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RORSCHACH PERFORMANCE UNDER RAVONA DOSAGE*

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Introduction

Recently, with the considerable development of the new psychoactive drugs, many studies have come to be carried out on the effects of drugs upon the human behavior (1) (9).

Such movement seems to be important not only in the field of pharmacopsychology, but also for the personality diagnosis in the clinical psychology and the psychiatry. Because it has been reported that the use of prenarcotic dosage such as Sodium Amytal, decreasing the patients' psychic tension, reducing his suppression and repression and facilitating good rapport, made a desirable effect on the interview and therapy, especially, for defensive patients. Among such reports, one of the great interests is the study on thes effect of drugs upon Rorschach performance, which has already been demonstrated under normanl condition.
Thus these Rorschach techniques have further extended our knowledges of studies of the deeper sphere of personality, presenting many important problems.

Moreover, there are many studies on what change and to what degree such a drug makes in the function of human mind. For example, some uses of Sodium Amytal with Rorschach technique have been administrated by the following authors: Kelly, D.M.(2), Wilkins, W.L. and Adams, A.J.(11), Warshow,L., Leiser,R., Izner,S.M. and Steine,S.B. (10), Satake,R. and Tanaka,F(8).

In order to demonstrate the behavioral change under the reduced consciousness control function, we have already studied the Rorschach performance in Alcoholic intoxication (4), and the change of association responses under intravenous Pentobarbital Calcium (3). Now, on the basis of our previous findings our present paper is concerned with the effect of Pentobarbital Calcium** ("Ravona" tablet) as prenarcotic dosage upon the Rorschach performance. This medicine belongs

to Barbituric acid derivatives and is widely used for hypnosis, soothing, anaesthesia before surgical operation, and painless delivery, etc. in Japan. Therefore, this medicine as well as chlorpromazine is considerably effective in reducing the control function of human consciousness.

Procedure

(1) First testing

Ss were 15 male undergraduate university students who had never experienced the Rorschach Test.   In the first testing the Rorschach Test was carried out individually under the experimental condition of administrating a dose of Ravona tablets. In order to examine the psycho-physiological effect of Ravona tablets, particularly their effect on the activation level of the autonomic nervous system, in 7 cases of the above-mentioned Ss the basal skin resistance value was measured before and after the Rorschach Test, the reflex wave being simultaneously recorded during the test.

The apparatus used was the Takei style GSR recorder and the electrodes were made from 1.5 centimeter long and 1.0 centimeter broad boards, and were attached to the fore-finger and third finger of Ss' right hand.   Four tablets of Pentobabital Calcium medicine, that is the so-called Ravona tablets, were given orally to each Ss (about 5 mg. per kilogram of body weight), for 7 above mentioned Ss, after the basal skin resistance value had been measured.   Each tablet contains 0.05 gr. Pentobarbital Calcium and the above dosage is equal to the prenarcosis dose.   This medicinal agent is usually called hypothalamus.

About 30 to 40 minutes after administering this medicine, the Rorschach Test was carried out by use of the routine technique.   While the test was in process, most of the Ss were observed to be in a lethargic and sleepy condition to a fairly notable degree, although, of course, it was possible for Ss to respond to the questions in the tets.   All responses and inquiries during the experiment were recorded by tape recorder.

(2) Second testing

Two months after the first testing, the Rorschach test as a control experiment was again carried out in the routine technique.   In this test the above medicine was not adminstered.   Moreover, 7 cases who sat for the GSR measurement in the first testing had to take the same test of the GSR as before ; about 30 to 40 minutes before the Rorschach test, the basal resistance values were measured, the reflex wave being recorded during the test, and soon after the test the skin resistance value was again measured.   However, in the case of the GSR measurement, in order to keep conditions as constant as possible, the shade temperature was controlled to remain at around 20°C during the first and second testing.

As for the arrangement of the results, those of three Ss out of the above 15 Ss were excluded from the results of the second testing, because one subject was not able to participate in the testing, and other two Ss had gained a detailed information or general understanding concerning the method of diagnosis during the two months' interval.

Results

A. On GSR (Galvanic Skin Response)
(1) Change of Basal Skin Resistance Value.

Table 1 shows the resistance value of the skin of 7 Ss which was measured before the administration of the Ravona tablets, and immediately after the Rorschach test in the controls and of those who took Ravona tablets respectively. From this table we may observe the following : For one S the resistance value immediately after the test increased in comparison with it before the Ravona dosage ($\Delta = +15K\Omega$), and for 6 other Ss all decreased, the average value being -58.5 KΩ (for the 7 Ss, average value$= -50.9K\Omega$). On the other hand, all 7 control Ss who showed a decrease of resistance value : moreover, the value of change was great, averaging about-92 KΩ. Therefore we can point out that the value immediately after the Rorschach test more decreased in comparison with that before the Raovna dosage and also that by the administration of Rorschach test the level of excitement of the autonomic nervous system was raised to some degree under both conditions. On the other hand, it was observed that under Ravona dosage such changed resistance value was lower in comparison with that of the controls in general. From this fact we may surmise that the level of excitement of the autonomic nervous system relatively declines under the condition of Ravona dosage.

(2) The Rate of Change in Conductance

In order to prove still more exactly the above findings, we computed the rate of change in conductance (ΔC) from each resistance value before and after the Rorschach test and examined the data under Ravona-Control conditions (Table 2).

Table 1. Basal skin resistance values
before and after Rorschach test

: kΩ

Ss	R-Condition			C-Condition		
	before	after	Δ	before	after	Δ
Ms	423	338	-85	320	256	-64
Ym	237	252	$+15$	495	405	-90
Kr	265	235	-30	240	237	-3
Im	412	384	-28	470	374	-96
Sh	476	369	-107	510	295	-215
Kt	267	196	-71	330	230	-100
Og	460	410	-50	320	270	-50
$\bar{x}$	407	339	-50.9	383.6	295.3	-92

Table 2. The change in conductance (ΔC)
under Ravona and control conditions

:μ $\mho$

Ss	ΔC	
	Ra.	Cont
Ms	-0.59	-0.78
Ym	$+0.25$	-0.44
Kr	-0.48	-0.05
Im	-0.17	-0.54
Sh	-0.60	-1.42
Kt	-1.35	-1.31
Og	-0.26	-0.57
$\bar{x}$	-0.45	-0.73

It was found that the average rate of change of conductance under the condition of Ravona was $- 0.45$ and that rate of change of conducatance under the normal condition was $- 0.73$, no statistically significant difference being found. However, it may be said that it has been ascertained that there is a tendency

for that the rate of change of the conductance becomes lower under Ravona dosage.

