451.49 ms - right hand index finger), and stimuli F (451.31ms - left hand index finger). Thus, left hand middle finger is fastest of all whereas reaction time of remaining fingers are more or less similar.

Individually, Nidhi is the fastest respondent with mean response time of 212.23 ms, whereas Shruti S. is the slowest respondent with mean response time of 586.70 ms. The difference between this two response time is 374.47 ms.

Highest standard deviation has been observed in case of Yogesh (211.46 ms), whereas lowest standard deviation has been observed in case of Nidhi (43.88 ms). Coefficient of Variation for all independent factors and almost all subjects have continued to be varied.

Chart 48 shows mean differences between Discrete successive choice reaction time - First reaction and Second reaction. for total, hands, fingers, stimuli and subjects. Mean differences are relatively less variable on independent factors hands, fingers and stimuli, however they are more varied subjectwise.

Table 42 and Chart 49 shows frequency distribution of response times under Experiment 2, 3 and 4 conditions. The second reaction time of Experiment 4 - Reverse is overlaps long serial reaction time of Experiment 3 - Serial reaction times. Thus, effects of reversal of stimulus mapping is least seen in second reaction time.

Chart 48 : Mean differences in 1st reaction & 2nd reaction of discrete successive choice reaction time - reverse

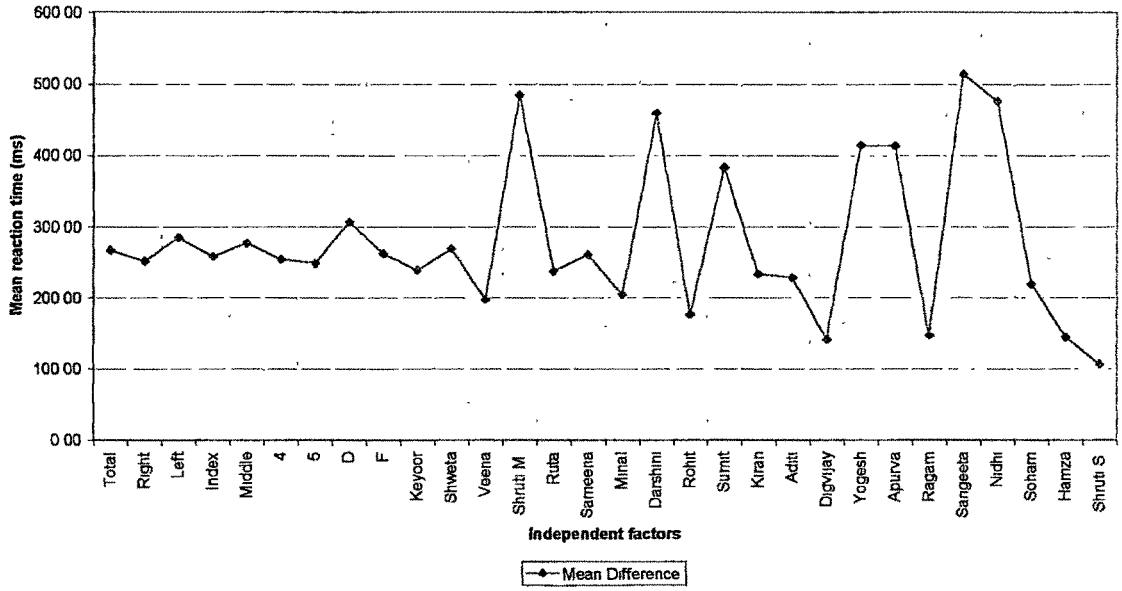


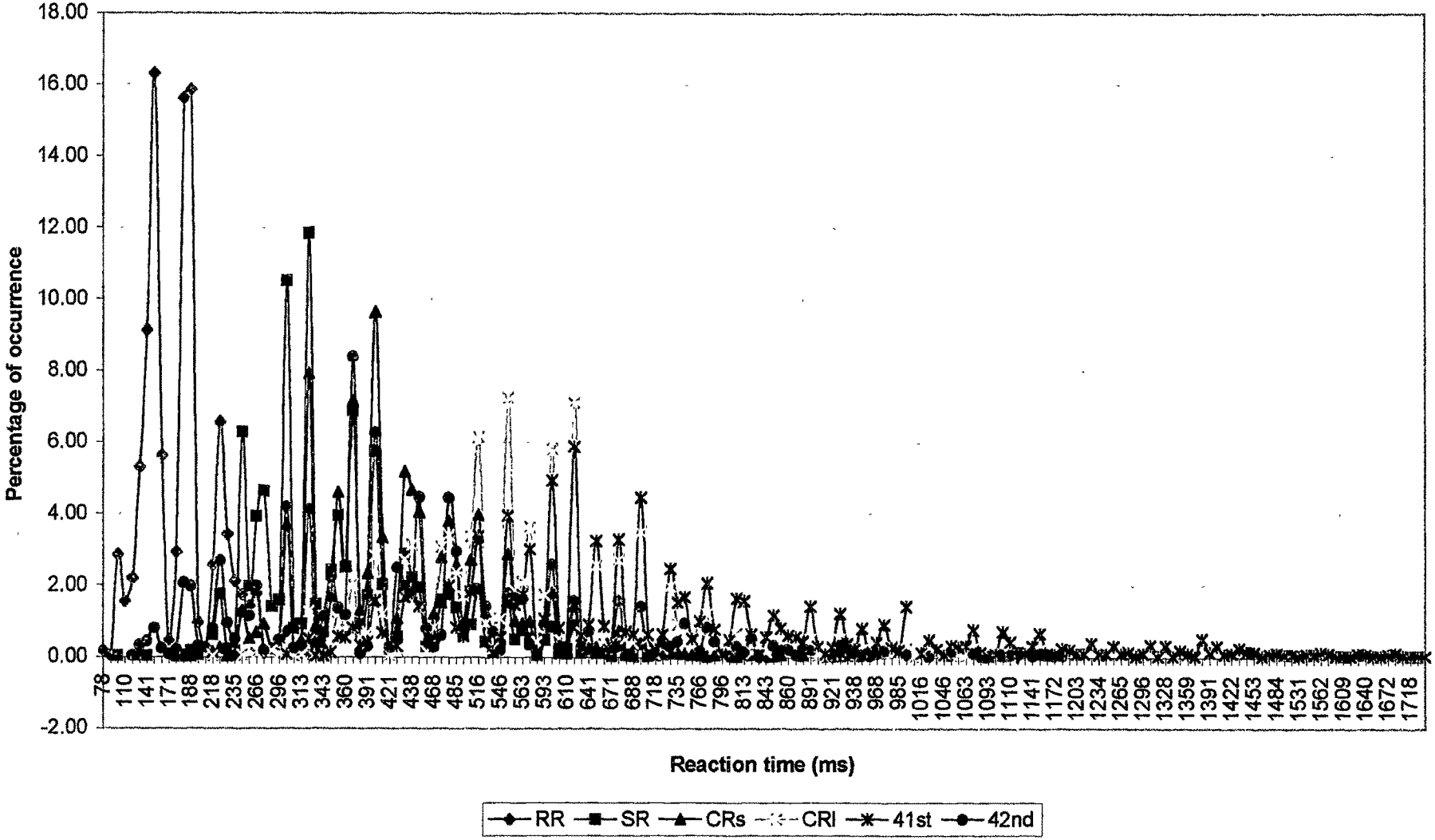
Table 49 shows frequency distribution of Discrete Successive Choice Reaction Time - First reaction, Second reaction and Serial for Total

RT	RR	SR	CRs	CRI	41st	42nd
78	0.17					
93	0.02					
109	2.86	0.03				0.03
110	1.55					
125	2.21					0.03
140	5.31	0.03				0.33
141	9.14	0.03				0.43
156	16.31					0.80
157	5.82					0.23
171	0.46					0.07
172	2.93	0.10	0.03			0.20
187	15.63	0.05	0.03			2.07
188	15.85	0.15	0.03			1.97
203	0.97	0.15	0.08			0.30
204	0.27					
218	2.57	0.64	0.13	0.03		0.80
219	6.57	1.74	0.26			2.68
234	3.42	0.20	0.03			0.94
235	2.11	0.15	0.05			0.50
250	1.75	6.29	1.29	0.05		1.24
265	1.43	1.97	0.52			1.14
266	1.77	3.91	0.67	0.08		1.97
281	0.12	4.63	0.90			0.17
282		1.41	0.23	0.19		
296	0.12	1.58	0.46	0.08		0.47
297	0.70	10.51	3.71	0.24	0.07	4.18
312		0.79	0.23	0.03		0.23
313	0.10	0.92	0.44	0.05		0.33
328	0.05	11.84	7.93	1.27	0.50	4.11
329		1.46	0.85	0.21	0.03	0.37
343		0.69	0.39	0.05	0.03	1.10
344		2.43	1.70	0.24	0.13	2.24
359		3.96	4.61	1.24	0.57	1.37
360		2.51	2.55	0.79	0.54	1.17
375		6.88	7.16	2.04	0.80	8.39
390		0.92	1.31	0.56	0.33	0.10
391		1.71	2.34	0.69	0.40	0.30
406		5.75	9.63	2.83	1.57	6.25
407		2.02	3.32	1.19	0.67	2.04
421		0.20	0.26	0.05		0.27
422		0.56	1.08	0.16	0.30	2.51
437		2.86	5.18	2.72	1.67	1.97
438		2.20	4.66	3.12	1.77	1.61
453		1.94	4.04	1.38	1.40	4.48
454		0.28	0.44	0.16		0.80
468		0.41	1.21	0.82	0.54	0.27
469		1.58	2.78	3.07	1.51	0.60
484		1.74	3.79	3.41	2.01	4.45
485		1.38	2.58	2.38	0.84	2.94
500		0.64	0.95	1.72	0.57	0.70
515		0.89	2.70	3.36	1.81	1.87
516		1.87	3.97	6.16	3.38	3.28
531		0.43	1.24	0.95	0.43	1.40
532		0.15	0.15	0.24	0.13	0.70
546		0.31	0.49	1.06	0.54	0.17
547		1.51	2.86	7.25	3.95	1.77
562		0.49	1.00	1.85	1.47	1.64
563		0.74	0.95	2.09	1.74	1.61
578		0.51	0.98	3.62	3.01	0.33
579		0.05	0.05	0.42	0.13	0.03
593		0.49	0.49	1.75	1.07	0.90
594		0.84	1.80	5.79	4.95	2.58
609		0.10	0.15	0.50	0.80	0.30
610		0.08	0.15	0.21	0.20	0.27
625		0.89	1.42	7.11	5.89	1.57
640		0.13	0.15	0.69	0.60	0.30
641		0.20	0.23	0.87	0.90	0.70
656		0.10	0.26	2.57	3.24	0.10
657		0.10	0.21	0.63	0.87	0.13
671		0.03	0.08	0.40	0.37	0.23
672		0.31	0.72	2.72	3.28	1.57
687			0.08	0.53	0.70	0.03
688		0.15	0.03	0.40	0.64	
703		0.36	0.39	3.52	4.48	1.40
704		0.03	0.08	0.56	0.64	0.03
718			0.05	0.08	0.20	0.13
719			0.10	0.26	0.64	0.37
734			0.13	1.98	2.47	0.30
735			0.13	0.90	1.54	0.43
750			0.10	0.79	1.67	0.94
765			0.05	0.34	0.50	
766			0.08	0.77	1.00	0.17
781			0.03	1.22	2.07	0.84
782			0.05	0.26	0.77	0.43
796					0.07	
797				0.21	0.47	0.03
812			0.03	0.83	1.64	0.30
813			0.10	0.56	1.57	0.13
828			0.05	0.13	0.64	0.54
829			0.03	0.03	0.07	0.03

Table 49 ...contd...

RT	RR	SR	CRs	CRI	41st	42nd
843			0.03	0.16	0.57	
844			0.03	0.53	1.17	0.33
859			0.05	0.34	0.80	0.17
860				0.24	0.60	0.20
875				0.32	0.57	0.07
890			0.05	0.34	0.43	0.20
891				0.50	1.40	0.17
906				0.05	0.30	
907			0.03	0.03	0.10	
921			0.03	0.08	0.27	0.03
922			0.03	0.50	1.20	0.33
937			0.05	0.11	0.37	0.10
938				0.16	0.23	0.13
953			0.05	0.21	0.80	0.07
954				0.03	0.10	0.03
968					0.40	0.10
969				0.29	0.90	0.17
984				0.11	0.27	
985				0.05	0.17	
1000			0.08	0.24	1.40	0.07
1015				0.03		
1016				0.03	0.13	
1031				0.21	0.47	0.03
1032				0.11	0.20	
1046					0.07	
1047			0.08	0.08	0.33	0.17
1062				0.05	0.27	
1063				0.03	0.30	
1078				0.26	0.77	0.10
1079					0.13	0.03
1093			0.03	0.05	0.03	
1094					0.07	
1109			0.05	0.11	0.70	0.03
1110				0.03	0.43	0.07
1125			0.03	0.05	0.13	0.13
1140				0.03	0.10	
1141				0.16	0.30	0.03
1156				0.21	0.67	0.10
1157				0.03	0.10	0.07
1172					0.07	0.03
1187					0.23	0.03
1188					0.20	
1203					0.10	
1218					0.10	
1219					0.37	
1234					0.07	
1235					0.10	
1250					0.30	
1265					0.10	
1266					0.13	
1281					0.03	
1296					0.10	
1297					0.33	
1312					0.03	
1328					0.33	
1343					0.03	
1344					0.17	
1359					0.10	
1360					0.03	
1375					0.50	
1391					0.13	
1406					0.30	
1407					0.07	
1422					0.10	
1437					0.23	
1438					0.13	
1453					0.13	
1468					0.03	
1469					0.07	
1484					0.10	
1515					0.07	
1516					0.07	
1531					0.03	
1532					0.07	
1547					0.07	
1562					0.13	
1563					0.10	
1578					0.03	
1609					0.03	
1610					0.03	
1625					0.10	
1640					0.07	
1641					0.03	
1656					0.03	
1672					0.07	
1703					0.10	
1704					0.03	
1718					0.03	
1734					0.03	
1735					0.03	

Chart 49 : Combined percentage distribution



Conclusion :

As the mean difference between choice reaction times of serial and choice reaction times - reverse is more than 18 ms both means differ significantly and paired sample t test is not requisite. Therefore data and results support hypothesis 7 "Choice reaction times - reverse stimuli shall be higher than the choice reaction times - serial."

Besides, above data also indicates trial-to-trial variations in individual performance under different experimental conditions in context of theoretical formulation of EPIC based SRD model of PRP procedures". In fact Chart 49 clearly shows that there are range of response times which are common to all experimental condition - Experiment 2 - Repetitive resonpese to Experiment 4 - reversed S-R mapping. This is interesting because, underlying cognitive and motor processes are presumed to be different under different conditions.

Experiment 4

Discrete Successive Choice Reaction Time - Alternate

This experiment was done to understand how much variation occurs in reaction time as a result of switching operation between two S-R mappings. Such switching operations are presumed to cost cognitive time. Again, in this experiment also, stimuli were presented in pairs, and so two sets of reaction times have been analysed. Response to first stimuli has been termed as First Reaction and response to second stimuli has been termed as Second Reaction.

This experiment is related to hypothesis 8 "Choice reaction times - alternate stimuli shall be higher than the choice reaction times - repeat." The objecitve 10 "To understand the trial-to-trial variations in individual performance under different experimental conditions in context of theoretical formulation of EPIC based SRD model of PRP procedures" is related to this experiment.

