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STUDIES ON SENSORY DEPRIVATION : III

PART 4. THE EFFECT OF SENSORY DEPRIVATION UPON "SPEED ANTICIPATION" AND "TIME ESTIMATION"

By

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The effect of sensory deprivation upon "speed anticipation" and "time estimation" was investigated.

As to speed anticipation, it was studied whether or not the following fact became clear after sensory deprivation that when the speed of the gliding light to be anticipated was experimentally varied, subjects tended to estimate it faster or slower than its objective speed. The result was not distinct. But it was noticed that when the speed of the gliding light to be anticipated was experimentally varied from "slow" to "fast", the change of the time estimated became nearer to the objective change in the experimental group than in the control group at post test.

As to "time estimation", in the case of the estimation of short time, the time estimated became shorter and the rate of tapping increased more in the experimental group than in the control group at the post test. In the case of the estimation of long time, it was noticed that there was a discordance between the duration time of sensory deprivation estimated by subjects. With the relationship between the estimation of short and long time, it was seen that subjects who estimated "long time" at shorter time than others estimated "short time" at longer time than others, although it is not statistically significant.

In this study, the effect of sensory deprivation upon speed anticipation and time estimation were investigated.

(1) Speed Anticipation

It was found in the previous studies that the "anticipation time" of subjects who experienced the sensory deprivation became longer than that of subjects who did not experience the sensory deprivation⁽²⁾. In the present study we paid our attention to the fact that when the speed of the gliding light to be anticipated is experimentally varied from "slow" to "fast", subjects show a tendency to estimate it faster than its objective speed, and when it is experimentally varied from "fast" to "slow", there is a tendency to estimate it slower. The aim of this study was to investigate whether or not such tendency was enlarged after the sensory deprivation.

Procedure: Speed anticipation test was administered to both experimental and control subjects in the following way: Subjects were required to estimate the time intervals of first 2080 ms. (Series 1), next 1040 ms. (Series 2), then 2080 ms. (Series 3), 4160 ms. (Series 4), and at last 2080 ms. (Series 5) — five trials were made in each series.

The experimental subjects were tested before and after the sensory deprivation of 24 hrs., and the control subjects were tested at almost the same intervals. The

control subjects did not experience the sensory deprivation.

Scoring: The mean "anticipation time" of each series, X_1, X_2, X_3, X_4, X_5 was calculated, and on the basis of it the rate of change of "anticipation time" (R) was calculated;

$$R_1 = \frac{X_2 - X_1}{X_1} \times 100, \quad R_2 = \frac{X_3 - X_1}{X_1} \times 100,$$

$$R_3 = \frac{X_4 - X_1}{X_1} \times 100, \quad R_4 = \frac{X_5 - X_1}{X_1} \times 100,$$

finally, the deviation of R of subject from R^* of objective stimulus (D) was calculated;

$$D_1 = |R_1 - R_1^*|, \quad D_2 = |R_2 - R_2^*|, \quad D_3 = |R_3 - R_3^*|, \quad D_4 = |R_4 - R_4^*|.$$

RESULT AND DISCUSSION

The results are summarized in Table 1 and Table 2. Generally speaking, the D decreased at the post test in both the experimental and the control groups. But it is also true that the individual difference is rather large and the D of all subjects did not always decrease at the post test. Accordingly, the difference between the experimental and the control subjects was not distinct except that the rate of subjects whose D_1 decreased at the post test was larger in the experimental group than in the control group. The decrease of D means that subjects became more accurate in the judgment on the change of the speed of the gliding light after the sensory deprivation and it is regarded as the result of the repetition of the test rather than the effect of sensory deprivation, because it was shown in both the experimental and the control groups. But the fact that the rate of subjects whose D_1 decreased at the post test was larger in the experimental than in the control subjects suggests that the individual difference of subjects was decreased by sensory deprivation and there is a certain relation between "suggestibility" and sensory deprivation. However, the difference between experimental and control subjects is not distinct. This is considered to be owing to the following two points. Firstly, we used the control group method. In this experiment, it was difficult to compare the experimental group with the control group as a whole, because the individual difference was so large in both groups. Secondly, the time when the post test was given to subjects was one hour

Table 1. The deviation from objective rate of change.