(3) The Relation between the Pattern of the Reflected Wave of the GSR and the Verbal Response during the Rorschach Test

The corresponding relation between the verbal response and the pattern of the GSR reflected wave was examined in the categories shown in table 3 and

Table 3. Five types show the corresponding temporal relation between the verbal response and GSR wave

Type	
A	Verbal response appears before the appearence of GSR wave
B	GSR wave appears before utterance and immediately verbal response appears
C	GSR wave appears before utterance and verbal response appears at the peak of GSR
D	GSR wave appears before utterance and verbal response appears at the descent of GSR
E	Verbal response appears after the deflection of GSR

on the model diagram in Fig. 1. In spite of no statically significant differences, Type A had a tendency to decrease and Type B,C, and D to increase (Table 4).
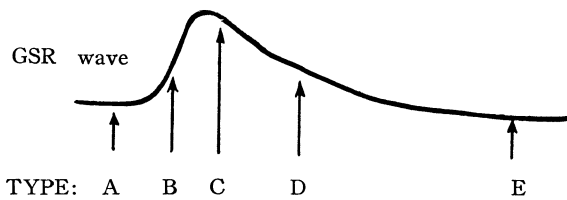
Fig. 1. Model for the classification of the corresponding temporal relation between the verbal response and GSR wave

Table 4. Mean percentage of frequency of each types

type Condition	A	B	C	D	E
Rav-cond.	50. 9	14. 9	4. 0	25. 9	4. 1
Cont-cond	69. 5	6. 4	0. 0	13. 8	10. 1

Table 5. Mean percentage of frequency of each types

		A	B	C	D	E
Ravona group	Exp.	54. 0	20. 0	2. 0	12. 0	12. 0
	Cont.	71. 2	3. 7	0. 0	16. 3	8. 9
Alcohol group	Exp.	85. 0	8. 0	5. 0	2. 0	0. 0
	Cont.	58. 0	10. 0	2. 0	14. 0	10. 0

In order to examine this tendency more closely, we compared the GSR record under conditions of alcohol with the first response of each 10 cards alone and we found that in those cases which took alcohol, type A had a tendency to increase

markedly, while conversely, under conditions of Ravona dosage, type A had a tendency to decrease and type B had a tendency to increase considerably (Table 5). From this result we may see that even though both the Ravona dosed condition and the alcohol condition lower the level of the consciousness control function, the aspects of the level they assume are not always the same, but rather in some cases there seems a contrary level to be observed. We will dwell on this subject under the head of 'the discussion', later.

B. Rorschach Performance

(1) Total Number of Responses (R), Reaction Time ($T/1R$), and the Time of Response (T/R)

Results obtained are shown in Table 6.

Statistically, as to $R, T/R, T/1R$, no significat differences were found between the Ravona dosed and the control conditions. But when we examined only those Ss who had a particularly small number of total responses and lacked productivity under conditions of control, we found a tendency to increase in the total number of responses under the condition of Ravona dosage, that is, for 5 Ss out of 6 Ss who showed $R \leqq 20$, R increased uniformly under the conditions of Ravona dosage, and the average of $\varDelta$ was 15. Moreover, in the case of the Ss whose initial reaction time was comparatively long under control condition, the reaction time had a tendency shortening under the condition of Ravona dosage; that is to say,

Table 6. The number of response, average response time
and initial reaction time

	R		T/R (sec)		T/R$_1$ (sec)	
	Rav.	Cont.	Rav.	Cont.	Rav.	Cont.
Ms	47	15	54	58	22	35
Zm	41	29	50	62	15	26
Ig	46	24	40	24	20	13
St	46	42	15	31	10	10
Ym	34	18	50	36	11	12
Bb	31	27	42	55	18	21
Hg	29	48	46	20	16	8
Sk	29	13	25	79	11	36
Kr	23	14	53	52	11	26
Di	21	20	49	61	16	27
Im	17	27	39	30	35	14
Sh	10	15	35	54	12	18
Ns	22		60		21	
Kt	17		96		46	
Og	30		41		9	
$\overline{x}$	29. 5	24. 3	46. 7	46. 8	18. 8	20. 5
$\widetilde{x}$	29	22	45. 5	53. 0	16. 0	20. 5

all 6 Ss who had $T/1R \geqq 20$ sec. showed a uniform shortening of $T/1R$ under the condition of Ravona dosage (the average $\varDelta\ T/1R = 13$sec.). Besides this, 4 Ss out of these 6 were the same above-mentioned subjects who lacked productivity.

Next, in order to examine the correlation between these numbers of total responses and the initial reaction time, we calculated the coefficient of correlation to all the experiments that we had made. The results are shown in Table 7.

Table 7. The coefficient of the correlation of the number of total responses and the initial reaction time under each conditions

	R_1	A_1	$[C_1] \rightarrow A_2$	$[R_1] \rightarrow C_2$	$[A_1] \rightarrow C_2$	C_1	$[C_1] \rightarrow C_2$
r	+0.07	−0.16	0.00	−0.58	−0.43	−0.66	−0.29

According to this, under the normal state($[R_1] \rightarrow C_2$, $[A_1] \rightarrow C_2, C_1$). The negative correlation tends to appear between the number of total responses and the initial reaction time; but under the condition of dosage (Ravona or Alcohol) there were but few correlations.

And no particularly significant change was found in the average reaction time.

When we compared our results with our former data (4, 5), we could not find any statistically significant R or T/R differences between the alcohol and the control group. We also could not find any significant differences of $T/1R$ in the control group, but in the alcohol group ($A_1, [C_1] \rightarrow A_2$) the initial reaction time significantly increased more than under the condition of Ravona dosage at the level of 1% or 5% respectively (T test).

(2) Location

Each number of responses of the main categories and its percentage as against the number of total responses is shown in Table 8. No statistically signficant differences could be found in any category of those under the condition of Ravona dosage in both groups.

The ratio of W to $D+Dd+S$ of each Ss is shown in Table 9 (D/W).