Table 50 shows Univariate analysis of variance : Tests of Between-Subjects Effects for Discrete Successive Choice Reaction Time - Alternate - First Reaction

Dependent Variable: EXP4A1ST

Source	Type III Sum of Squares	df	Mean Square	F	Sig
Model	1271149343[a]	84	15132730 27	540 275	.000
HAND	345661 273	1	345661.273	12.341	.000
FINGER	133617 598	1	133617.598	4.770	029
FNAME	52697934 8	20	2634896.741	94 072	000
HAND * FINGER	367721.491	1	367721.491	13 129	.000
HAND * FNAME	3100529.463	20	155026.473	5 535	.000
FINGER * FNAME	1546705 256	20	77335 263	2.761	.000
HAND * FINGER * FNAME	513628 802	20	25681.440	.917	.565
Error	98228617.3	3507	28009 301		
Total	1369377960	3591			

a. R Squared = 928 (Adjusted R Squared = .927)

Table 50 shows results of Between-Subjects effects on dependent variable Discrete Choice Reaction Time - Alternate - First reaction time attained by univariate analysis of variance. Main effects - Hand (right-left), Finger (index-middle) and Fname (subjects) are significant at 0.000, 0.029 and 0.000 level respectively. All two way interaction between Hand*Finger, Hand*Fname and Finger*Fname are significant at 0.000 level. Three-way interaction among Hand*Finger*Fname is not significant. Thus, Discrete Choice Reaction Time - Alternate - First reaction responses are significantly influenced by indepedent variables Hand, Finger, Individual differences and their interactions.

Table 51 shows Univariate analysis of variance : Tests of Between-Subjects Effects for Discrete Successive Choice Reaction Time - Alternate - Second Reaction

Dependent Variable: EXP4A2ND

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Model	714740927[a]	84	8508820.561	632.843	.000
HAND	120891.038	1	120891.038	8.991	.003
FINGER	7566 266	1	7566 266	.563	.453
FNAME	18005408.0	20	900270 400	66.958	.000
HAND * FINGER	55025.830	1	55025.830	4 093	.043
HAND * FNAME	2165415 249	20	108270 762	8 053	.000
FINGER * FNAME	234700 059	20	11735.003	873	.623
HAND * FINGER * FNAME	198624.648	20	9931.232	.739	.789
Error	47153003.9	3507	13445 396		
Total	761893931	3591			

a R Squared = .938 (Adjusted R Squared = 937)

Table 51 shows results of Between-Subjects effects on dependent variable Discrete Choice Reaction Time - Alternate - Second reaction time attained by univariate analysis of variance. Main effects - Hand (right-left), and Fname (subjects) are significant at 0.000 level, whereas main effect Finger (index-middle) is not significant. Two way interaction between Hand*Finger, and Hand*Fname are significant at 0.043 and 0.000 level respectively, whereas Finger*Fname is not significant. Three-way interaction among Hand*Finger*Fname is not significant. Thus, Discrete Choice Reaction Time - Alternate - Second reactions are significantly influenced by indepedent variables Hand, Individual differences and their interactions.

Table 52 shows mean, SD and V of Discrete Successive Choice Reaction Time - Alternat - First reaction & Second reaction for Total, hands, fingers, stimuli and subjects

Independent Factors	First Reaction			Second Reaction			Mean Difference
	Mean	SD	V	Mean	SD	V	
Total	581.08	209.04	0.36	439.65	137.40	0.31	141.43
Right	568.88	211.76	0.37	443.53	139.21	0.31	125.35
Left	593.72	205.48	0.35	435.63	135.42	0.31	158.09
Index	574.08	208.33	0.36	440.82	135.68	0.31	133.26
Middle	588.18	209.57	0.36	438.47	139.15	0.32	149.71
4	572.03	209.70	0.37	441.27	137.03	0.31	130.77
5	565.56	213.98	0.38	445.91	141.51	0.32	119.65
D	610.75	202.70	0.33	431.04	136.43	0.32	179.71
F	576.29	206.95	0.36	440.34	134.29	0.30	135.95
Keyoor	580.71	172.32	0.30	439.80	116.20	0.26	140.91
Shweta	461.12	114.59	0.25	376.93	115.36	0.31	84.19
Veena	514.90	140.52	0.27	425.84	114.54	0.27	89.06
Shruti M.	649.81	231.83	0.36	523.95	126.03	0.24	125.86
Ruta	703.93	241.99	0.34	529.14	118.41	0.22	174.79
Sameena	581.99	136.19	0.23	460.67	111.52	0.24	121.32
Minal	584.73	109.67	0.19	440.43	99.44	0.23	144.30
Darshini	762.10	307.84	0.40	585.05	202.30	0.35	177.05
Rohit	529.56	94.08	0.18	407.10	76.57	0.19	122.46
Sumit	575.97	173.44	0.30	410.16	103.88	0.25	165.81
Kiran	516.66	166.39	0.32	416.64	107.49	0.26	100.02
Aditi	552.30	182.11	0.33	441.20	107.49	0.24	111.10
Digvijay	467.31	98.50	0.21	365.20	78.52	0.21	102.11
Yogesh	551.53	131.34	0.24	249.97	85.04	0.34	301.56
Apurva	1048.04	322.16	0.31	563.16	138.45	0.25	484.89
Ragam	481.15	117.52	0.24	369.02	112.82	0.31	112.13
Sangeeta	671.33	178.14	0.27	546.09	146.98	0.27	125.24
Nidhi	590.45	124.88	0.21	468.01	133.20	0.28	122.43
Soham	530.61	160.86	0.30	387.15	94.97	0.25	143.46
Hamza	424.04	87.06	0.21	363.36	138.19	0.38	60.68
Shruti S.	571.63	135.06	0.24	444.85	116.88	0.26	126.79

Chart 50 : Mean & SDof Discrete successive choice reaction time - Alternate - First reaction & Second reaction

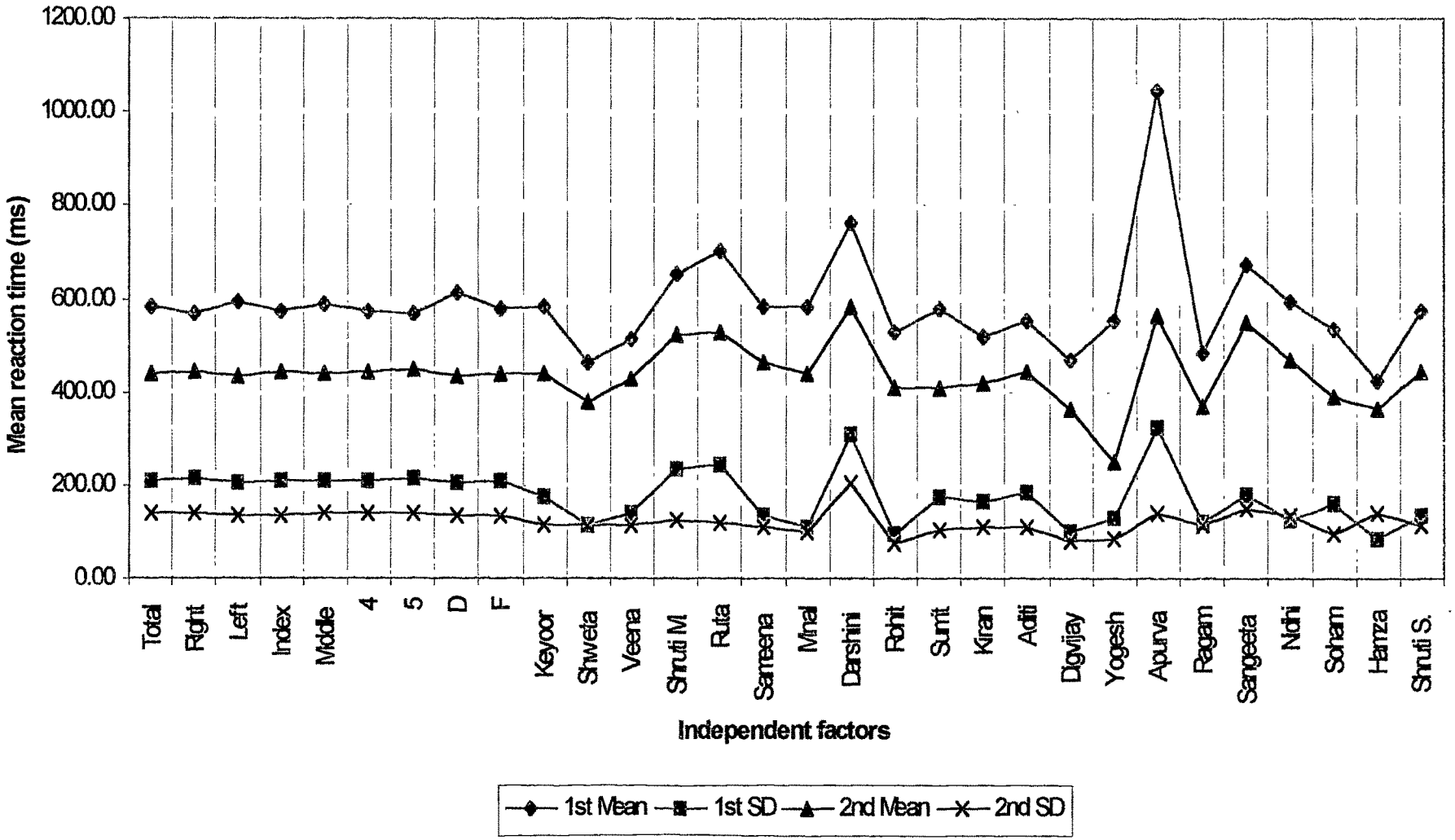


Table 52 and Chart 50 shows mean, SD and V for total, hands (right-left), fingers (index-middle), stimuli (4-5-D-F) and each subject for both Discrete Successive Choice Reaction Time - Alternate - First reaction and Discrete Successive Choice Reaction Time - Alternate - Second reaction.

Discrete successive choice reaction time - alternate - first reaction response of left hand (593.72 ms) is significantly higher than right hand (568.88 ms) as can be seen in Table 52 and supported by Table 50. Right hand response time is less than total reponse time (581.08 ms), whereas left hand response time is more than total reponse time.

Discrete successive choice reaction time - alternate - first reaction response of index finger (574.08 ms) is significantly different from middle finger (588.18 ms). Index finger response time is less than total response time, whereas middle finger response time is more than total response time. Discrete successive choice reaction time - alternate - first reaction response of stimuli 5 is lowest (565.56 ms - right hand middle finger), followed by stimuli 4 (572.03 ms - right hand index finger), stimuli F (576.29 ms - left hand index finger), and stimuli D (610.75 ms - left hand middle finger). Thus, right hand fingers are significantly faster than left hand fingers.

Individually, Hamza is the fastest respondent with mean response time of 424.04 ms, whereas Apurva is the slowest respondent with mean response time of 1048.04 ms. The difference between this two response time is 624 ms.

Highest standard deviation has been observed in case of Apurva (322.16 ms), whereas lowest standard deviation has been observed in case of Hamza (87.06 ms). Coefficient of Variation for all independent factors and almost all subjectd have continued to be varied.

Discrete successive choice reaction time - alternate - second reaction response of left hand (435.63 ms) is significantly less than right hand (443.53 ms) as can be seen in Table 52 and supported by Table 50. Left hand response time is less than total reponse time (439.85 ms), whereas right hand response time is more than total reponse time.

Discrete successive choice reaction time - second reaction response of index finger (440.82 ms) is not significantly different from middle finger (438.47 ms). Both Index finger response time and middle finger response times are almost similar to the

total response time. Discrete successive choice reaction time - second reaction response of stimuli D is lowest (431.04 ms - left hand middle finger), followed by stimuli F (440.34 ms - left hand index finger), stimuli 4 (441.27 ms - right hand index finger), and stimuli 5 (445.91 ms - right hand middle finger). Thus, left hand fingers are faster than right hand fingers.

Individually, Yogesh is the fastest respondent with mean response time of 249.97 ms, whereas Darshini is the slowest respondent with mean response time of 585.05 ms. The difference between this two response time is 335.08 ms.

Highest standard deviation has been observed in case of Darshini (202.30 ms), whereas lowest standard deviation has been observed in case of Rohit (76.57 ms). Coefficient of Variation for all independent factors and almost all subject have continued to be varied.

Chart 48 shows mean differences between Discrete successive choice reaction time - First reaction and Second reaction. for total, hands, fingers, stimuli and subjects. Mean differences are relatively less variable on independent factors hands, fingers and stimuli, however they are more varied subjectwise.

Table 53 and Chart 52 shows frequency distribution of response times under Experiment 4 serial, reverse and alternate conditions.

Chart 51 : Mean differences in 1st reaction and 2nd reaction of discrete successive choice reaction time - alternate

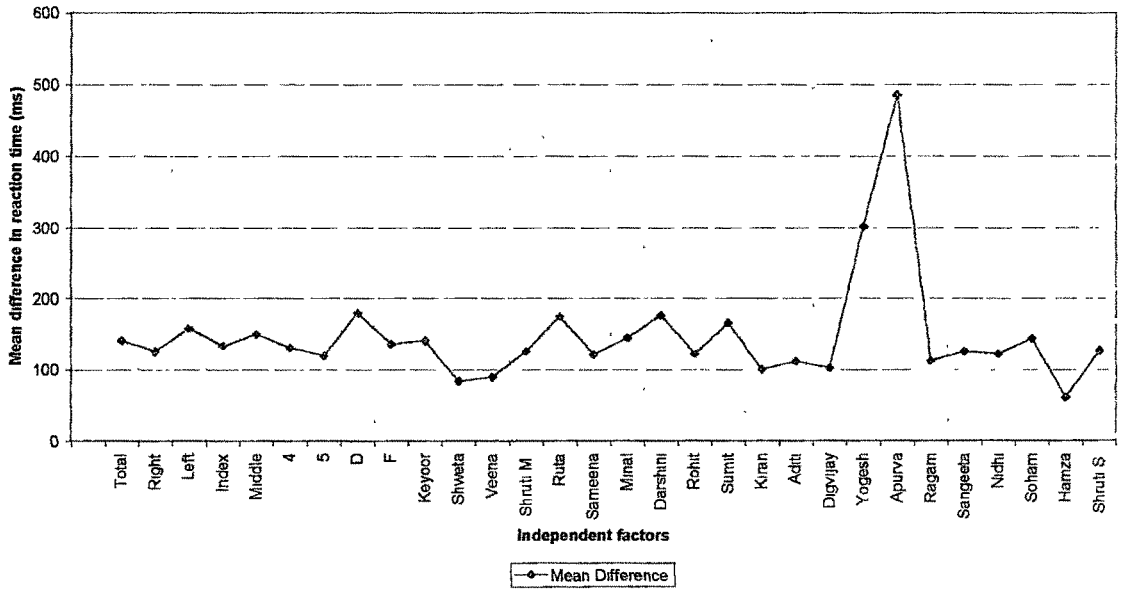


Table 53 shows frequency distribution of Discrete Successive Choice Reaction Time - Alternate - First reaction, Second reaction and Serial for Total