	D_1		D_2		D_3		D_4		D_5	
	pre -test	post -test	pre -test	post -test	pre -test	post -test	pre -test	post -test	pre -test	post -test
Exp. G.	23.6%	13.4%	14.7%	12.5%	32.9%	40.9%	20.4%	18.2%	91.6%	85.1%
Cont. G.	12.6%	10.4%	16.4%	9.9%	56.7%	42.0%	20.6%	15.5%	102.5%	73.1%

Table 2. The rate of subjects whose D decreased at the post test.

	D ₁	D ₂	D ₃	D ₄	Total
Exp. G. (10)	8/10	5/10	4/10	6/10	5/10
Cont. G. (9)	5/9	7/9	4/9	5/10	6/9

after sensory deprivation. This is also pointed out in the case of Aktutalgenese (see Part 3). It is held that the effect of sensory deprivation was considerably lost, in the course of an hour, since it is gradually reduced in process of time.

In the future study we will examine similar points immediately after the sensory deprivation.

(2) Time Estimation

In the present study we investigated the relation between the estimation of short time (1 minute) and long time (24 hours, that is, the elapsed time during sensory deprivation).

Procedure: The short time was estimated by the same procedure as that of the previous study. Subjects were asked to tap the key at his personal tempo for a time which was one minute in his judgment.

The long time was estimated by the reply of subjects to the following questions just after the sensory deprivation.

Question (1) "How long do you think you have been here in this room?"

Question (2) "Then, what day of the month is it and what time of the day is it?"

RESULTS

The results are summarized in Table 3.

Table 3. The time estimated by subjects.

the time to be estimated subjects	60.0 second	24 hour	what time of the day
S A I	20.0 sec.	24.0 hr.	a.m. 8~10 2nd day
KAW	20.8 sec.	18.0 hr.	p.m. 1~2 2nd day
OKA	40.5 sec.	14.0 hr.	a.m. 4 2nd day
KAK	43.6 sec.	12.0 hr.	a.m. 8~9 2nd day
TAKA	44.0 sec.	14.5 hr.	a.m. 8 2nd day
OKU	51.7 sec.	20.0 hr.	noon 2nd day
I T O	54.3 sec.	12.0 hr.	daybreak 2nd day
TAKE	65.7 sec.	26.0 hr.	p.m. 1.30 2nd day
Mean	42.6 sec.	17.6 hr.	

In the case of the estimation of short time, the time estimated by subjects became shorter, and the rate of tapping increased more in the experimental group at the post test. In the case of the estimation of long time, it was noticed that there was a discordance between the duration time of sensory deprivation estimated by subjects and the time of the day supposed by the same subjects.

As to the relationship between the estimation of short time and long time, it was seen that those subjects who estimated "short time" at longer time than others estimated "long time" at shorter time than others. But it is not statistically significant.

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ZUSAMMENFASSUNG

Der Einfluss von sinnlicher Entziehung auf Geschwindigkeitsanschlag und Zeitschätzung wurde untersucht.

Über Geschwindigkeitsanschlag wurde die Tendenz untersucht, dass wenn die Geschwindigkeit des Lichtes, die die Versuchsperson anschlägt, experimentell geändert wurde, die Versuchsperson die Geschwindigkeit schneller oder später als die objectiven anschlägt. Aber keine klare Wirkung der sinnlichen Entziehung wurde gefunden. Vielmehr ist es merkwürdig, dass sich die Veränderung der veranschlagten Geschwindigkeit von den Versuchspersonen der experimentellen Gruppe der Veränderung der Reize mehr als die von den Versuchspersonen der kontrollierten Gruppe näherte.

Über Zeitschätzung: Von der Zeitschätzung der kurzen Zeit (1 Minute), fand es sich, dass die geschätzte Zeit länger wurde und der Prozentsatz des "Tipps" bei der experimentellen Gruppe sich mehr vermehrte als bei kontrollierte Gruppe. Es verhält sich mit dem Resultat der ersten Untersuchungen nicht anders. Bei der Zeitschätzung der langen Zeit (24 Stunden) wurde festgestellt, dass die von den Versuchspersonen veranschlagte Fortdauerzeit der sinnlichen Entziehung nicht mit der Tages, worauf dieselben Versuchspersonen schätzten, sehr schlecht übereinstimmte. Diejenigen, die kurze Zeit auf längere Zeit als die anderen, schätzten die "lange Zeit" kürzer als die anderen. . . . Das ist aber nicht statistisch signifikant.