(3) Determinants

Table 10 shows the number of responses of each subject in the main categories and the percentage.

(a) Movement Responses

No statistically significant difference in the number of M and M% could be found between those under a Ravona dosed condition and under the controls.

As compared with other data which we had, previously obtained contrary to the findings in the control group, no significant differences in M% could be found under the condition of Ravona dosage, But in comparison with the alcohol group ($A_1, [C_1] \rightarrow A_2$) the M% dwindles significantly(10%, 1%, two taild U test). As to the FM, number of m, FM% and m%, no significant differences could be found between the conditions of Ravona dosage and of the control group.

A comparative examination with our former data also did not present any

Table 8. The number of responses classified into the location categories and each percentages to R

		W		D		Dd		S	
		Rav.	Cont.	Rav.	Cont.	Rav.	Cont.	Rav.	Cont.
Ms	n	37	11	10	4	0	0	0	0
	%	79	73	21	27	0	0	0	0
Zm	n	7	3	27	22	2	1	5	3
	%	17	10	66	76	5	3	12	0
Ig	n	28	22	18	2	0	0	0	0
	%	61	92	39	8	0	0	0	0
St	n	7	7	32	30	2	2	5	3
	%	15	16	70	30	4	5	11	7
Ym	n	24	14	10	3	0	0	0	1
	%	71	77	29	17	0	0	0	6
Bb	n	7	8	21	11	1	2	2	6
	%	22	29	68	41	3	7	7	23
Hg	n	9	19	16	24	4	4	0	1
	%	31	40	55	50	14	8	0	2
Sk	n	16	4	12	7	1	1	0	1
	%	55	31	41	54	4	8	0	8
Kr	n	21	12	2	2	0	0	0	0
	%	91	86	9	14	0	0	0	0
Di	n	9	3	13	15	0	2	0	0
	%	29	15	71	75	0	10	0	0
Im	n	8	19	8	5	0	0	1	2
	%	47	70	47	18	0	0	6	11
Sh	n	7	11	2	3	0	0	1	0
	%	70	72	20	22	0	0	10	0
Ns	n	6		15		0		0	
	%	41		59		0		0	
Kt	n	13		4		0		1	
	%	76		24		0		0	
Og	n	20		9		0		1	
	%	67		30		0		3	
$\bar{x}$	n	14.2	11.1	11.4	10.7	0.7	1.0	1.0	1.2
	%	51.5	50.9	43.3	36.0	2.0	3.4	3.2	4.8
$\tilde{x}$	n	8.5	11.0	12.5	6.0	0.0	0.0	0.0	1.0
	%	53	55	44	28.5	0.0	4.0	0.0	1.0

Table 9. The ratio of W to Dd + D+S under Ravona and control conditions

	Ravona	Cont.
Ms	0.27	0.36
Zm	3.86	7.33
Ig	0.64	0.09
St	4.57	4.29
Ym	0.42	0.21
Bb	3.00	1.38
Hg	1.78	1.26
Sk	0.75	1.75
Kr	0.10	0.17
Di	1.44	5.00
Im	1.00	0.26
Sh	0.29	0.27
Ns	2.50	
Kt	0.31	
Og	0.45	
$\bar{x}$	1.51	1.48

information which would lead to the assumption that there were particular changes in the FM% and m% under the condition of Ravona dosage.

(b) Depth, Vista, and Shading Responses

There were no significant differences in the FK%, KF+K %, FK+KF+K% between the condition of the Ravona dosed and that of the controls. However, the sum (Fc+cF+c)% of the shading response dwindled significantly in the controls (level of 1%), so it may be assumed, from a comparative examination of our former data also, that this reduction is one of the characteristic effects of Ravona.

(c) Form Responses and Responses Determined more or less by Color.

There were no signlficant differences inthe F% between those in a Ravona dosed condition and in the controls.

Our present experiments and also our former data revealed that the F+% showed a tendency to decrease in the case of the Ravona dosed as well as in the case of the alcohol dosed; but no statistically significant differences appeared.

Table 10. The number of responses classified into the determinants categories and each percentages to R