RT	Ss	Sl	R1st	R2nd	A1st	A2nd
78						
93						
109				0.03		
110						0.06
125				0.03		
140				0.33		0.06
141				0.43		0.08
156				0.80		0.17
157				0.23		0.03
171				0.07		
172	0.03			0.20		0.08
187	0.03			2.07		0.33
188	0.03			1.97		0.47
203	0.08			0.30		0.08
204						
218	0.13	0.03		0.80		0.39
219	0.26			2.68		0.86
234	0.03			0.94		0.53
235	0.05			0.50		0.22
250	1.29	0.05		1.24		1.39
265	0.52			1.14	0.03	0.92
266	0.67	0.08		1.97	0.06	1.89
281	0.90			0.17	0.03	0.25
282	0.23	0.19				0.17
296	0.46	0.08		0.47	0.06	0.72
297	3.71	0.24	0.07	4.18	0.56	5.46
312	0.23	0.03		0.23	0.06	0.58
313	0.44	0.05		0.33	0.08	0.53
328	7.93	1.27	0.50	4.11	1.45	5.46
329	0.85	0.21	0.03	0.37	0.19	0.86
343	0.39	0.05	0.03	1.10	0.11	1.62
344	1.70	0.24	0.13	2.24	0.31	4.09
359	4.61	1.24	0.57	1.37	1.34	2.31
360	2.55	0.79	0.54	1.17	1.28	1.20
375	7.16	2.04	0.80	8.39	2.90	10.89
390	1.31	0.56	0.33	0.10	0.67	0.31
391	2.34	0.69	0.40	0.30	1.31	0.45
406	9.63	2.83	1.57	6.25	4.48	7.77
407	3.32	1.19	0.67	2.04	1.64	2.28
421	0.26	0.05		0.27	0.08	0.45
422	1.08	0.16	0.30	2.51	0.67	2.31
437	5.18	2.72	1.67	1.97	3.87	1.98
438	4.66	3.12	1.77	1.81	3.65	2.23
453	4.04	1.38	1.40	4.48	2.03	5.12
454	0.44	0.16		0.80	0.31	0.89
468	1.21	0.82	0.54	0.27	1.25	0.45
469	2.78	3.07	1.51	0.60	3.79	0.75
484	3.79	3.41	2.01	4.45	4.20	3.90
485	2.58	2.38	0.84	2.94	2.26	2.28
500	0.95	1.72	0.57	0.70	2.23	0.33
515	2.70	3.36	1.81	1.87	3.48	1.78
516	3.97	6.16	3.38	3.28	5.51	2.42
531	1.24	0.95	0.43	1.40	1.56	1.34
532	0.15	0.24	0.13	0.70	0.31	0.45
546	0.49	1.06	0.54	0.17	0.95	0.33
547	2.86	7.25	3.95	1.77	5.49	1.84
562	1.00	1.85	1.47	1.64	1.81	1.39
563	0.95	2.09	1.74	1.61	1.50	1.64
578	0.98	3.62	3.01	0.33	2.67	0.45
579	0.05	0.42	0.13	0.03	0.33	0.06
593	0.49	1.75	1.07	0.90	1.09	0.67
594	1.80	5.79	4.95	2.58	3.29	2.53
609	0.15	0.50	0.80	0.30	0.89	0.22
610	0.15	0.21	0.20	0.27	0.45	0.31
625	1.42	7.11	5.89	1.57	3.70	1.59
640	0.15	0.69	0.60	0.30	0.58	0.50
641	0.23	0.87	0.90	0.70	0.97	1.00
656	0.26	2.57	3.24	0.10	2.23	0.75
657	0.21	0.63	0.87	0.13	0.72	0.08
671	0.08	0.40	0.37	0.23	0.36	0.11
672	0.72	2.72	3.28	1.57	2.20	1.48
687	0.08	0.53	0.70	0.03	0.47	0.08
688	0.03	0.40	0.64		0.42	0.03
703	0.39	3.52	4.48	1.40	1.64	1.23
704	0.08	0.56	0.64	0.03	0.28	0.08
718	0.05	0.08	0.20	0.13	0.06	0.14
719	0.10	0.26	0.64	0.37	0.45	0.42
734	0.13	1.98	2.47	0.30	0.70	0.31
735	0.13	0.90	1.54	0.43	0.81	0.14
750	0.10	0.79	1.67	0.94	0.81	0.70
765	0.05	0.34	0.50		0.28	0.03
766	0.08	0.77	1.00	0.17	0.47	0.03
781	0.03	1.22	2.07	0.84	0.89	0.47
782	0.05	0.26	0.77	0.43	0.45	0.22
796			0.07			
797		0.21	0.47	0.03	0.36	0.06
812	0.03	0.63	1.64	0.30	0.53	0.17
813	0.10	0.56	1.57	0.13	0.70	0.11
828	0.05	0.13	0.64	0.54	0.25	0.17
829	0.03	0.03	0.07	0.03		0.03

Table 53 ...contd...

RT	Ss	Sl	R1st	R2nd	A1st	A2nd
843	0.03	0.16	0.57		0.06	0.06
844	0.03	0.53	1.17	0.33	0.56	0.11
859	0.05	0.34	0.80	0.17	0.28	0.22
860		0.24	0.60	0.20	0.22	0.22
875		0.32	0.57	0.07	0.36	
890	0.05	0.34	0.43	0.20	0.33	0.08
891		0.50	1.40	0.17	0.53	0.17
906		0.05	0.30		0.08	0.06
907	0.03	0.03	0.10			
921	0.03	0.08	0.27	0.03	0.11	0.03
922	0.03	0.50	1.20	0.33	0.36	0.03
937	0.05	0.11	0.37	0.10	0.22	0.06
938		0.16	0.23	0.13	0.17	0.14
953	0.05	0.21	0.80	0.07	0.39	
954		0.03	0.10	0.03	0.06	
968			0.40	0.10	0.03	
969		0.29	0.90	0.17	0.25	0.14
984		0.11	0.27		0.08	
985		0.05	0.17		0.08	
1000	0.08	0.24	1.40	0.07	0.56	
1015		0.03			0.06	
1016		0.03	0.13		0.08	
1031		0.21	0.47	0.03	0.17	0.03
1032		0.11	0.20			0.03
1046			0.07		0.03	
1047	0.08	0.08	0.33	0.17	0.17	0.08
1062		0.05	0.27		0.08	
1063		0.03	0.30		0.08	
1078		0.26	0.77	0.10	0.19	
1079			0.13	0.03	0.06	
1093	0.03	0.05	0.03			
1094			0.07		0.03	
1109	0.05	0.11	0.70	0.03	0.25	
1110		0.03	0.43	0.07	0.03	
1125	0.03	0.05	0.13	0.13	0.08	
1140		0.03	0.10		0.03	
1141		0.16	0.30	0.03	0.11	
1156		0.21	0.67	0.10	0.22	
1157		0.03	0.10	0.07	0.08	
1172			0.07	0.03		
1187			0.23	0.03	0.11	
1188			0.20		0.14	
1203			0.10		0.11	
1218			0.10			
1219			0.37		0.17	
1234			0.07		0.08	
1235			0.10		0.03	
1250			0.30		0.08	
1265			0.10			
1266			0.13		0.17	
1281			0.03		0.03	
1282					0.03	
1296			0.10			
1297			0.33		0.19	
1312			0.03		0.03	
1313					0.06	
1328			0.33		0.08	
1343			0.03		0.03	
1344			0.17		0.17	
1359			0.10		0.03	
1360			0.03		0.08	
1375			0.50		0.11	
1391			0.13		0.03	
1406			0.30		0.14	
1407			0.07		0.03	
1422			0.10		0.11	
1437			0.23		0.03	
1438			0.13		0.03	
1453			0.13		0.06	
1468			0.03			
1469			0.07		0.03	
1484			0.10		0.08	
1485					0.03	
1500					0.06	
1515			0.07		0.11	
1516			0.07			
1531			0.03		0.03	
1532			0.07		0.03	
1547			0.07		0.06	
1562			0.13		0.03	
1563			0.10		0.11	
1578			0.03			
1593					0.06	
1594					0.06	
1609			0.03			
1610			0.03			
1625			0.10			
1640			0.07		0.06	
1641			0.03		0.11	
1656			0.03			
1672			0.07			
1703			0.10			
1704			0.03			
1718			0.03			
1734			0.03			
1735			0.03			

Chart 52 : Combined frequency distribution of Experiment 4 - serial, reverse and alternate

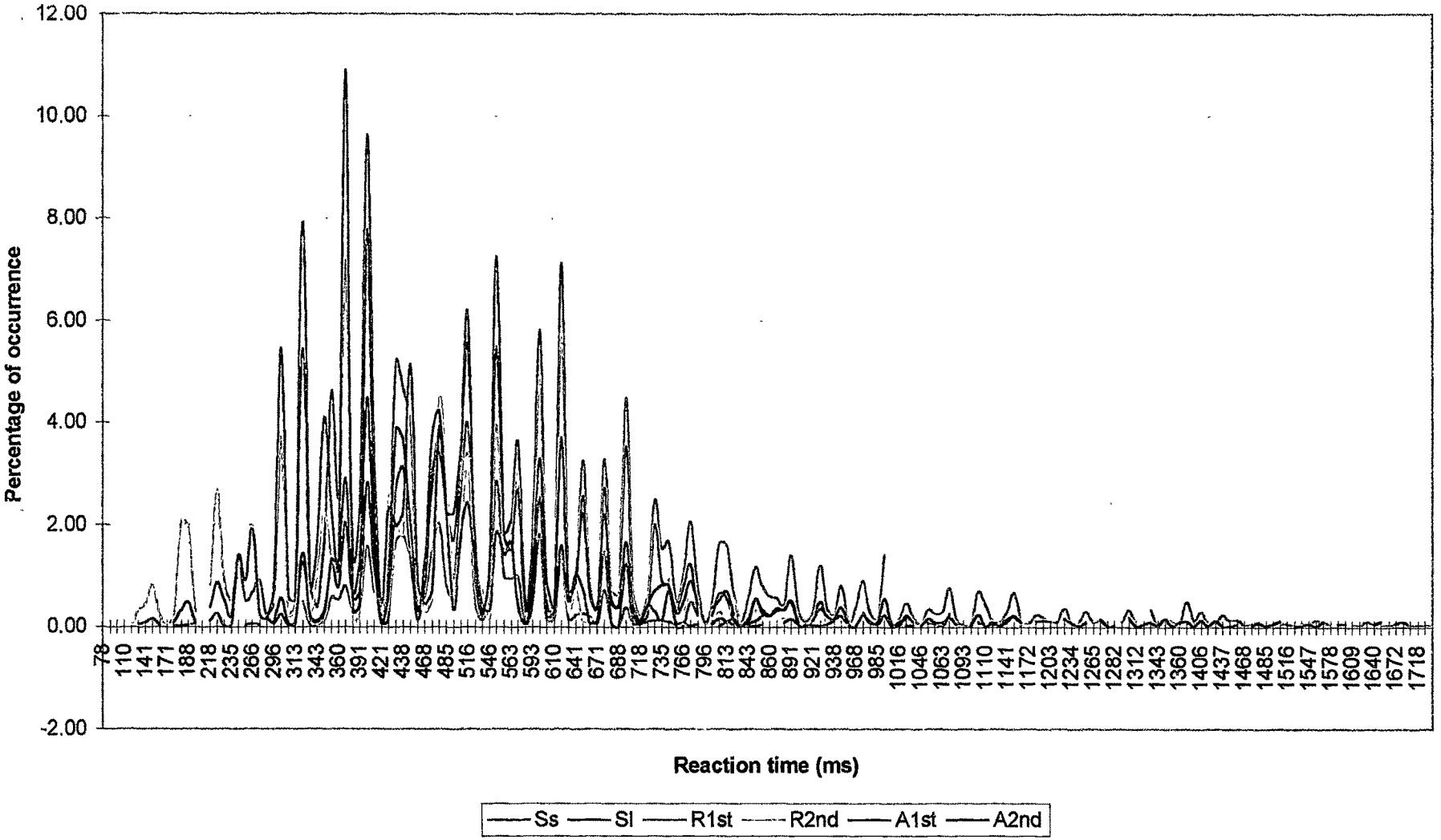


Table 54 shows paired sample t test statistics between Experiment 4 reverse and alternate

	Descriptive Statistics				Paired Statistics					
Pairs	Mean	N	SD	SEM	Mean	SD	SEM	t	df	Sig.
EXP4R1ST	707.12	2617	242 28	4.74	131 24	275 62	5 39	24 36	2616	0 00
EXP4A1ST	575.88	2617	201.87	3 95						
EXP4R1ST	707 12	2617	242.28	4.74	268.69	250 33	4.89	54.91	2616	0 00
EXP4A2ND	438 42	2617	135 75	2 65						
EXP4R2ND	443 00	2617	169.67	3 32	-132.88	252 55	4.94	-26.92	2616	0.00
EXP4A1ST	575 88	2617	201 87	3 95						
EXP4R2ND	443 00	2617	169 67	3.32	4 57	202 17	3 95	1 16	2616	0.25
EXP4A2ND	438.42	2617	135 75	2.65						

Conclusion :

Table 54 shows the mean difference between Discrete successive choice reaction times - reverse - first reaction, Discrete successive choice reaction times - reverse - second reaction, Discrete successive choice reaction times - alternate - first reaction and Discrete successive choice reaction times - alternate - second reaction. Of all four possible pairs three pairs (reverse 1st - 1st alternate; reverse 1st - 2nd alternate; reverse 2nd - 2nd alternate), are significant whereas the last pair (reverse 2nd - 2nd alternate) between reverse second reaction and alternate second reaction is not significantly different. Thus, hypothesis 8 "Choice reaction times - alternate stimuli shall be higher than the choice reaction times - repeat." is partially accepted.

Because of non-significant paired difference between alternate second reaction and reverse second reaction, it can be concluded that switching task has not influenced the cognitive and motor process timings in the experiment.

Besides, Chart 52 shows trial-to-trial variations in individual performance under different experimental conditions in context of theoretical formulation of EPIC based SRD model of PRP procedures. The pattern of frequency distribution is an evidence for counterintuitive findings that switching task has not led to any significant time delay in current task performance.

Experiment 5

Discrete Concurrent Choice Reaction Time - Dual

The objectives of this experiment are to demonstrate PRP effect in current task environment under varying response priority. Objective 1 relates to PRP effect when primary task is Task 1 and secondary task is Task 2, whereas Objective 2 is about PRP effect when primary task is Task 2 and secondary task is Task 1. Objective relates to differences in PRP effect among Cautious and Daring individuals.

Appropriate experimental outcomes therefore hypothesized are as follows -

Hypothesis 9 : PRP effect in T1 priority task shall be as per the standard PRP effect curve.

Hypothesis 10 : PRP effect shall be different in T2 priority task in comparison to standard PRP effect curve.

Hypothesis 11 : PRP effect shall be different in subject decision priority task (random) in comparison to standard PRP effect curve.

Obviously data analysis focuses more on visual representation of PRP effect under varying experimental conditions. Thus, data has been compiled and represented graphically and described with respect to objectives and hypotheses of the experiment. Firstly, 3 charts of PRP effect under T1T2, T2T1, and random conditions are presented along with description. This is followed by three individual PRP effect charts in order to support the argument of individual differences in PRP effect.

Finally, response time distributions for different SOAs under standard PRP experiment condition (T1T2) has been presented in order to highlight the overlap of response times under varying SOA conditions.

Table 55 shows reaction time of task 1 and task 2 in T1T2 response priority condition

	0	200	400	600	800
RT1	524.85	502.01	475.82	509.51	550.85
RT2	844.49	631.89	525.48	518.02	518.91

Table 55 shows reaction time 1 (RT1) of task 1 (T1) and reaction time 2 (RT2) of task 2 (T2) at different SOAs for T1T2 task priority condition in discrete concurrent choice reaction time - dual experiment. Chart 53 shows graphical representation of both reaction time as a function of SOAs. The chart shows following characteristics of RT2 :

1. Task 2 Reaction Time is higher at short SOA than at long SOA.

2. The slope of the PRP curve nearly equals -1 at short SOAs.

3. PRP effect at zero SOA is less that Task 1 RTs.

Above characteristics are similar to the theoretical PRP curve characteristics and empirically obtainted PRP curve characteristics. Thus, hypothesis 9 "PRP effect in T1 priority task shall be as per the standard PRP effect curve" is supported.