		M		FM		m		k		K		c		C'		F		F+%		Fc		CF		C		ΣC	
		Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont
Ms	n	6	2	4	1	1	0	0	0	0	0	1	0	1	0	25	12			6	0	2	0	1	0	6.50	0.25
	%	13	13	9	7	2	0	0	0	0	0	2	0	2	0	53	80	75	75	13	0	4	0	2	0		
Zm	n	6	1	5	3	1	0	0	0	0	0	0	3	0	0	24	21			4	1	1	0	0	0	3.00	0.50
	%	15	3	12	10	2	0	0	0	0	0	0	10	0	0	59	72	46	52	10	3	2	0	0	0		
Ig	n	7	3	2	2	0	0	0	0	0	0	3	2	0	0	15	10			8	7	10	0	1	0	17.00	3.75
	%	15	13	4	8	0	0	0	0	0	0	7	8	0	0	33	43	60	90	17	29	22	0	2	0		
St	n	6	4	4	1	0	0	0	0	2	3	0	3	1	2	20	18			6	8	4	3	3	0	12.75	9.75
	%	13	10	9	2	0	0	0	0	4	7	0	7	2	5	44	43	35	67	13	19	9	7	7	0		
Ym	n	6	5	7	2	0	0	0	0	0	0	0	0	1	0	19	8			0	3	1	0	0	0	2.25	2.25
	%	18	29	21	11	0	0	0	0	0	0	0	0	3	0	56	43	58	75	0	17	3	0	0	0		
Bb	n	4	1	1	0	0	0	0	0	0	1	1	2	2	3	19	20			3	0	1	0	0	0	2.50	0
	%	13	4	3	0	0	0	0	0	0	4	3	7	7	11	61	74	74	89	10	0	3	0	0	0		
Hg	n	0	2	0	2	1	0	0	0	0	0	2	5	2	1	14	23			5	10	3	4	2	0	9.25	10.75
	%	0	4	0	4	4	0	0	0	0	0	7	10	7	2	48	48	71	87	17	21	10	8	7	0		
Sk	n	1	0	2	1	0	1	0	0	1	0	0	1	0	3	22	4			2	2	1	1	0	0	2.00	2.25
	%	4	0	7	8	0	8	0	0	4	0	0	8	0	23	76	81	64	100	7	15	4	8	0	0		
Kr	n	4	3	0	2	0	0	0	0	0	0	1	0	1	0	11	7			3	2	2	0	1	0	5.25	1.00
	%	17	22	0	14	0	0	0	0	0	0	4	0	4	0	48	50	36	29	13	14	9	0	4	0		
Di	n	6	5	5	4	1	0	0	0	0	0	0	1	0	0	7	8			1	2	1	0	0	0	1.50	1.00
	%	29	25	24	20	5	0	0	0	0	0	0	5	0	0	33	40	100	25	5	10	5	0	0	0		
Im	n	2	3	1	5	1	1	0	0	0	1	0	1	2	2	7	11			4	2	0	1	0	0	2.25	2.50
	%	12	11	6	18	6	4	0	0	0	4	0	4	12	7	41	41	100	55	24	7	0	4	0	0		
Sh	n	3	7	0	3	1	0	0	0	0	0	0	0	0	0	5	4			1	0	0	0	0	0	0.50	0.00
	%	30	50	0	22	10	0	0	0	0	0	0	0	0	0	50	29	60	50	10	0	0	0	0	0		
Ns	n	6		2		1		0		0		0		1		8				1		3		0		4.00	
	%	29		9		5		0		0		0		5		36		50		5		14		0			
Kt	n	2		2		0		0		0		0		1		8				4		0		0		2.00	
	%	12		12		0		0		0		0		6		47		75		24		0		0			
Og	n	9		8		0		0		0		1		0		12				0		0		0		0.00	
	%	30		27		0		0		0		3		0		40		67		0		0		0			
$\overline{x}$	n	4.5	3.0	2.9	2.2	0.6	0.2	0	0	0.2	0.4	0.6	1.5	0.8	0.9	14.4	12.2			3.2	3.1	1.9	0.8	0.5	0	4.70	2.70
	%	16.7	15.3	9.5	10.3	2.3	1.0	0	0	0.5	1.3	1.7	4.9	3.2	3.5	48.2	53.7	64.7	66.2	11.3	11.3	5.7	2.3	1.5	0		
$\breve{x}$	n	6	3	2	3	0	0	0	0	0	0	0	1	1.0	0.0	14	10.5			3	2	1	0	0	0	2.70	1.70
	%	14	12	8	9	0	0	0	0	0	0	0	6	2.5	0.0	48	43	62	71	13	12	4	0	0	0		

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The FC% did not show any significant differences between those in the Ravona dosed condition and in the controls.

An examination of the results of our former study revealed that the FC% decreases significantly under the condition of alcohol dosage, on the contrary, such a tendency under the condition of Ravona dosage could not be found.

The CF% significantly increases more under the condition of Ravona dosage than in the controls (T test, one tailed, 5%). The $\Sigma C\%$ also increases more significantly under the condition of Ravona dosage than in the controls. But our comparative examination of the former data indicates that we may not be able to assert that all of these tendencies were due only to the effects of the Ravona.

(d) Other Composed Ssores

The value of $FC-(2CF+3C)$ and $\dfrac{VIII+IX+X}{R} \times 100$ of each S in both the Ravona dosed condition and in the control group is given in Table 11.

As may be observed in this table, the $FC-(2CF+3C)$ increases towards minus and $\dfrac{VIII+IX+X}{R} \times 100$ becomes greater under the condition of Ravona dosage (T test, one tailed, 0.5%).

Our comparative examination of the former data indicates that the $\dfrac{VIII+IX+X}{R} \times 100$ in particuliar has a tendency to increase only under the condition of Ravona dosage.

(4) Contents

Table 12 shows the results taken from the main category in relation to the contents. Only the Ad% and the (A+Ad)% significantly decrease more under the condition of Ravona dosage than in the controls (T test, two tailed, 5%).

A comparative examination of the former data showed that the Pl% and Obj% increased more under the condition of Ravona dosage than under the condition of alcohol dosage (A_1).

Table 11. The value of $\dfrac{VIII+IX+X}{R} \times 100$ and $FC-(2CF+3C)$

		$FC-(2CF+3C)$		$\dfrac{VIII+IX+X}{R} \times 100$	
		Ravona	Cont	Ravona	Cont
Ms	n %	−3	+0.5	32	21
Zn	n %	+2	+1.0	39	38
Ig	n %	−13.5	+7.5	37	31
St	n %	−9.5	+3.5	48	45
Ym	n %	−3	+2.5	35	29
Bb	n %	+1	0	48	33
Hg	n %	−5.5	−1.5	58	38
Sk	n %	0	+0.5	35	31
Kr	n %	−3.5	+2.0	34	29
Di	n %	−1	+2	58	40
Im	n %	+4.5	−1	36	33
Sh	n %	+1.0	0	30	36
Ns	n %	−4		41	
Kt	n %	+4.0		30	
Og	n %	0		24	
$\overline{X}$	n %	−2.3	+1.4	39	33.7
$\tilde{X}$	n %	−1	+0.75	38	33

Table 12. The number of responses classified into contents categories and each percentage to R

		H		(H)		Hd		(Hd)		A		(A)		Ad		(Ad)		At		Obj		A-Obj		Pl		Fire		Expr		Map. Pic. Phant		Nature, Lds, Water, Cloud		Stat, Arch Mask		Anal, Sex		P		(A+Ad)%		(H+Hd)%	
		Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont	Rav	Cont
Ms	n	6	2	2	0	0	0	0	0	8	6	1	0	0	2	0	0	3	0	12	3	1	1	1	0	1	0	2	0	4	0	1	1	3	0	0	0	7	8	17	73	13	13
	%	13	13	4	0	0	0	0	0	17	40	2	0	0	13	0	0	6	0	26	20	2	7	2	0	2	0	4	0	9	0	2	7	6	0	0	0	15	53				
Zm	n	6	2	0	1	1	4	1	0	10	7	0	3	3	4	0	0	3	1	4	2	2	3	2	1	2	1	3	0	1	0	1	0	2	1	0	0	6	2	31	62	17	45
	%	15	7	0	3	2	38	2	0	24	24	0	10	7	38	0	0	7	3	10	7	5	10	5	3	5	3	7	0	2	0	2	0	5	3	0	0	15	7				
Ig	n	9	6	0	0	2	0	1	0	4	5	0	0	3	2	0	0	1	1	5	3	1	0	6	2	2	2	2	2	0	0	3	1	2	0	0	0	3	4	16	29	24	25
	%	20	25	0	0	4	0	2	0	9	21	0	0	7	8	0	0	2	4	11	13	2	0	13	8	4	8	4	8	0	0	7	4	4	0	0	0	7	17				
St	n	3	3	8	3	1	1	2	3	7	6	1	2	2	6	0	0	4	5	0	3	2	1	1	2	3	2	1	1	0	2	2	2	0	2	0	0	3	0	19	28	9	9
	%	7	7	17	7	4	2	4	7	15	14	2	5	4	14	0	0	9	12	0	7	4	2	2	5	7	4	2	2	0	4	4	4	0	4	0	0	7	0				
Ym	n	3	3	3	2	2	0	1	0	11	5	1	2	2	0	0	0	1	1	5	3	0	0	2	1	0	0	1	0	1	0	3	0	1	1	0	0	5	6	38	29	15	17
	%	9	17	9	11	6	0	3	0	33	29	3	0	6	0	0	0	3	6	15	17	0	0	6	6	0	0	3	0	3	0	3	0	3	6	0	0	15	33				
Bb	n	4	1	0	0	0	0	0	0	8	7	0	2	2	3	0	0	2	1	5	3	3	2	3	2	1	0	2	1	1	0	2	1	1	2	0	0	7	6	33	37	13	4
	%	13	4	0	0	0	0	0	0	26	26	0	7	7	11	0	0	6	4	16	11	10	7	10	11	3	0	7	4	4	0	7	4	3	8	0	0	23	22				
Hg	n	1	4	0	0	1	0	1	1	3	8	0	0	5	8	0	0	2	1	1	0	1	0	6	6	2	2	1	3	0	1	0	2	0	1	0	0	3	3	27	34	8	8
	%	4	8	0	0	4	0	4	2	10	17	0	0	17	17	0	0	7	0	4	0	4	2	21	13	7	4	4	2	0	2	0	0	0	1	0	0	10	7				
Sk	n	1	0	1	1	0	0	0	0	10	3	4	0	3	3	0	0	0	0	0	0	0	0	4	2	3	3	2	1	1	1	0	0	0	0	0	0	5	2	45	47	4	0
	%	4	0	4	0	0	0	0	0	35	23	14	0	10	23	0	0	0	0	0	0	0	0	14	15	10	23	7	8	4	8	0	0	0	0	0	0	18	15				
Kr	n	4	3	1	1	1	0	0	0	2	3	1	0	0	5	0	0	1	0	3	0	1	1	4	7	1	1	0	0	3	1	0	0	2	0	0	0	2	6	9	57	21	22
	%	17	22	4	0	4	0	0	0	9	22	4	0	0	35	0	0	4	0	13	0	4	7	17	17	4	0	0	0	13	7	0	0	8	0	0	0	9	43				
Di	n	5	4	1	1	0	2	0	0	8	4	0	0	1	5	0	0	0	1	0	0	1	0	1	1	1	0	1	0	1	0	0	0	2	1	0	0	3	3	43	45	24	30
	%	24	20	5	0	0	10	0	0	38	20	0	0	5	25	0	0	0	5	0	0	5	0	5	5	5	0	5	0	5	0	0	0	5	5	0	0	15	15				
Im	n	2	3	1	1	0	0	0	1	3	6	0	1	1	1	0	2	1	0	3	6	1	3	2	1	1	1	0	1	0	0	0	0	2	1	0	0	2	9	24	26	12	11
	%	12	11	16	0	0	0	0	4	18	22	0	4	6	4	0	7	6	0	18	22	6	11	12	4	6	4	0	4	0	0	0	0	12	4	0	0	12	33				
Sh	n	3	8	0	0	0	0	0	0	2	3	0	0	0	1	0	0	0	0	2	0	0	1	1	0	0	1	2	0	0	0	0	0	0	0	0	0	2	6	20	29	30	57
	%	30	57	0	0	0	0	0	0	20	22	0	0	0	7	0	0	0	0	20	0	0	7	10	0	0	7	20	0	0	0	0	0	0	0	0	0	20	40				
Hs	n	5		2		0		0		4		1		1		0		1		0		1		0		3		0		0		0		3		0		2		23		23	
	%	23		9		0		0		18		5		5		0		5		0		5		0		14		0		0		0		14		0		9					
Kt	n	2		1		0		0		7		0		0		0		0		3		0		1		0		1		2		0		0		0		6		41		12	
	%	12		6		0		0		41		0		0		0		0		18		0		0		0		0		12		0		0		0		36					
Og	n	9		1		1		2		11		0		0		0		0		1		1		1		0		0		0		0		1		0		2		37		33	
	%	30		3		3		7		37		0		0		0		0		3		3		3		0		0		0		0		3		0		7					
$\overline{x}$	n	4.2	3.2	1.4	0.8	0.6	0.6	0.5	0.4	6.5	5.3	0.6	0.8	1.3	3.3	0	0.2	1.3	0.9	2.9	2.2	1.0	1.1	2.3	1.5	1.4	1.0	1.4	0.9	0.6	0.6	1.4	0.9	1.2	0.6	0	0	3.9	4.6	28.2	41.3	17.2	20.1
	%	15.5	15.9	5.1	1.8	1.8	4.2	1.5	1.8	23.3	23.3	2.0	2.2	4.9	16.3	0	0.6	3.7	2.8	10.3	8.1	3.6	4.4	8.0	7.2	5.4	4.4	4.8	2.2	2.5	2.6	4.8	2.2	4.2	2.0	0	0	14.5	23.8				
$\tilde{x}$	n	4.0	3.0	1.0	1.0	0	0	0	0	7.0	6.0	0	0	1.0	3.0	0	0	1.0	1.0	1.0	2.5	1.0	1.0	2.0	1.0	1.0	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	0.5	0	0	3.0	5.0	25.5	35.5	14.0	15.0
	%	12.5	15.0	4.0	0	0	0	0	0	19.0	22.0	0	0	5.5	13.5	0	0	4.0	1.5	12.0	7.0	4.0	7.0	8.0	5.5	4.0	3.5	3.0	1.0	2.0	1.0	3.0	1.0	5.0	0.0	0	0	15.0	19.0				

Discussion

A.   Concerning the Results of the GSR

It is generally considered that the GSR is a deflection of the activation level of the autonomic nerves and particularly of the activity of the sympathetic nerves, and so it can be used as an index of the level of psychological tension and it has been regarded as a sensitive index of the activation level. For example, McClearly, Lindsley, Woodworth and Schlosberg, Duffy, Malims, and others have reported thus.