Chart 53 : Expt - 5 Dual task - T1T2

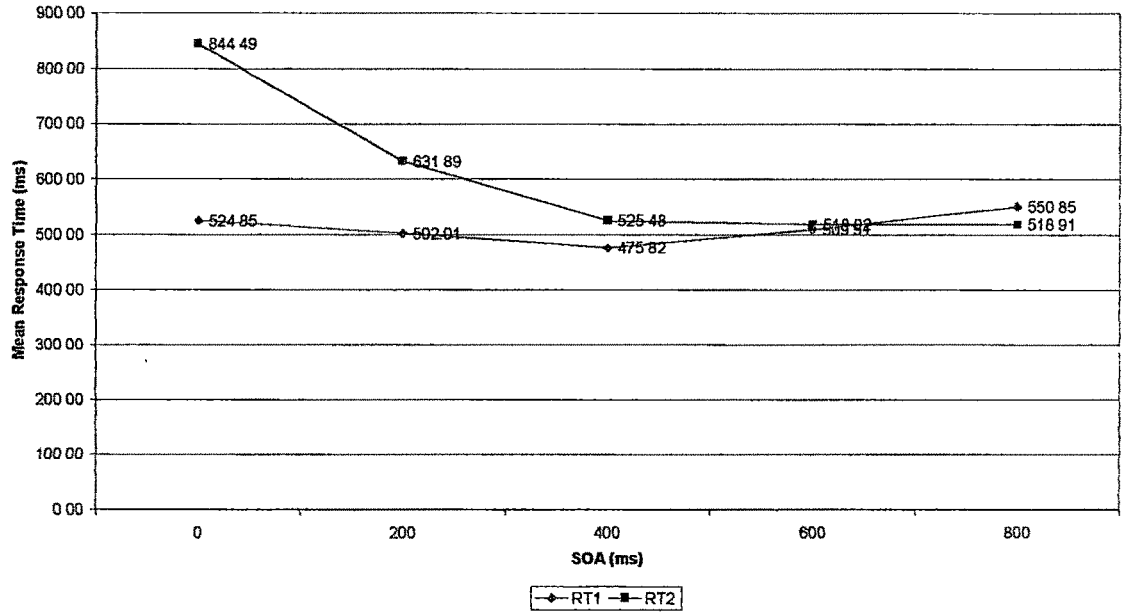


Table 56 shows Reaction times of task 1 and task 2 in T2T1 response priority conditions

	0	*200*	*400*	*600*	*800*
RT1	923.85	1125.07	1289.25	1529.85	1750.92
RT2	698.62	710.22	672.45	696.80	677.21
RT1 - SOA	923.85	925.07	889.25	929.85	950.92
RT1 - (SOA+RT2)	225.23	214.85	216.80	233.05	273.71

Table 56 shows reaction time 1 (RT1) of task 1 (T1) and reaction time 2 (RT2) of task 2 (T2) at different SOAs for T2T1 task priority condition in discrete concurrent choice reaction time - dual experiment. In this condition of experiment, subject was supposed to follow sequence of responding as given below :

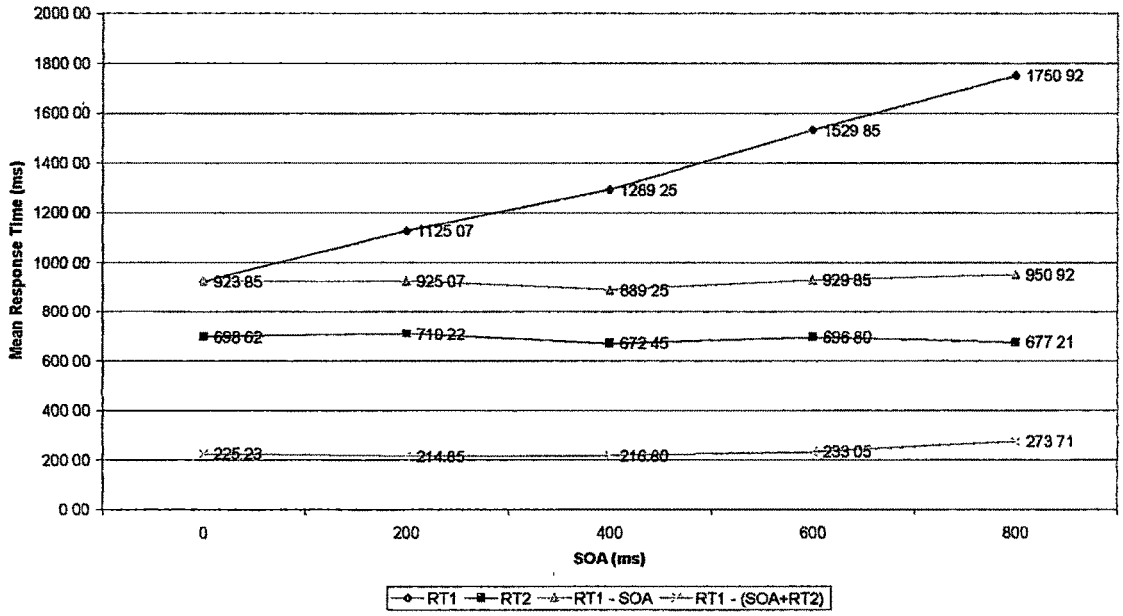
1. Identify T1 stimuli but withhold response

2. Identify T2 stimuli and immediately respond to it.

3. From memory give response to T1 stimuli.

Thus, RT1 will be influenced by SOA and RT2. Above table shows RT1 after subtraction of SOA and also after subtraction of SOA + RT2 both. Chart below shows graphical representation of both reaction time as a function of SOAs. Not a single typical characteristic of PRP curve has emerged for RT2. Thus, hypothesis 10 "PRP effect shall be different in T2 priority task in comparison to standard PRP effect curve"

Chart 54 : Expt 5 dual - T2T1



is supported, as no standard PRP effect has been observed.

Although RT2 seems to have increased in T2T1 condition, it remains uniform for all SOA conditions. Thus, it can be concluded that simultaneous processing of T1 response leads to some interference of T2 processing irrespective of SOA and therefore increases RT2. This is possible because at the instance of responding to T2, T1 processes are either held in working memory (in cases of SOAs other than 0) or are being processed simultaneously (at 0 SOA) and thus interference arises and remains uniform for all SOAs. Whereas T1 has advantage of simultaneously processing. Both the stages of stimulus identification and response production are finished while T2 responses are in progress and thus actual RT1 is much less than even simple reaction time of Experiment 3 but a little more than repetitive reaction time of Experiment 2.

It was assumed that task conditions are imposed on the subject and therefore may be a cognitive burden. If subjects are given free choice of response priority, than PRP effect might turn out different from the previous two conditions. Table 57 and Chart 55 shows reaction times when subjects voluntarily selected T1T2 response priority. Table 59 and Chart 56 shows reaction times when subjects voluntarily selected T2T1 response priority.

Table 57 shows Reaction time of task 1 and task 2 in T1T2 response priority condition

	0	200	400	600	800
RT1	543.57	540.08	534.35	519.03	549.51
RT2	838.56	608.04	555.37	503.72	480.20

Table 58 shows Reaction times of task 1 and task 2 in T2T1 response priority conditions

	0	200	400	600	800
RT1	824.27	987.86	1104.76	1371.64	1640.69
RT2	626.65	593.22	570.90	591.72	658.16
RT1 - SOA	824.27	787.86	704.76	771.64	840.69
RT1 - (SOA + RT2)	197.62	194.64	133.86	179.92	182.52

Charts overleaf shows graphical presentation of above data. In voluntarily chosen T1T2 response priority conditions results remain almost same as that of T1T2 response priority condition dictated by the experimenter. Whereas in voluntarily chosen T2T1

Chart 55 : Expt 5 Dual - Random - T1T2

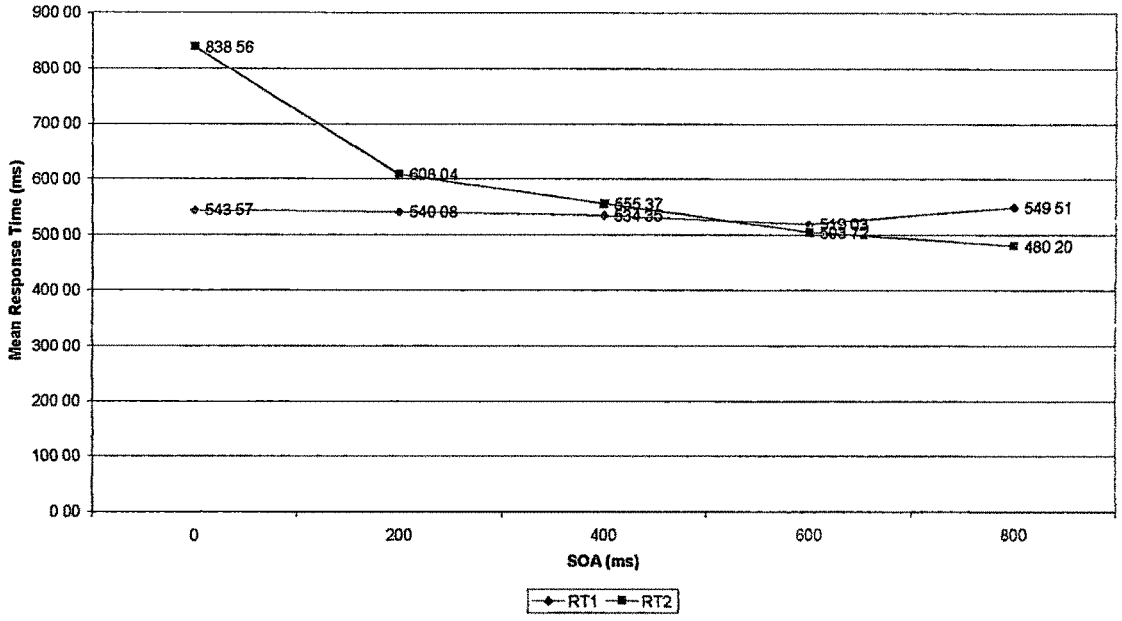
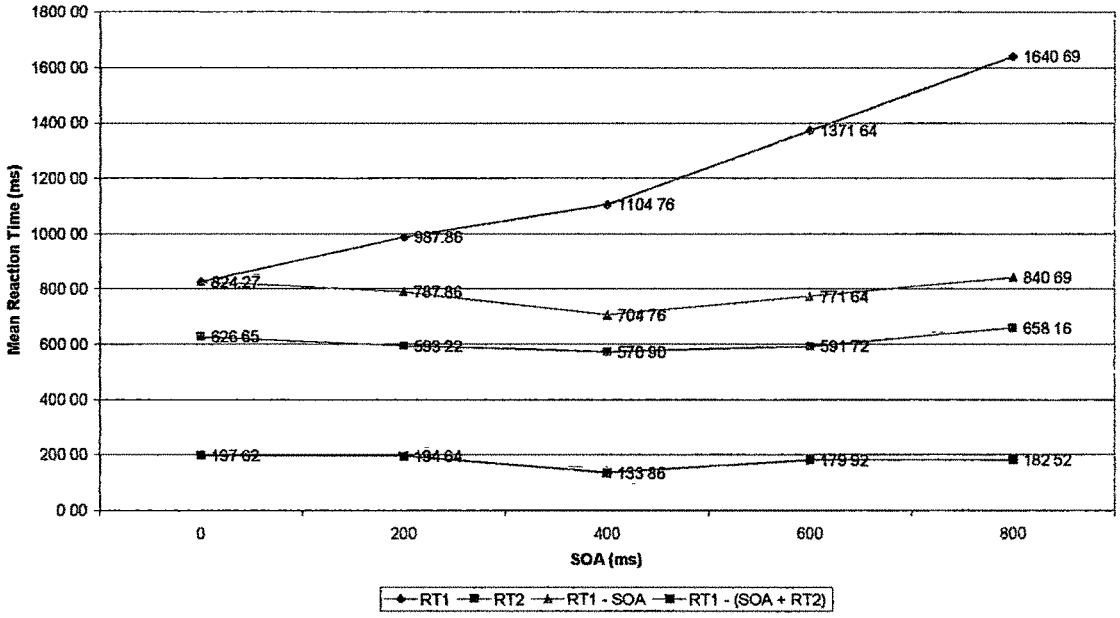


Chart 56 : Expt 5 Dual - Random - T2T1



response priority condition, overall pattern of scores remain more or less same, there is definite decrease in both RT1 and RT2. Whether this could be explained in terms of facilitation due to high motivation or due to practice effect is difficult to say at this stage. Thus, hypothesis 11 "PRP effect shall be different in subject decision priority task in comparison to standard PRP effect curve" is partially supported by the study. This is because, when response priority is T1T2 the PRP effect is not different from standard PRP effect, but when reponse priority is T2T1 PRP effect is different.

Although group PRP curves are similar to standard PRP effect, it is not necessary that each individual also has perfomed the task in the same manner. The individual curves may vary drastically from each other depending on what kind of task strategy each person has used. Differences in task strategy adopted by each subject may lead to two distinct type of effect, namely, magnitude effect and pattern effect. Magnitude effect would show up as increased or decreased mean RT. Pattern effect would show up as change in the curve of PRP effect. Besides, according to SRD model people may adopt any of the two task scheduling strategy - (1) Daring, (2) Cautious. Cautious people would generally produce parallel curves, whereas Daring people would produce divergent curves. Chart 57, Chart 58, and Chart 59 represents three selected individual PRP curves along with their stimulus specificity.

Darshini (Chart 57), and Kiran (Chart 58) are almost show a standard PRP curves with few variations in their magnitude for different stimuli. Interestingly both the subject seems to be changing their task strategy from cautious to daring at longer SOA. Aditi shows (Chart 59) PRP curve effect that is difficult to explain with standard explanation of SRD model. In fact, one of the objective of this research is to demonstrate that when individual cases are analyzed, interesting parameter estimation might be yielded in simulation studies of such empirical data. Aditi's curve would yield such parameter values which might be critical for evaluation of model fitness to reality.

Chart 57 : Expt 6 Dual - T1T2 : Darshini

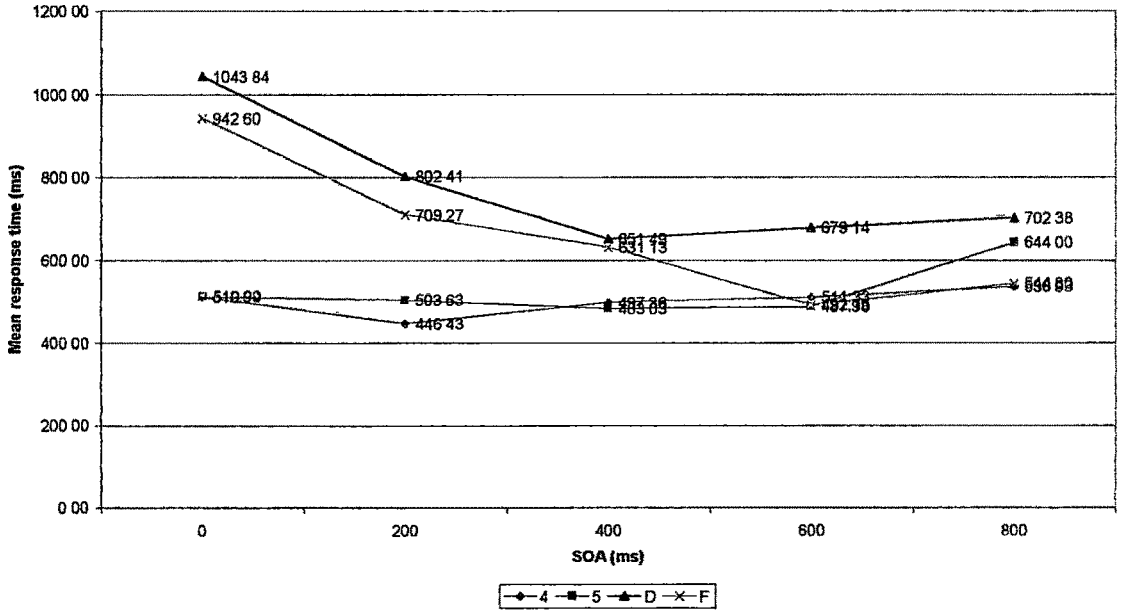


Chart 58 : Expt 5 Dual - T1T2 : Kıran

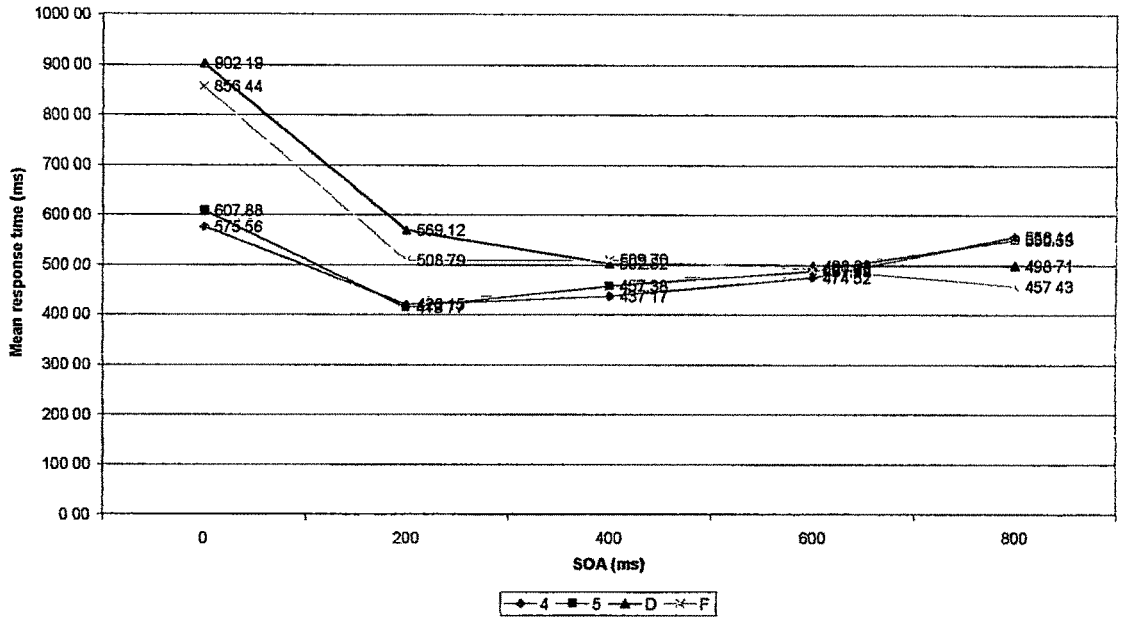


Chart 59 : Expt 5 Dual T1T2 : Aditi

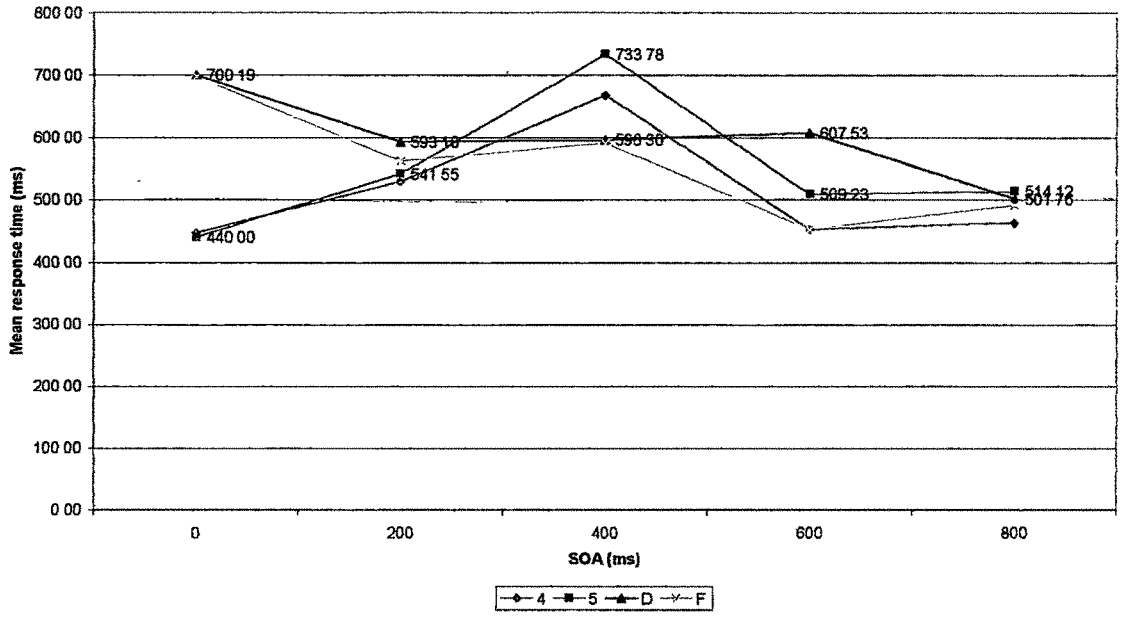


Chart 60 : Frequency distribution of response times - Dual task

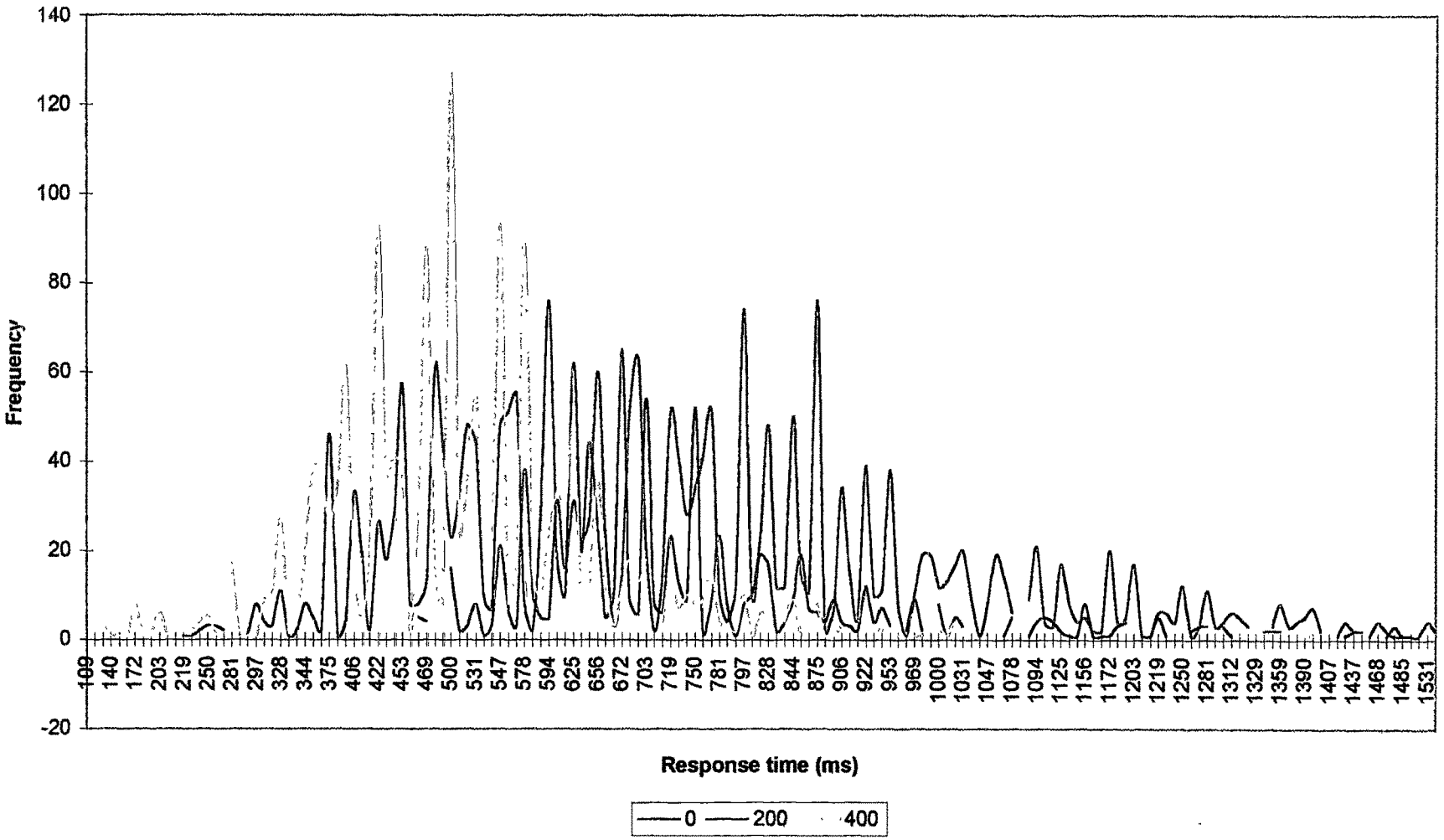


Chart 61 : Frequency distribution of response times - Dual task

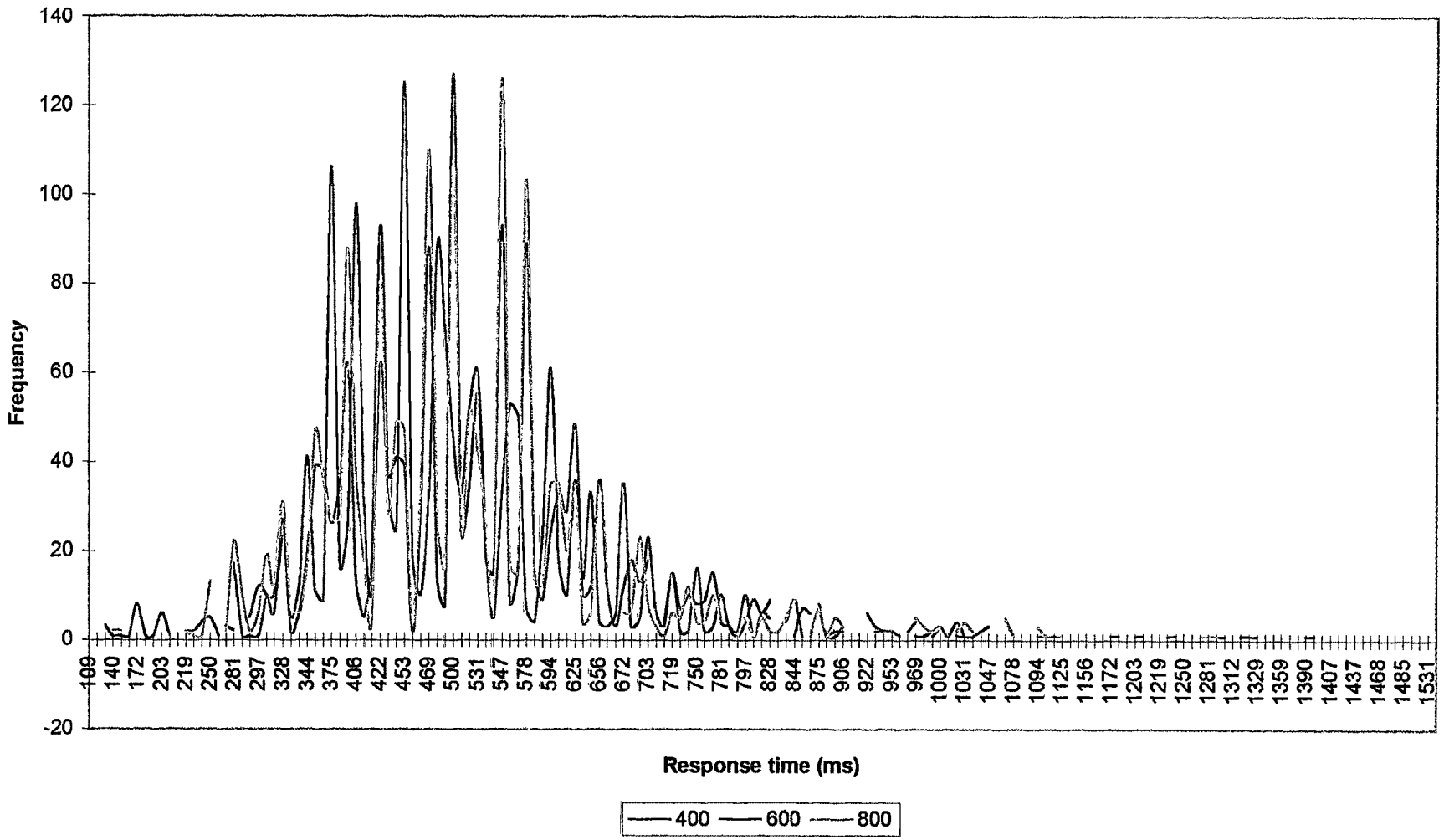


Chart 60 and Chart 61 shows frequency distribution of response times at 0-200-400 and 400-600-800 SOAs. Most intersting aspect of the frequency distribution is the overlapping response time under different SOA condition. This means, a specific response time X is occuring under different SOA condition. This is identical response time is emulated under different experimental conditions.

Besides, range of response times is 109-1532, spanning across 1424 numerical values. However, actual response times have occurred in 167 values only.

Conclusion :

Above tables and charts support following hypothesis

Hypothesis 9 : PRP effect in T1 priority task shall be as per the standard PRP effect curve.

Hypothesis 10 : PRP effect shall be different in T2 priority task in comparison to standard PRP effect curve.

Hypothesis 11 : PRP effect shall be different in subject decision priority task (random) in comparison to standard PRP effect curve.

Evidence for above hypotheses are based on fulfillment of the objective 1 " measurement of PRP effect when primary task is Task 1 and secondary task is Task 2, and Objective 2, that " measurement of PRP effect when primary task is Task 2 and secondary task is Task 1". Besides individual PRP curves also demonstrate PRP curve effects due to cautious and daring task strategies.

Experiment 5

Discrete Concurrent Choice Reaction Time - Tripple

The objectives of this experiment are "to explore PRP effect in tripple task environment" (Objective 3) under varying response priority, "to compare such PRP effect with Dual task PRP effect" (Objective 4) and "interpret tripple task PRP effect in EPIC based SRD model of PRP procedure" (Objective5).

Appropriate experimental conditions therefore hypothesize following with respect to this experiment.

Hypothesis 12 : There will be PRP effect in T1 also in tripple task trial whenever priority is not T1.

Hypothesis 13 : There will be PRP effect in T2 and T3 in tripple task trial and it will be significantly different from standard PRP effect curve.

Again, data analysis focuses more on visual representation of PRP effect under varying experimental conditions. Thus, data has been compiled and represented graphically and described with respect to objectives and hypotheses of the experiment. Six charts of PRP effect under T1T2T3, T1T3T2, T2T1T3, T2T3T1, T3T1T2 and T3T2T1 conditions are presented along with description.

Table 59 shows Reaction time of task 1, task 2 and task 3 in T1T2T3 response priority condition

	0	200	400	600	800
RT1	632.84	594.96	452.03	444.71	471.01
RT2	1038.11	776.87	531.31	494.72	497.78
RT3	1317.25	863.80	512.94	446.18	437.03

Table 59 shows reaction time 1 (RT1) of task 1 (T1), reaction time 2 (RT2) of task 2 (T2), and reaction time 3 (RT3) of task 3 (T3) at different SOAs for T1T2T3 task priority condition in discrete concurrent choice reaction time - tripple experiment. Chart 62 shows graphical representation of all three reaction time as a function of SOAs. The chart shows following characteristics of RT2 & RT3 :

1. Task 2 Reaction Time is higher at short SOA than at long SOA.

2. The slope of the PRP curve nearly equals -1 at short SOAs.

3. PRP effect at zero SOA is less that Task 1 RTs.

Above characteristics are similar to the theoretical PRP curve characteristics and empirically obtainted PRP curve characteristics. Thus, hypothesis 13 "There will be PRP effect in T2 and T3 in tripple task trial and it will be significantly different from standard PRP effect curve." is partially supported. This is because, PRP effect is not significantly different from standard PRP effect curve.