On the other hand, it has been ascertained that the so-called sedative which we used and psychopharmachological agents such as a tranquilizer cause the level of psychological tension to fall. Thus, in such cases, it may be assumed that there will also appear a change in physiological indicators such as the GSR. Many results which support this assumption have been published; for example, Shiraiwa (7) found that in his study of the effect of barbiturates, the response of the GSR tended to decrease. Fujimori(7) also pointed out that anaesthetics such as Evipan, Ravonal, and Emipan suppress the emersion of the responses and also increase the basal resistance value. Schneider(7) pointed out the inhibitory effects of Amytal, Chlorpromazine, and Reserpine on the GSR: Lineart and Traxel (6), also reported that these medicines decrease the GSR and raise the basal resistance value.

On the basis of the above facts, we also assumed that the GSR would be suppressed by the effect of prenarcosis Pentobarbital Calcium (Ravona tablets).

An examination of our GSR records did not give a decisive conclusion, but we were able to verify that there were certainly such tendencies as above mentioned. That is to say, the GSR wave becomes evener under the conditions of dosage than under normal conditons, and the change of conductance becomes less under the former than under the latter condition.

In addition to the above facts, probably there were some reasons why we could not obtain a decisive conslusion concerning the psychophysiological effect of medicines.   It must be pointed out that there is to some degree an individual difference in the effect of drugs in our test, that there will be temporal changes in the effects of the medicine itself.   Furthermore, in our case, the fact that between the first and the second measuring of the GSR there is a considerably long interval to carry out the psychological test (Rorschach test), will provoke the elevation of general and mental excitement; and moreover there will be a differnce in that excitement among individuals.

So we made an additional experiment on the effect of Ravona upon GSR. That is, without the Rorschach test 3 Ss were given a dose of the above mentioned medicines and they were asked to be quiet for a time, and the temporal change of the basal skin resistance value was examined.   A sample of the effect obtained from two Ss is shown in Fig. 2.

In Fig. 2 a uniform increase in the resitatance value during about two hours after the dosage may be observed, and it may be interpreted that the emotional level of the autonomic nervous system was lowered as a result of the effect of the Ravona tablets.

We examined the corresponding temporal relationship between the verbal response of the Rorschach Test and the reflected wave of the GSR, concerning the effect of this drug which was thought to cause a decrease of the consciousness control function.
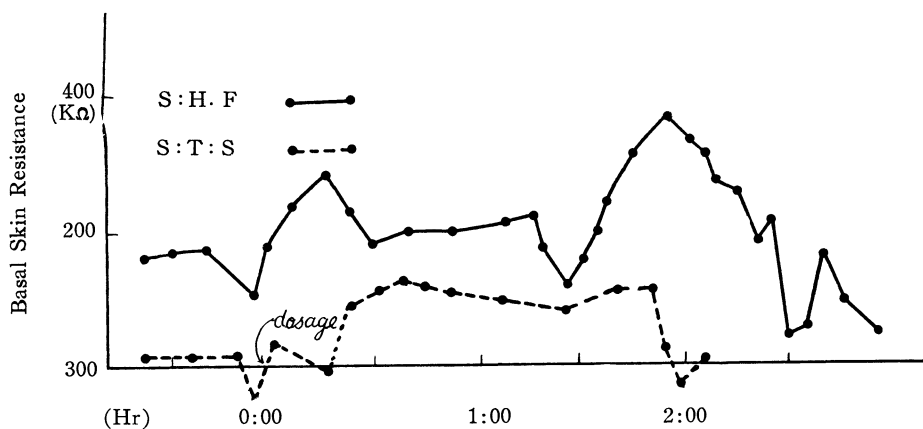
Fig. 2. A Sample of the Effect of Ravona

On the other hand, we think that the Rorschach Test situation is a kind of communicative situation. So the following processes can be thought to be fundamental.

1) First process : The experimeter hands a card with anbiguous figures to the subject and ask the subject to mention the images that flash through his mind, without hesitation.

2) Second process : Before communicating the certain images with some meaning to the experimenter, the subject has to integrate the imagery to some degree.

3) Lastly, the subject communicates the image to E through a verbal response. Therefore, there may be some people, who inspite of even though the experience of certain images, of their own will suppress them too much for expression.

Regarding such situation in Rorschach testing, it is a question whether such a process shows any difference between a normal condition and the other condition under which the consciousness control function is decreased after administration of drugs. Then, in order to verify this problem, we examined the corresponding temporal relation between the verbal response and the GSR wave. When Ss under the influence of Ravona tablets were compared with those in a normal condition, the cases in which the varbal response appeared before the appearence of GSR (type A) were found to decrease, and conversely, the cases in which the GSR wave appeared before the appearance of the verbal response (types B, C, D) increased. These tendencies were characteristic (Table 4), though the results revealed no significant differences statistically.

Futhermore, when we examined every first verbal response of each card including the data under the condition of alcohol dosage, the tendencies above-mentioned were uniformly supported in the case of Ravona dosage, conversely, type B, C, and D decreased and type A increased markedly, in the case of alcohol dosage.

Therefore, we may assume that Ss under alcohol dosage differ in the aspects of verbalizing the contents of consciousness from Ss under the Ravona dosage. That is, under the condttion of alcohol dosage, there may be some Ss who, though the integration of an image is not yet sufficient, first of all give out their verbal responses of mental imagery, and on the other hand, under the condition of Ravona

dosage, some Ss who need the inner effort to integrate the imagery. And it may be possible that the frequency of appearance of the GSR wave before the utterance is increased.   Our data are, however, rather insufficent to obtain the reliable results, but we will examine this feature more closely in the future.

B.   Rorschach Performance

(a)   Concerning R, T/R, and T/1R

From former studies, it is generally known that under the influence of Sodium Amytal, the same kind of anaesthesia Ravona, the rejection decreases, the number of total responses increases, and the average reaction time is shortened. For example, many others such as Kelly, D. M. et al. (2), Willkins, W. L. and Adams, A. J. (11), Warshow, L., Leises, R., Izner, S. M. and Steine, S. B (10), Satake, R, and Tanaka, F. (8) have pointed out the above facts.