Chart 62 : Expt 5 Tripple : T1T2T3

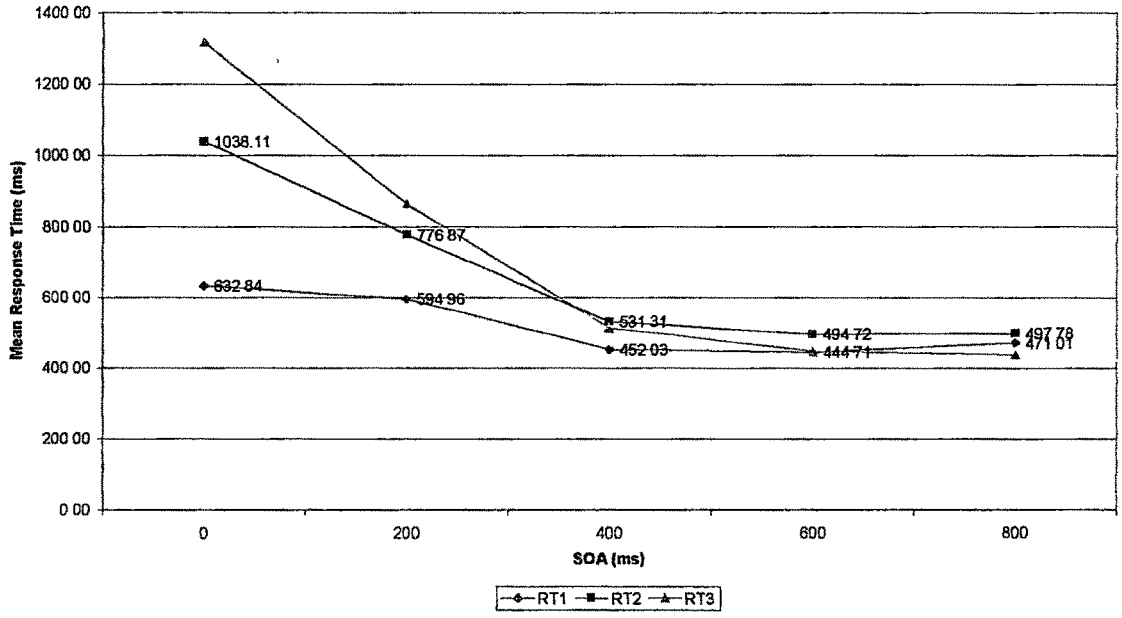


Table 60 shows Reaction time of task 1, task 2 and task 3 in T1T3T2 response priority condition

	0	200	400	600	800
RT1	692.04	779.10	505.64	477.97	532.54
RT3	920.18	871.65	676.32	602.00	597.49
RT2	1282.25	1430.89	1439.73	1576.36	1754.97
RT2 - SOA	1282.25	1230.89	1039.73	976.36	954.97
RT2 - (SOA + RT3)	362.07	359.24	363.41	374.35	357.49

Table 60 shows RT1, RT2 and RT3 under T1T3T2 task priority condition in discrete concurrent choice reaction time - tripple experiment. Table 60 shows RT2 after subtraction of SOA and also after subtraction of SOA + RT3 both. Chart 63 shows graphical representation of all three RTs as a function of SOAs.

All three RT curves show a slope upto short SOA (400 ms), which may be an indication of cautious strategy related PRP effect.

Although RT2 after subtraction of SOAs and RT3, is nearly similar to the Experiment 3 Simple reaction time - Single response time.

Chart 63 : Expt 5 Tripple - T1T3T2

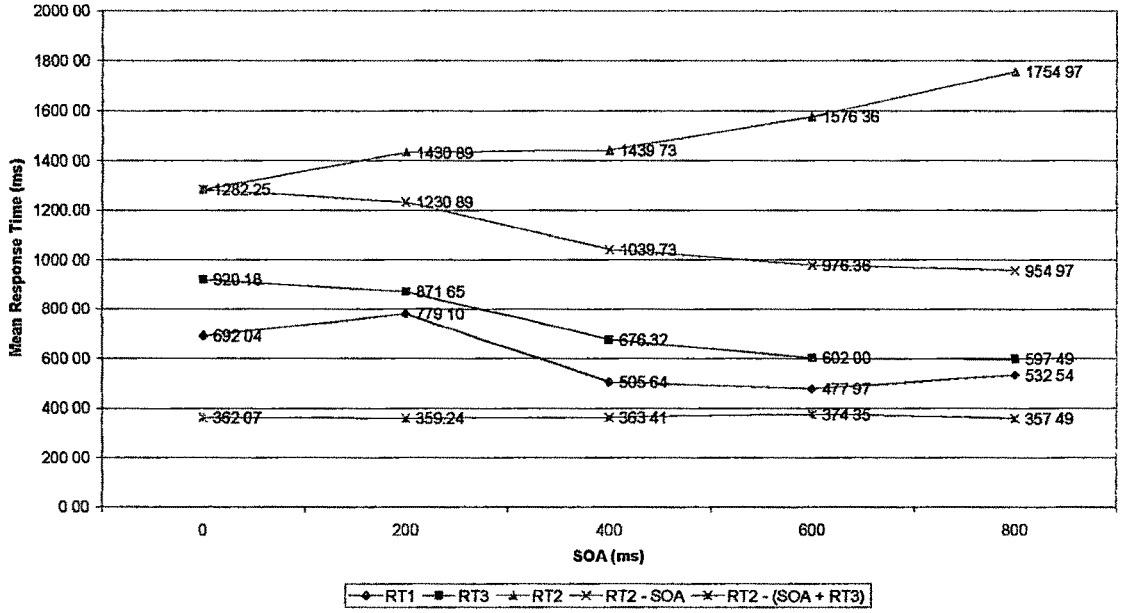


Table 61 shows Reaction time of task 1, task 2 and task 3 in T2T1T3 response priority condition

	0	200	400	600	800
RT2	674.10	855.86	686.63	625.62	637.01
RT1	1108.60	1434.76	1476.75	1710.14	2052.36
RT3	1301.53	1222.85	868.68	740.30	716.90
RT1 - SOA	1108.60	1234.76	1076.75	1110.14	1252.36
RT1 - (SOA + RT2)	434.50	378.90	390.11	484.52	615.35

Table 61 shows RT1, RT2 and RT3 under T2T1T3 task priority condition in discrete concurrent choice reaction time - tripple experiment. Table 61 shows RT1 after subtraction of SOA and also after subtraction of SOA + RT2 both. Chart 64 below shows graphical representation of all three RTs as a function of SOAs.

RT3 has shown typical characteristics of PRP curve, whereas RT2 and RT1 has shown PRP effect at 200 and 400 SOA and obviously no PRP effect at 0 SOA.

Chart 64 : Expt 5 Tripple - T2T1T3

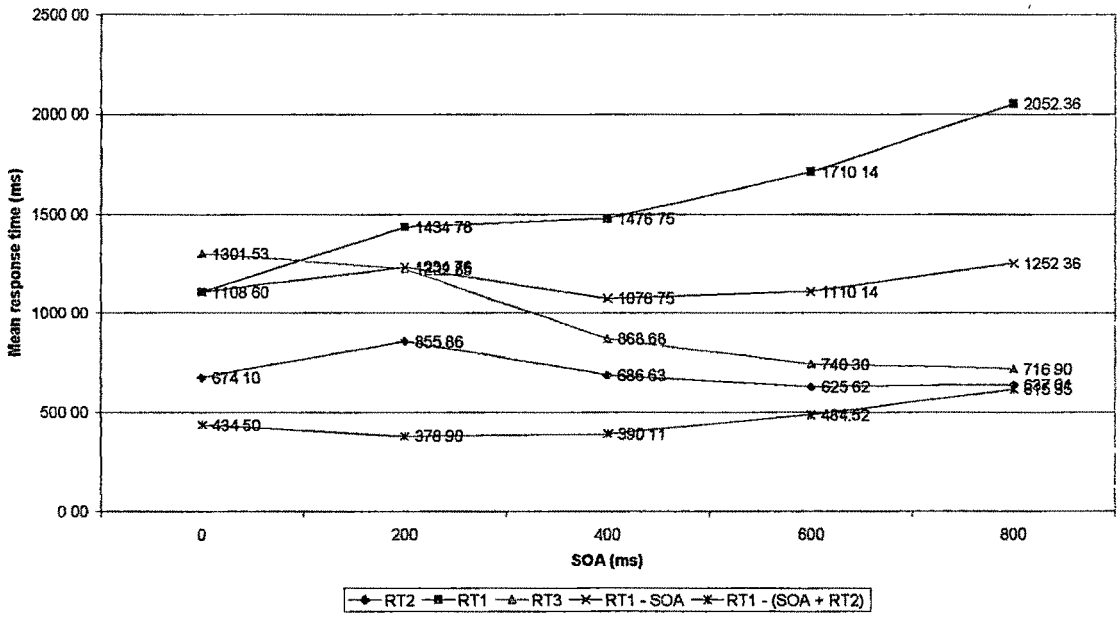


Table 62 shows Reaction time of task 1, task 2 and task 3 in T2T3T1 response priority condition

	0	200	400	600	800
RT2	636.47	723.94	622.21	589.73	573.63
RT3	997.83	935.19	702.79	662.56	622.14
RT1	1190.07	1532.20	1706.66	2085.93	2463.46
RT1 - 2(SOA)	1190.07	1132.20	906.66	885.93	863.46
R1 - (2*SOA + R3)	192.24	197.01	203.87	223.37	241.32

Table 62 shows RT1, RT2 and RT3 under T2T3T1 task priority condition in discrete concurrent choice reaction time - tripple experiment. Table 62 shows RT1 after subtraction of 2SOA and also after subtraction of 2SOA + RT3 both. Chart 65 below shows graphical representation of all three RTS as a function of SOAs.

RT3 has shown typical characteristics of PRP curve, whereas RT1 also has shown some degree of PRP effect after subtraction of 2SOA.

Chart 65 : Expt 5 Tripple - T2T3T1

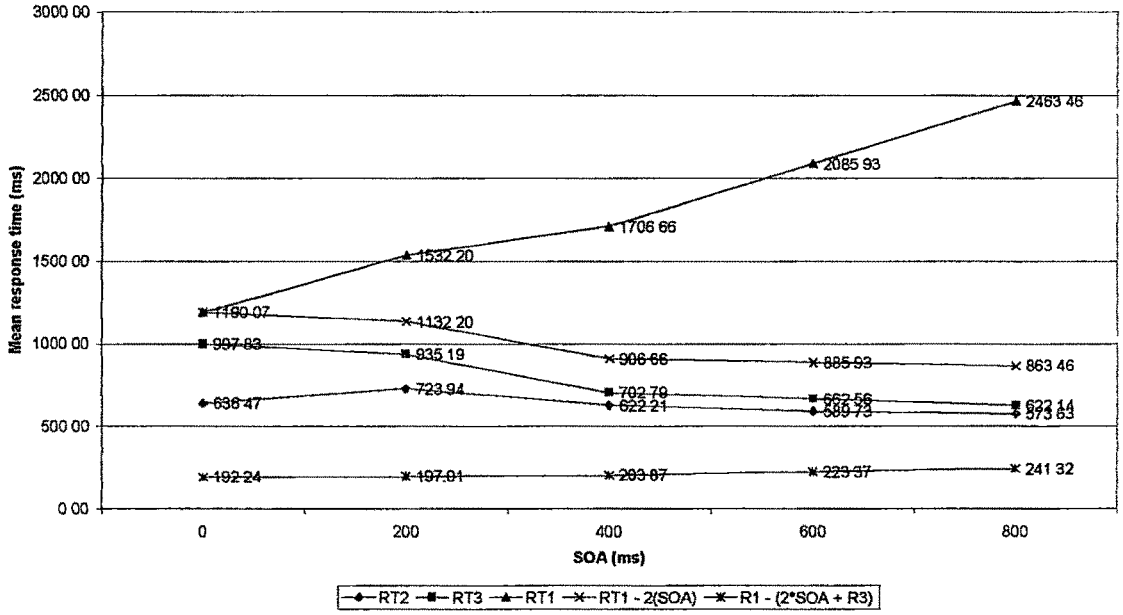


Table 63-1 shows Reaction time of task 1, task 2 and task 3 in T3T1T2 response priority condition

	0	200	400	600	800
RT3	623.48	670.71	589.39	618.36	650.17
RT1	818.91	1283.78	1597.32	2033.11	2495.07
RT2	1134.87	1369.24	1477.94	1719.05	1995.10
RT1 - 2SOA	818.91	883.78	797.32	833.11	895.07
RT1 - (2SOA + RT3)	195.43	213.07	207.94	214.75	244.90
RT2 - SOA	1134.87	1169.24	1077.94	1119.05	1195.10
RT2 - (SOA + RT3 + (RT1 - (2SOA + RT3)))	315.96	285.46	280.62	285.95	300.03

Table 63-1 shows RT1, RT2 and RT3 under T3T1T2 task priority condition in discrete concurrent choice reaction time - tripple experiment. Table 63 shows RT1 after subtraction of 2SOA and also after subtraction of 2SOA + RT3 both. It also shows RT2 after subtraction of SOA and also after subtraction of final RT1. Chart 66 below shows graphical representation of all three RTS as a function of SOAs.

No RT curve is shown any typical characteristic of PRP curve and thus no PRP effect is observed in this data. This is expected as all three task in fact becomes three sequential task because of task conditions.