However, according to our data under conditions of Ravona dosage, we were not able to find any of such results.   Many reasons can be given for this ; one of them is the fact that there seemed to be problems concerning the sample of the subjects. That is to say, the subjects who show the above tendencies in the data under the condition of Amytal dosage, were somewhat abnormal persons, who were generally defensive, poor in understanding, often inclined to refuse and to be evasive, and non-cooperative in a condition without medicine; for examples, neurotic patients in the study of Wilkins et al., juvenile delinquents in the study of Satake et al. But we can expect that even such subjects increase their understanding and become communicable due to the effect of drugs, relatively decreasing the rejection, increasng the productivity and the number of total responses, and thus shortening the average reaction time.

But in our cases Ss., who are normal (generally cooperative) undergraduate students, whose number of responses is relatively great whitout medicine, it may be doubtful whether the the results above mentioned due to the effect of drug will appear so typical or not. Warshow et al. (10), who made a study of these points compar -ing and examining both groups of neurotic patients and normal subjects, states that normal subjects who give abundant responses under ordinary conditions do not show any change under the condition of Amytal dosage, but that some of neurotic patients who were non-cooperative and give few response under a normal condition showed abundant responses under a condition of medication.

If we choose some subjects from our data who were poor in response under normal conditions and compare the data with those of the same subjects under conditions of medication, we can clearly see that the number of total responses increases under a condition of medication (refer to page 5).

Our results did not show any particular tendencies in the average reaction time.   But as for the initial reaction time, if we choose the data of some subjects who need a rather long time to react under normal conditions, and compare them with those of the same subjects under a condition of Ravona dosage, we can clearly see that the initial reaction time is reduced under the conditions of medication.

It is pointed out that a counting of the coefficient of the correlation of the number of total responses and the initial reaction time reveals that the number of total responses and the initial reaction time have a negative correlation between Ss without drugs and those under the condition of alcohol dosage, while on the

other hand, there is no correlation between under the conditon of drugs and under the alcohol dosage.

So, while under normal conditions there is a tendency to react more quickly in one group of Ss having adundant productivity, and another tendency to react more slowly in another group of Ss who have poor productivity and are non-cooperative, it may be supposed that such tendencies come to be averaged and become more uniform under the influences of drugs and alcohol.

(b) Location

Satake, R. et al. (8) have reported in connection with the category of location that they found a decrease of W% and an increase of D% and d% under the condition of Amytal dosage, but we did find such reults.

(c) Determinats

Warshow et al. (10) pointed out that in the cases of neurotic patients who were relatively non-cooperative, M and FM increased under the condition of Amytal dosage. And similarly, Wilkins et al. (11) who examined neurotic patients reported that they found a decrease of F% and an increase of M and FM. Satake et al, who treated juvenile delinquents, stated in their papers that they found prominent increases of M, FM, CF, and sum C.

On the whole, however, the evidence of our data may be summarized in the following three points concerning the effects of Ravona tablets.

(i)   (Fc+cF+c)% decreases significantly.

(ii) CF% and ΣC increase signifcantly.

(iii) $\dfrac{\text{VIII}+\text{IX}+\text{X}}{\text{R}} \times 100$ increases significantly.

(i) As to the reason why the value of all the shading responses, (Fc+cF+c)%, decreased significantly under the condition of Ravona dosage, we may point out various factor. One is the over-all deteriorations of the control function of consciousness caused by Ravona tablets. Moreover, in this case we may surmise that the teneous nature of the mechanism of reception, the most superficial phase of the individual's personality, may have been already lost. Concerning this point, even though there is the same decline of the control function of consciousness, the fact that we could not find such a decline of (Fc+cF+c)% shows the differences in the aspects of the effectiveness for various drugs (alcohol and Ravona) in the alcohol Rorschach test, which has a thematic nature, astringency and selectivity of association.

(ii) In our present studies, CF% and ΣC increase significantly under the condition of Ravona dosage. The same results have been reported in the studies of Satake et al. using Amytal; he pointed to the decline of the control of emotionality under the influence of the drugs, and furthermore reported that it might be regarded as an index of the acceleration of suggestibility or of impulsive tendency.

It is a considerably interesting matter that though in the alcohol Rorschach test which we had admnistered, we observed a considerable high emotionality in the behaviour of the subjects, the change of color responses used as index in the Rorschach scores did not appear distinctly, but conversely, in the condition of Ravona, in spite of the fact that a calm and lethargic behavior pattern was observed, in the protocol the index of the emotional aspect was scored very distinctly. This fact is very important

when we consider its projectivity in Rorschach test.

(iii)   We suppose that the result of the $\dfrac{\text{VIII}+\text{IX}+\text{X}}{\text{R}}\times 100$ which is significantly high under the condition of Ravona dosage has connections with the emotionality mentioned above.   But the median of $\dfrac{\text{VIII}+\text{IX}+\text{X}}{\text{R}}\times 100$ is 38% and therefore we cannot always interpret it clinically as an index of a high emotionality.

Rather, this response is more easily induced under the Ravona dosed condition than under other conditions (i. e. alcohol dosed and normal conditions), taking a pattern which is in conformity with the external stimulus material on every card, and leading us to suppose that the response set to the achromatic cards had little connection with the reaction to the chromatic cards.   This point differs from the alcohol Rorschach test.

Lastly, the fact that such changes were not particularly noticeable under the condition of Ravona dosage compared with the fact the FC% decreased and the M% increased under the condition of alcohol dosage aroused our interest.   It seems that the fact which the FC% decreased signifificantly under the condition alcohol dosage means that the attitudes of the subjects toward the external world becomes considerably subjective and the objectivity is lost under the same condition. However, the reason why such changes did not appear under the condition of Ravona dosage may be that they rarely lost their objectivity.

In the alcohol Rorschach test characterized by the continuity, astringency, and innergenesis of association, the increase of M was marked, but in a sense we could not find such a tendency under the condition of Ravona dosage.   From this fact, we may assume that under Ravona dosage there was a greater degree of dependence on the external stimuli in the attitude of the subjects.   It seems that marked increase of the above mentioned CF% and $\dfrac{\text{VIII}+\text{IX}+\text{X}}{\text{R}}\times 100$ is large enough to signify this point.