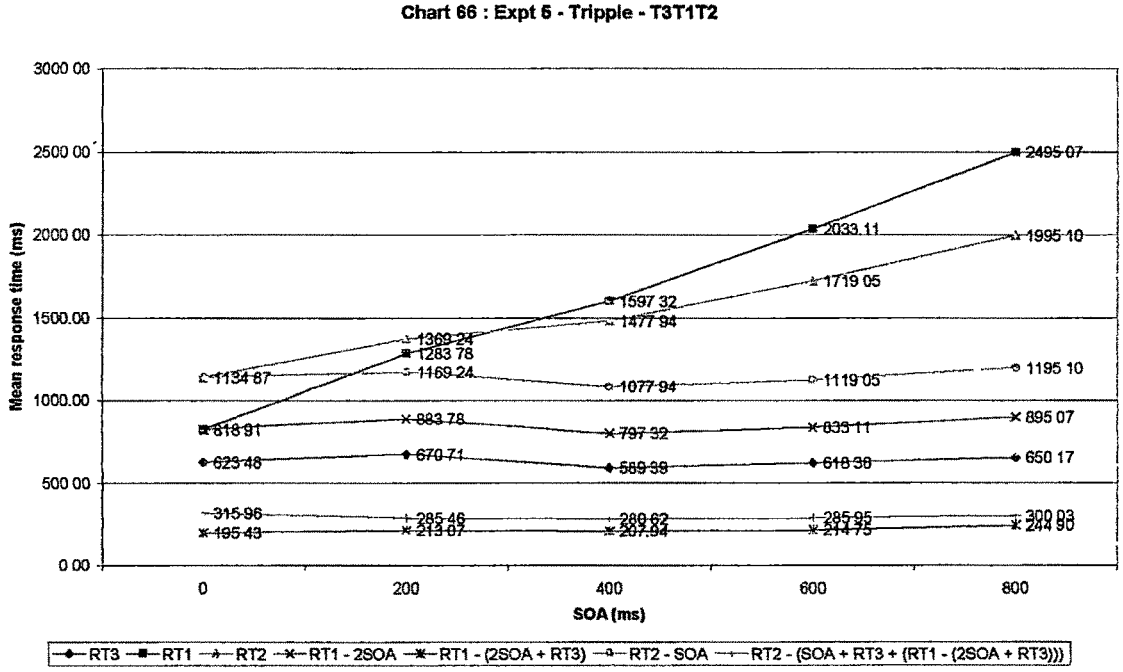


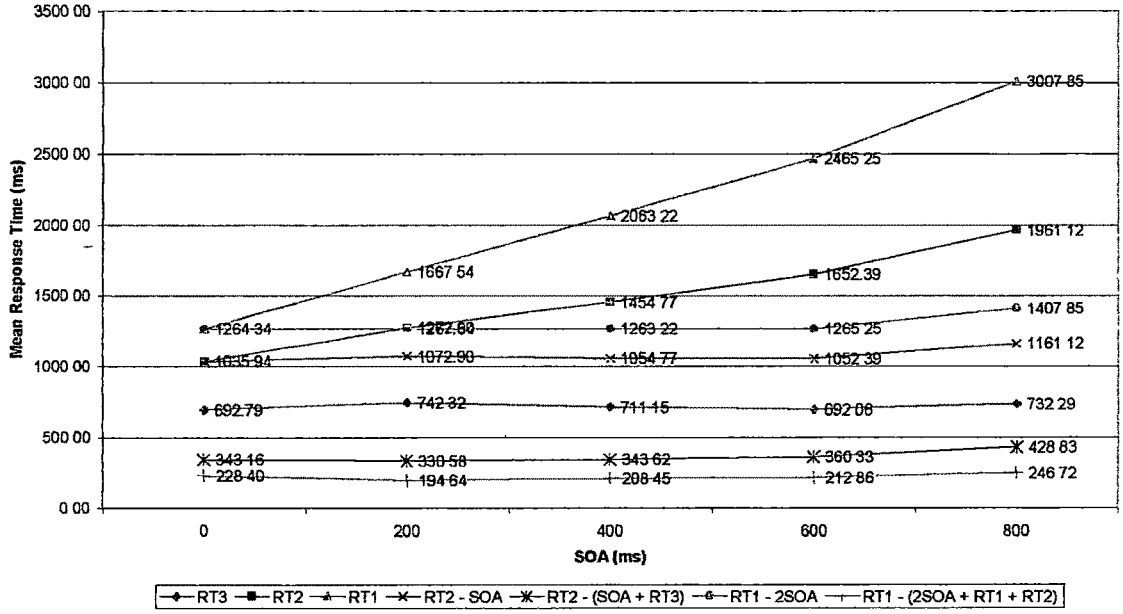
Table 63-2 shows Reaction time of task 1, task 2 and task 3 in T3T1T2 response priority condition

	0	200	400	600	800
RT3	692.79	742.32	711.15	692.06	732.29
RT2	1035.94	1272.90	1454.77	1652.39	1961.12
RT1	1264.34	1667.54	2063.22	2465.25	3007.85
RT2 - SOA	1035.94	1072.90	1054.77	1052.39	1161.12
RT2 - (SOA + RT3)	343.16	330.58	343.62	360.33	428.83
RT1 - 2SOA	1264.34	1267.54	1263.22	1265.25	1407.85
RT1 - (2SOA + RT3 + RT2)	228.40	194.64	208.45	212.86	246.72

Table 63-2 shows RT1, RT2 and RT3 under T3T1T2 task priority condition in discrete concurrent choice reaction time - tripple experiment. Table 63 shows RT1 after subtraction of 2SOA and also after subtraction of 2SOA and final RT3 as well as RT1 both. It also shows RT2 after subtraction of SOA and also after subtraction of SOA and final RT3. Chart 67 below shows graphical representation of all three RTS as a function of SOAs.

No RT curve is shown any typical characteristic of PRP curve and thus no PRP effect is observed in this data. This is expected as all three task in fact becomes three sequential task because of task conditions.

Chart 67 : Expt 5 Tripple - T3T2T1



Conclusion :

Thus, above data and charts clearly indicates that PRP effect is observed in T1T2T3, T1T3T2, T2T1T3 and T2T3T1 conditions and no PRP effect is observed in T3T1T2 and T3T2T1 conditions. Thus, both hypotheses 12 "There will be PRP effect in T1 also in tripple task trial whenever priority is not T1" and hypothesis 13 "There will be PRP effect in T2 and T3 in tripple task trial and it will be significantly different from standard PRP effect curve." are partially supported.

The objectives of this experiment were "to explore PRP effect in tripple task environment" (Objective 3) under varying response priority, "to compare such PRP effect with Dual task PRP effect" (Objective 4) and "interpret tripple task PRP effect in EPIC based SRD model of PRP procedure" (Objective5). Further discussion of relevance of these findings with EPIC based SRD model follows in General Discussion.

Experiment 6

Matched Figure Test

EPIC based SRD model assumes that task strategies used by subject is the major determinant of multiple-task performance. Obviously task strategies adopted shall be dependent on the history of an individual. The best reflection of such a history is the cognitive and affective style of an individual. Matched figure test helps identify reflective-impulsive style of affection. It was presumed that since affective style influences processing of information and it should influence in turn task strategies adopted by subjects. Therefore objective of this experiment is to identify affective style of subjects and to explore their Dual Task and Triple Task performance.

In order to attain objective, the participant performance on Matched Figure Test was analyzed to identify their style. Overall time to perform the test and response accuracy were considered criteria to form two groups of polar styles. Median split was the criteria for grouping the individuals. Subsequently, subjects were coded for their style and their PRP curves were plotted to explore any difference in their performance.

Table 64 shows mean test time and number of errors and the group assigned to each subject

	Errors	Mean	Group
Kiran	0	3521.35	Reflective
Rohit	0	5445.83	Reflective
Ragam	1	4217.68	Reflective
Veena	1	4260.35	Reflective
Minal	1	4948.18	Reflective
Shruti M	1	5623.40	Reflective
Nidhi	2	5525.30	Reflective
Sumit	2	5839.52	Reflective
Yogesh	2	6847.10	Reflective
Sangeeta	3	3347.75	Reflective
Hamza Ali	3	3809.53	Impulsive
Shruti S	3	4708.07	Impulsive
Apurva	3	4873.33	Impulsive
Keyoor	4	4336.78	Impulsive
Darshini	4	5681.80	Impulsive
Soham	5	4424.97	Impulsive
Shweta	5	5521.00	Impulsive
Ruta	6	4690.07	Impulsive
Aditi	7	3159.78	Impulsive
Sameena	9	3937.25	Impulsive

Table 64 shows number of errors, and mean response time of each subject. The data was ordered on errors and mean value. First 10 subjects were assigned reflective style as they had made less errors, whereas subjects with more errors (last 10) were assigned impulsive style as they have made more errors.

Table 65 shows one-way ANOVA of reflective and impulsive group

RTIME	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	58977964.24	1	58977964.24	4.23	0.04
Within Groups	16705067482	1198	13944129.78		
Total	16764045446	1199			

Table 65 shows results of one-way ANOVA between reflective and impulsive group. The F ratio is significant at 0.05 level. Thus, there is significant difference between performance of reflective and impulsive group on Matched Figure Test.

Table 66 shows mean and SD of reflective and impulsive group

AFFSTYLE	Mean	Std. Deviation	Mean Difference
Impulsive	4514.26	3421.46	443.39
Reflective	4957.65	4022.67	
Total	4735.95	3739.21	

Table 66 shows mean, SD and mean difference between reflective and impulsive group. As expected, Impulsive group is significantly faster than Reflective group in performing Matched Figure Test.

Table 67 shows reaction time of task 1 and task 2 in T1T2 response priority condition for both impulsive and reflective group

		0	200	400	600	800
Impulsive	RT1	494.62	480.02	480.83	504.06	542.42
	RT2	835.90	621.40	542.94	528.09	544.81
Reflective	RT1	551.71	522.97	471.30	514.96	558.69
	RT2	852.13	641.87	509.73	507.97	494.82

Table 67 shows reaction time 1 (RT1) of task 1 (T1) and reaction time 2 (RT2) of task 2 (T2) at different SOAs for Impulsive and Reflective group based on Matched Figure Test. Chart 68 shows graphical representation of both reaction time as a function of SOAs. Since both group have shown similar pattern of response times for both RTs, it can be concluded that Impulsive and Reflective group do not differ on PRP effect of their multiple-task performance in Dual Task - T1T2 condition.

Chart 68 : Expt 5 Dual task - T1T2

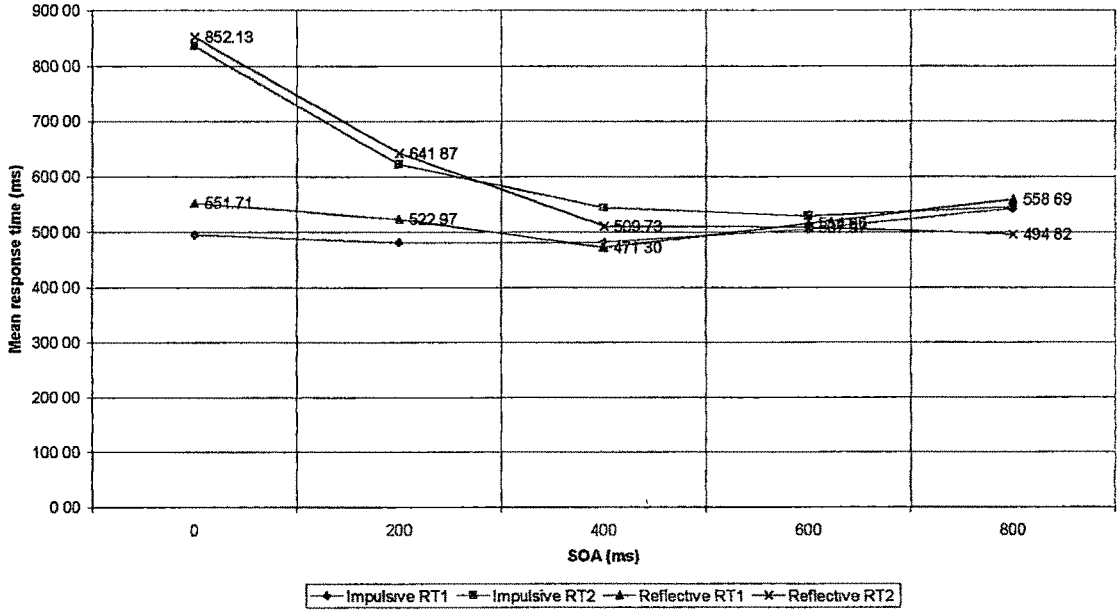


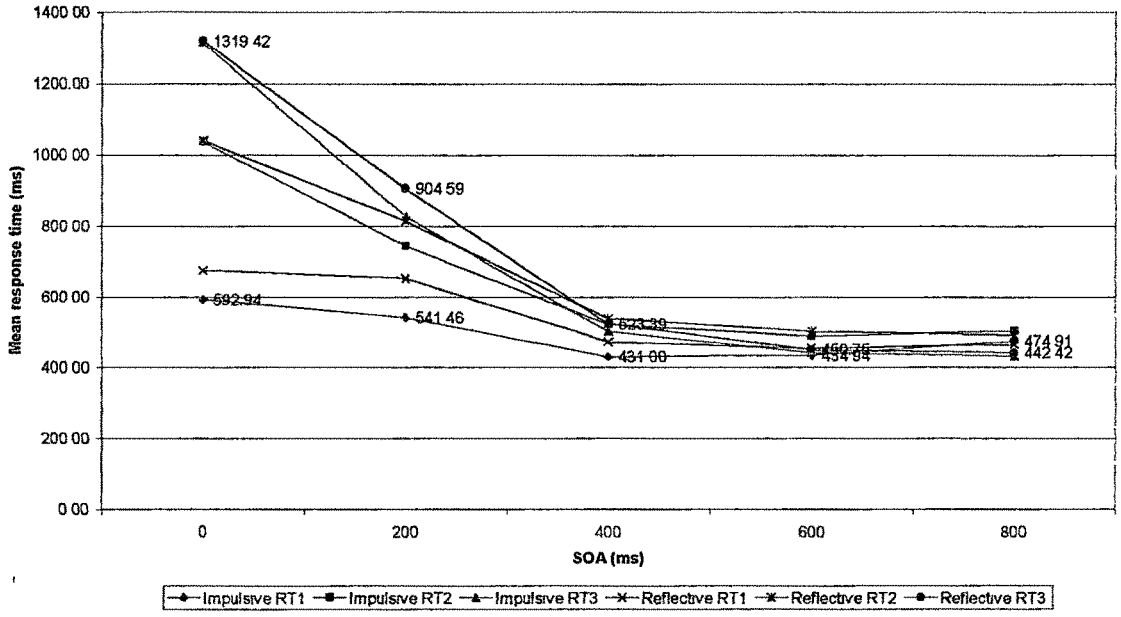
Table 68 shows reaction time of task 1, task 2 and task 3 in T1T2T3 response priority condition for impulsive and reflective group

		0	200	400	600	800
Impulsive	RT1	592.94	541.46	431.00	434.94	474.91
	RT2	1036.17	743.19	522.60	487.21	503.61
	RT3	1315.19	825.82	502.21	441.99	431.75
Reflective	RT1	675.03	652.40	472.54	455.32	467.02
	RT2	1040.16	813.03	539.79	502.88	491.82
	RT3	1319.42	904.59	523.39	450.75	442.42

Table 68 shows reaction time 1 (RT1) of task 1 (T1), reaction time 2 (RT2) of task 2 (T2), and reaction time 3 (RT3) of task 3 (T3) at different SOAs for Impulsive and Reflective groups as identified by Matched Figures Test. Chart 69 shows graphical representation of all three reaction time as a function of SOAs.

As the chart shows there are distinct magnitude differences PRP effect curve of Impulsive and Reflective Group. Thus, two groups differ on PRP effect in multiple-task peformance. On basis of these data on T1T2 and T1T2T3 task conditions a hypothesis could be proposed that there might be significant differences between Impulsive and Reflective group on PRP effect in multiple-task performance.

Chart 69 : Expt 5 Tripple : T1T2T3



Experiment 7

Embeded Figure Test

EPIC based SRD model assumes that task strategies used by subject is the major determinant of multiple-task performance. Obviously task strategies adopted shall be dependent on the history of an individual. The best reflection of such a history is the cognitive and affective style of an individual. Embeded figure test helps identify Field dependent - Field Independent style of cognition. It was presumed that since cognitive style influences processing of information and it should influence in turn task strategies adopted by subjects. Therefore objective of this experiment is to identify cognitive style of subjects and to explore their Dual Task and Tripple Task performance.

In order to attain objective, the participant performance on Embeded Figure Test was analyzed to identify their style. Overall time to perform the test and response accuracy were considered criteria to form two groups of polar styles. Median split was the criteria for grouping the individuals. Subsequently, subjects were coded for their style and their PRP curves were plotted to explore any difference in their performance.

Table 69 shows mean test time and number of errors and the group assigned to each subject

	Errors	Mean	Group
Soham	15	38148.43	Field Dependent
Shweta	23	24052.73	Field Dependent
Darshini	15	23020.41	Field Dependent
Nidhi	18	22006.17	Field Dependent
Sumit	21	21899.13	Field Dependent
Keyoor	5	21057.83	Field Dependent
Ragam	9	19716.77	Field Dependent
Veena	10	18648.98	Field Dependent
Minal	16	18097.88	Field Dependent
Rohit	32	16787.83	Field Dependent
Hamza	13	16647.64	Field Independent
Shruti S	16	14474.61	Field Independent
Shruti M	28	14271.20	Field Independent
Kiran	9	13855.22	Field Independent
Yogesh	21	13773.45	Field Independent
Sangeeta	15	12469.50	Field Independent
Apurva	33	10912.31	Field Independent
Aditi	21	9027.55	Field Independent
Ruta	34	8535.41	Field Independent
Sameena	28	7908.38	Field Independent

Table 69 shows number of errors, and mean response time of each subject. The data was ordered on errors and mean value. First 10 subjects were assigned Field Dependent style as they had made more errors and more response time, whereas subjects remaining 10 subjects with less errors and less response time were assigned Field Indepedent style.