In the results of the Rorschach test carried out under the condition of Sodium Amytal, M or FM increased, and this has led us to the interpretation that a reaction was raised against the internal stimulus. Our results, however, are negative in this respect.   As to this point, the prime consideration is, as we have already stated before, that the subjects in use of our experiments were all normal undergraduate students, while the subjects in the Amytal Rorschach test were generally defensive neurotics, juvenile delinquents, and psychotics. In such abnormal cases, as Warshow et al. (10) pointed out, there are many cases in which under a routine adminietration the responses are refused and the protocol becomes poor; therefore one is able to odtain only incomplete data.   But in Amytal testing, it is easy to make the rapport with the subjects and the protocol also becomes abundant, so one is able to obtain effective clues in diagnosis; however, if normal undergraduate students who show relatively abundant responses are chosen as subjects, it is a question whether one may expect such dramatic changes by using drugs.

(c)   Contents

Satake, R. et al. (8),   regard the decreased A% and P% are the effect of Amytal, and interpret it as the tendency to turn aside   from social, ordinary norms in the process of thinking; and our data showed results which generally supported this

fact. (But only Ad% and (A+Ad)% showed a significant difference.) Moreover, compared with the condition of alcohol dosage, Pl% and Obj% increased signiacantly under the condition of Ravond dosage, but it seems that Pl% has some relations with the increase of CF%.

V Summary

For the purpose of domonstrating the behavioral change under the lowered control function of consciousness, the change of Rorschach's performance under the influences of Pentobarbital Calcium ("Ravona" tablet) as a prenarcotic dosage was examined. Ss were 15 male under-graduate studients, but 3 of them were omitted from the results of control experiment. Moreover, in order, to examine the psycho-physiological effect of Ravona, in 7 students of the above-mentioned 15 Ss, the basal skin resistance value was measured before and after the Rorschach test, the reflex wave being simultaneously recorded druing the test.

Comparing and examining the results, the following conclusions were derived;
1) Though no statistically significant difference was found, from the records of the basal skin resistance value, it may be permissible to say that the level of excitment of the autonomic nervous system tended to decline under Ravona dosage.
2) Though, as a whole, no statistically significant difference was found, if we choose poor-productivity subjects only, it was found that the number of total responses(R) increases and the initial reaction time (T/1R) is shortended under the Ravona condition.
3) Concerning the effect of Ravona tablets, our findings may be summarized as follows;

    a) $(Fc+cF+c)\%$ decreases significantly

    b) $CF\%$ and ΣC increases significantly

    c) $\dfrac{\text{VIII} + \text{IX} + \text{X}}{R} \times 100$ increasee significantly

    d) $Ad\%$ and $(A+Ad)\%$ decreases significantly

4) From comparison and exmination of the results of our former studies, the main characteristic tendencies under the Ravona dosage were theoretically dicussed.

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Résumé

Afin de constater le changement du comportement dans la réduction du contrôle conscient, nous avons examiné le changement de Rorschach-test dans les influences de Pentobarbital Calcium (tablette de "Ravona"). Les sujets de notre expérience furent 13 étudiants.

D'ailleurs, pour éprouver les effets psycho-physiologiques de Ravona, chez 7 sujets parmi les étudiants, la résistance galvanique de peau a été mesurée avant et après le Rorschach-test, et la fluctuation de R. P. G. s'est enregistrée au cours du test.

En comparant et examinant les résultats, nous sommes arrivés à la conclusion comme suit :

1) Il se peut bien que le niveau de l'activité dans le système nerveux autonome soit sujet à décliner dans la condition de Ravona, bien que il n'y ait pas de différence signifiante statistiquement dans le mesurage de la résistance galvanique de peau.

2) Si nous choisissons les subjets qui ont été peu productifs, il se trouve que R augmente et T/1R est diminué dans la condition de Ravona.

3) Quant aux effets de Ravona, notre constatation se peut résumer comme les suivants ;

   a) (Fc+cF+c)$\%$ diminue significativement,

   b) CF $\%$ et ΣC s'augementent significativement,

   c) $\dfrac{VIII+IX+X}{R}$ x 100 s'augmente significativement,

   d) Ad $\%$ et (A+Ad)$\%$ diminue significativement.

4) Les tendances caractéristiques dans la condition de Ravona ont été discutées théoriquement, après la comparaison et examen des résultats dans notre recherche antérieure.

Zusammenfassung

In der Absicht zur Untersuchung der Verwaltungsveränderung unter der niedergelassen Kontrollsfunktion des Bewusstseins, untersuchten wir die Verändetung der Rorschach-Ausführung unter dem Einfluss von Pentobarbital Kalzium ("Ravona" Täfelchen) als vornarkotische Dosis. Die Versuchspersonen waren 13 Studenten. Um die psychophysiologische Wirkung von "Ravona" zu untersuchen wurde an 7 von

den 13 Versuchspersonen der grundlegende Hautwiderstandswert von G. S. R. vor und hinter dem Rorschach-Test gemessen und wurden die Reflex-Kurven die Test hindruch beschrieben. Nach 2 Monaten wurden zweiten Rorschacha-Teste als Kontrollversuche unter normaler Bedingung angestellt.

Wir verglichen und untersuchten die Daten der zwei Versuche, und dann kamen wir zu folgenden Schlüssen;

1) Die Aktivität des autonomen Nervensystems zeigte die Neigung zum Vermindern unter der Ravona-Kondition.

2) Was die gering produktiven Versuchspersonen betrifft, fand sich, dass unter Ravona-Kondition "R" sich vermehrte und T/1R sich verminderte.

3) In Bezug auf die Wirkung dieser Arznei "Ravona", gelangt man zu folgenden Schlüssen :

   a) (Fc+cF+c)% verminderte sich signifikant,

   b) CF% und ΣC vermehrten sich signifikant,

   c) $\dfrac{\text{VIII}+\text{IX}+\text{X}}{\text{X}}$ X 100 vermehete sich signifikant,

   d) Ad% und (A+Ad)% verminderten sich signifikant.

4) Nach Vergleichung und Untersuchen der Daten haben wir die hauptsächlich charakteristische Tendenz unter der Ravona-Kondition theoretisch erörtert.