Table 70 shows one-way ANOVA of Field Dependent and Field Independent Group

RTIME	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	32262372853.82	1	32262372853.82	91.72	0.00
Within Groups	448130406782.47	1274	351750711.76		
Total	480392779636.29	1275			

Table 70 shows results of one-way ANOVA between Field Dependent and Field Independent group. The F ratio is significant at 0.000 level. Thus, there is significant difference between performance of Field Dependent and Field Independent group on Embeded Figure Test.

Table 71 shows mean and SD of Field Dependent and Field Independent Group

GROUP	Mean	Std. Deviation	Mean Difference
Field Dependent	22244.21	24938.51	10056.69
Field Independent	12187.53	9124.87	
Total	17200.11	19410.79	

Table 71 shows mean, SD and mean difference between Field Dependent and Field Independent Group. As expected, Field Dependent group is significantly higher in response time and has much variability than Field Independent Group in performing Embeded Figure Test.

Table 72 shows Reaction time of task 1 and task 2 in T1T2 response priority condition for both Field Dependent and Field Independent Group

		0	200	400	600	800
Field Dependent	RT1	513.70	486.58	453.49	487.02	541.47
	RT2	838.93	618.08	508.07	495.72	498.66
Field Independent	RT1	536.09	516.95	497.57	530.19	560.55
	RT2	850.10	645.24	542.43	538.52	539.86

Table 72 shows reaction time 1 (RT1) of task 1 (T1) and reaction time 2 (RT2) of task 2 (T2) at different SOAs for Field Dependent and Field Independent group based on Embeded Figure Test. Chart 70 shows graphical representation of both reaction time as a function of SOAs. Since both group have shown similar pattern of response times for both RTs, it can be concluded that Field Dependent and Field Independent group do not differ on PRP effect of their multiple-task performance in Dual Task - T1T2 condition.

Chart 70 : Expt 5 Dual Task - T1T2

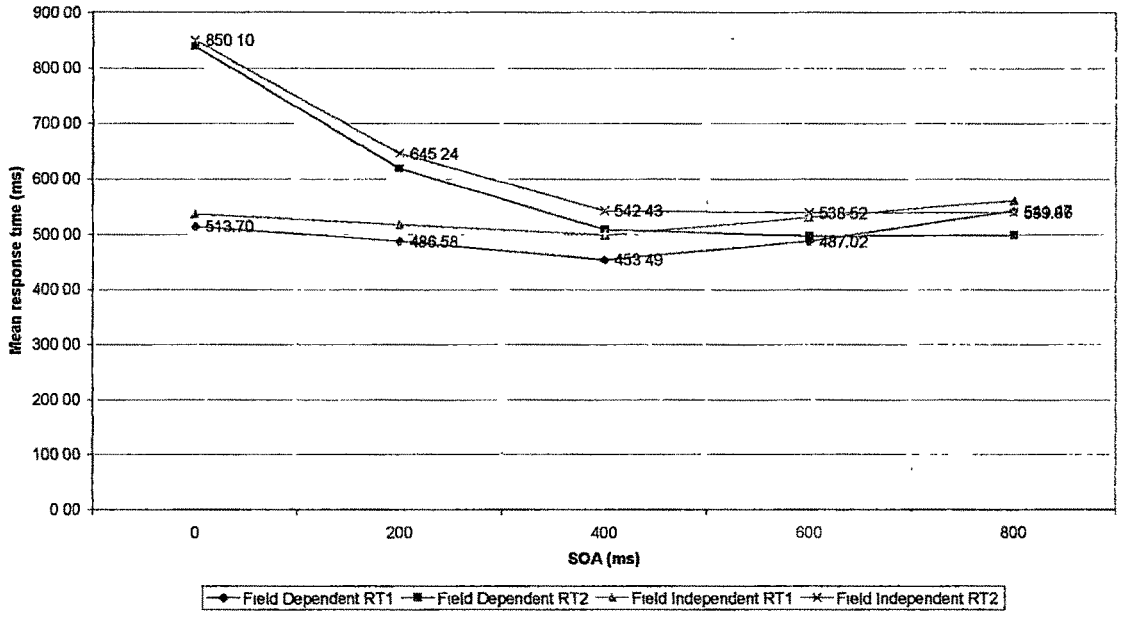


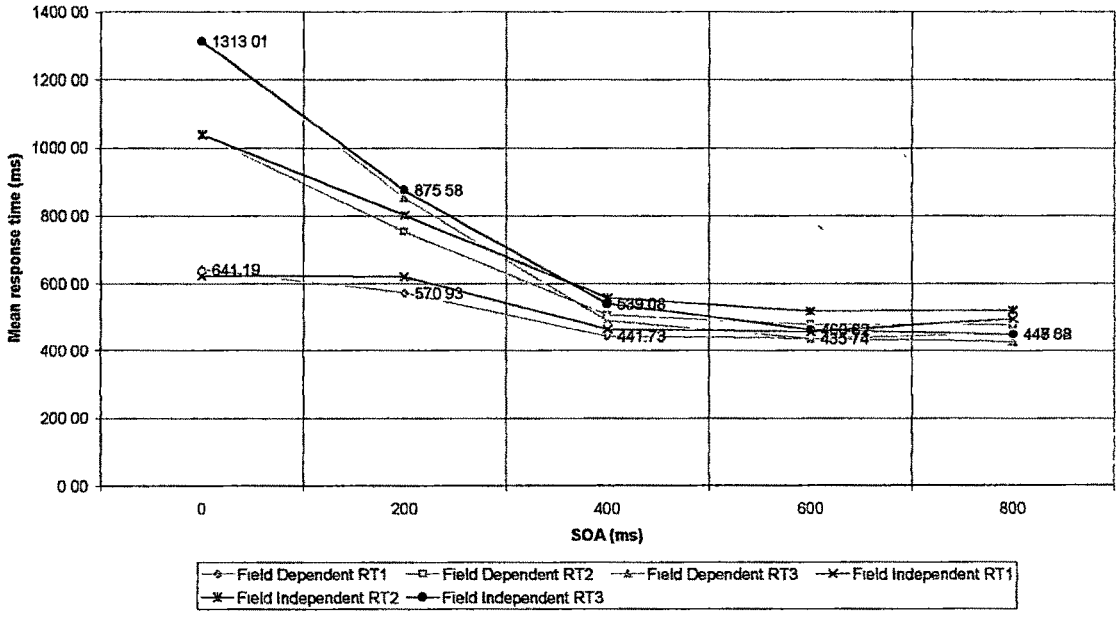
Table 73 shows Reaction time of task 1, task 2 and task 3 in T1T2T3 response priority condition for Field Dependent and Field Independent Group

		0	200	400	600	800
Field Dependent	RT1	641.19	570.93	441.73	435.74	448.32
	RT2	1038.26	753.90	506.28	476.15	475.31
	RT3	1320.91	852.60	488.60	433.93	426.55
Field Independent	RT1	623.18	620.23	463.10	455.28	494.09
	RT2	1037.94	801.02	558.19	516.61	520.63
	RT3	1313.01	875.58	539.08	460.62	447.68

Table 73 shows reaction time 1 (RT1) of task 1 (T1), reaction time 2 (RT2) of task 2 (T2), and reaction time 3 (RT3) of task 3 (T3) at different SOAs for Field Dependent and Field Independent groups as identified by Embeded Figures Test. Chart 71 shows graphical representation of all three reaction time as a function of SOAs.

As the chart shows, there are distinct differences in PRP effect of Field Dependent and Field Independent Group. Thus, two groups do not differ on PRP effect in multiple-task peformance. On basis of these data on T1T2 and T1T2T3 task conditions, it can be concluded that Field Dependent and Field Independence do not influence the PRP effect in multiple-task performance.

Chart 71 : Expt 6 Tripple - T1T2T3



GENERAL DISCUSSION

Aim of this research was to explore cognitive-affective processes in multiple-task performance through empirical evidence for Executive Process Interactive Control (EPIC) based Strategic Response Deferement (SRD) model of Psychological Refractory Period procedures under varied experimental set-up. In all, seven experiments were conducted to explore several cognitive-affective processes in relevant task situations. Obviously evaluation of any theoretical framework such as EPIC, and especially any model, such as SRD, which is supposed to account for human behaviour would raise philosophical, conceptual, methodological, empirical and even ethical questions. Ethical questions are not relevant here, remaining ones certainly are. Before discussing the relevant issues in the context of present research, a brief note about modeling will facilitate comprehension of the same.

As Myung and Pitt (2002) state "the goal of modeling in psychology is to infer the regularity present in the given data while at the same time assessing the veridicality of the hypthesized model". Generally model construction follows steps such as (1) identification of regularity in data, (2) infering underlying processes for the same, (3) preparation of simulation, (3) estimate parameters of the model and simulate results on the basis of parameters, (4) comparison of simulated and empirical results, (5) estimating the goodness of fit and finally (6) generalizing the model to fit future data also. SRD model, which is the context of current research, framed under EPIC theoretical framework has already pass through first five stages and the sixth one is in progress. In the context of efforts to generalize the model, present research has relevance.

Several studies of PRP effects have identified S-R difficulty, S-R compatibility, S-R numerosity, Decision types involved, Response repititions, Response conflict, Sensory modality, Motor modality, Stimulus onset asynchrony, Response priority and strategies used by subject as the important variables influencing the outcome of such studies. Experiment one has highlighted consideration of stimulus difficulty in terms of its absolute and relative featural constraints. Though, empirical studies do consider S-R difficulty as a variable, most of the studies deal with this issue as easy task or hard task and thus specify to two graded task conditions. The point made here is that in an experiment which uses visual presentation of a letter or number as stimulus, extra caution should be exercized in selection of the letter or number. Each letter or number involves number of features in its identification and hence, requires different time in its

identification. Thus, decision task of identification of each letter or number has its own probability distribution. Such variations would certainly constrain the parameter estimation of any model describing underlying behaviour. Two parameters of SRD model, namely, stimulus detection time and stimulus identification time will be influenced by such variation, especially when SOAs are less than 100 ms. This is well demonstrated in terms of correct and false identification of stimuli under various display time conditions.

Generally, PRP studies use choice reaction task for both Task 1 and Task 2 in most of the experimental conditions. Such choice reaction tasks require two or more stimulus. Thus, for a subject, decision task is to identify one of the two or more stimuli. In such a decision, criteria for detection and identification are constrained by relative featural difficulty of each letter or number instead of absolute featural difficulty. It is the combination of letter or number that have been selected that determines the difficulty of the decision task. It can be said that absolute featural difficulty of two or more letters or numbers would produce an interaction effect in such a task. Thus, stimulus identification time of SRD model will be constrained by which two letters or numbers have been selected, again especially at SOAs shorter than 100 ms as demonstrated by Experiment one.

In SRD model movement production time has been considered as stochastic parameter and its mean value is assumed to be 150 ms. When simple motor response, such as key press is implemented, it takes a range of value as demonstrated by Experiment 2. Interestingly, the range is generally large and there are quite a number of numerical values possible within the range. These values may be assumed as a set of consisting of all possible values that movement production parameter can be assigned in simulation. However, as results of Experiment 2 suggests, only limited number of values are realized in actual implementation of a response. Thus, response process is constrained by a number of internal factors. Unless, SRD model simulates movement production with the same set of values, the parameter estimation by model may be misrepresentative of actual response process.

In both Experiment 1 and 2, stimulus and response process has emerged as important factor to be considered in parameter estimation of SRD model. One more important factor which has emerged in both experiment is the individual differences. In fact, each individual has his own set of values in each experiment. SRD model estimates parameters on the basis of mean values and each subject has generally his own mean values in stimulus identification and response process. Thus, ideally in a simulation

study parameter estimation should be constrained by individual differences also. This is possible only if current methods (standard PRP experiment) of empirical studies is changed.

Currently, multiple-task studies generally create a choice task situation and varies other important factors such as SOA, stimulus difficuly, stimulus compatibility etc. However, a choice task situation is essentially a composite of two simple reaction task, which in turn is a composite of stimulus identification task and response task. Obviously, each such task level when studied separately yields its own pattern of responses. As Experiment 2, 3 and 4 have demonstrated there are distinct mean values of performance under each task level. However, distribution of responses under each task level is not so distinct. When response distributions are plotted on the same axis we find that they overlap as seen in combined frequency distribution of Experiment 3 and 4. Generally overlap occurs in left and middle region whereas right end extends without overlap.

Thus, although mean values of different response distributions of hierarchic task levels may be distinctly different, the actual instantiation of each response might overlap at different task levels. In fact, there are three possibilities for each instance of response -

1. A distinct instance of response not overlapping on any of the lower task level

2. An overlapping instance of response overlapping on immediately lower task level

3. An overlapping instance of response overlapping on all lower task level

All responses of third possibility, as mentioned above, would be a set of response times which would occur in task levels with varying demands on cognitive and motor processes. When mean value of such instances are simulated under different task level, they would yield different parameter estimation appropriate to such task level. However, if they are compared across task level, they would be constrained by each other and could help in generalizing the model across task level. Thus, current method of studying PRP effect should adopt hierarchical method of experimentation rather than single or at the two task level experimentations.

Individual differences have emerged as an important factor in variation of responses in the present study. Thus, such experimentation should have a mixed design - combination of single-subject design, within-subject design and between-subject design

as it is done in this research. Data based on individual differences could effectively inform practical use of multiple-task performance in selection, training and evaluation.

Experiment 5 Dual was done to verify whether current research findings have similarity with the standard PRP curve effect. The results have demonstrated the same. However, when similar task environment was repeated in tripple task situation, PRP effect was observed there also. Thus, rather than studying dual task situation, tripple task situation could also be studied. There are several advantages of tripple task situation -

1. Tripple task situations offers six different possibility of response priority in comparison to dual task situations;

2. Tripple task situation offers possibility of double variation in SOA

3. Tripple task situation offers more possibility of task combinations

4. Many real life situations are more like tripple task performance rather than dual task performance e.g., control room work, computer game playing etc.

5. Even if third task is repeated in a tripple task situation, theorisation of such a task situation would facilitate understanding of dual task performance. Because, in day-to-day living, people generally are inerfered with their current task, they perform the interfering task and resume the current task. Thus, tripple task situation can easily simulate such task situation.

6. Semantically, tripple task performance is truly a multiple-task performance and not the dual task performance.

SRD model assumes that multiple-task performance is characterized by task and the strategies used in performing the same. Obviously, use of strategy in such task situation influenced by the history of the person - in terms of practice, learning, fatigue, adaptability etc. One of the important determinant emerging from such history is the style of the person. Experiment 6 and 7 explored the possibility of influence of cognitive and affective style on multiple-task performance. Although findings are not distinctly indicative, there is a possibility of influence of cognitive and affective style on PRP effect. Even magnitude differences as found in Experiment 6 would require either changes in parameter estimation or in executive processes.

SRD model simulation values for the stochastic parameters were sampled from uniform distribution whose coefficient of variation (i.e. the ratio of the standard deviation to the mean) equaled 0.2. This was consistent with typical relation between empirical RT means and standard deviations. However data analysis of Experiment 3 and 4 have indicated that V does not remain 0.2 always, especially when individual differences and switching tasks are considered.

To summarize, the findings of current research are in tune with empirical studies reported in scientific literature. EPIC based SRD model is a computational model which explains general regularity or pattern in empirical studies of PRP effect. When findings of current research are compared with SRD model implementation, important suggestions have emerged which should be taken care of in generalizing the SRD model with future data.