

Studies on Sensory Deprivation: V. Part 2. On the Results of Introspective Reports

著者	UENO HITOSHI, OHYAMA MASAHIRO, OYAMADA TAKAAKI, KATO TAKAYOSHI
journal or publication title	Tohoku psychologica folia
volume	25
number	1-2
page range	4-8
year	1966-12-24
URL	http://hdl.handle.net/10097/00122499

STUDIES ON SENSORY DEPRIVATION: V.

Part 2. ON THE RESULTS OF INTROSPECTIVE REPORTS

By

HITOSHI UENO (上野 勲), MASAHIRO OHYAMA (大山正博),
TAKAAKI OYAMADA (小山田隆明) and
TAKAYOSHI KATO (加藤孝義)

(Department of Psychology, Tohoku University, Sendai)

The results of interview with subjects who spent 24 hours in sensory deprivation, as well as the records of their behavioral observation and EEG are described.

1) 24 hour sensory deprivation imposed more or less strain and stress on most subjects. The effects of sensory deprivation upon their mental states manifested themselves in the form of the loss of temporal orientation in the time estimation, in the unusual experiences such as illusions and hallucinations, and in the unbalance of psycho-physical functions suggested by unstable sensation of the temperature and the feeling of general dullness.

2) The sleep during sensory deprivation was taken up as an aspect of the manners in which they adjusted themselves to this condition. Their ways of adjustment that could be found in the tendency of falling asleep at an early period of the confinement are classified under 3 types. 8 subjects of Type I fell asleep soon after the beginning of the confinement, 3 subjects of Type II stayed up for the first 2 or 3 hours of the confinement and then fell asleep, only 1 subject of Type III sat up for the first 6 hours and then fell asleep.

The following results were obtained by our previous studies:

1) During sensory deprivation ranging from 18 hours to 48, many subjects felt anxiety, loneliness, need of affiliation, general dullness and bodily pains or complaints.

2) Under this condition, some subjects had dreams, fantasies, illusions and hallucinations.

3) Comparative investigations of the records of interview, of behavioral observation, of polygraph, and Rorschach Test performance, revealed that subjects who reported that they had spent the sensory deprivation period in a pleasant and clam state showed low activity grade and well-integrated ego control, while on the contrary, subjects who reported that they had felt unpleasant and restless during this period showed high activity grade and poor-integrated ego control.

Based on our previous studies, the present study was thus concerned primarily with the psycho-physical aspects of adjustment to 24 hour sensory deprivation in each subject. That is, the ways in which subjects adjusted themselves to this condition, and how their mental states were influenced under this condition were investigated.

METHOD

After all post-tests were over, subjects were requested to report their own experiences during sensory deprivation, in answer to our questions.

Main items of the questions were as follows:

- 1) Attitude toward this experiment
- 2) Actgramme
- 3) Time estimation
- 4) Emotional states
- 5) Psycho-physical symptoms
- 6) Hallucinatory experiences

RESULTS

- 1) Attitude toward sensory deprivation

Before the experiment, all of 12 subjects showed cooperative attitude toward our experiment, though 3 of them expressed their anxious feeling about it. On the contrary, after it, 8 of 12 subjects expressed their negative feelings: for example, "I felt uncomfortable and uneasy." or "I would rather excuse myself from participating in such experiment again." But each subject looked delightful when he was released from the confinement. And then they showed favourable and cooperative attitude toward our post-tests.

- 2) Types of adjustment to sensory deprivation

In view of the investigation into the records of actgramme, which were compared with those of behavioral observation and EEG, the sleep during sensory deprivation was taken up as one aspect of adjustment to this condition. We could find a clue to judgement on each adjustment type in subjects' tendency to falling asleep at an early period of the confinement. For consciousness of subjects became unclear and drowsy since the time they awake from their first sleep. The ways of adjustment of subjects within the first 6 hours of the confinement were classified under 3 types: Type I, Type II, and Type III.

8 subjects of Type I fell asleep soon after the beginning of the confinement. 3 subjects of Type II sat up for the first 2 or 3 hours, ate crackers, drank water and juice, passed urine, sang songs, or recalled to their mind memories, and then fell asleep. Type III was found in only 1 subject, who kept awake for the first 6 hours, behaving in much the same way as the subjects in Type II, and then fell asleep.

When all subjects, regardless of the adjustment type, waked up from their first sleep, they were in an almost similar mental state. That is, they lost the temporal orientation, had an indistinct drowsy consciousness, their thinking processes were disturbed, and their spatial orientation were distorted and had illusions and hallucinations.

Moreover, another aspect of adjustment to sensory deprivation was also found in the sensitive reactions of the autonomic nervous system such as pain in stomach and

call of evacuation (shown by 4 subjects) or in the call for release from the confinement (shown by 1 subject).

3) Experiences under sensory deprivation

The following results were obtained from interview:

i) Emotional states

2 out of 12 subjects felt pleasant and calm during the confinement period, while others felt more or less unpleasant, uneasy, and tense during this period.

ii) Bodily symptoms

Nearly every subject had the feeling of general dullness and the complaints of sweat and thirst.

iii) Time estimation

Subjects were requested to answer the following question at 21, 22, and 23 hours after the confinement and when they were released from the confinement: "What time is it now?" Moreover, in the interview after the confinement, they were inquired about the term of sensory deprivation. That is, "How long did you stay at the room?"

As our previous studies already verified, this study also proved that their subjective estimation of the time under this condition had been underestimated (Table 1.)

Table 1. Result of time estimation

Objective time	Subjective time (Range)	Overestimation (Number)	Underestimation (Number)
10 a.m. 2nd day at 21 hours after the confinement	3 a.m.-3:30 p.m. 2nd day	2	9*
11 a.m. 2nd day at 22 hours after the confinement	11 p.m. 1st day - 3 p.m. 2nd day	3	9
12 a.m. 2nd day at 23 hours after the confinement	2 a.m.-1:30 p.m. 2nd day	2	9*
1 p.m. 2nd day 24 hours after the confinement	3 a.m.-7 p.m. 2nd day	2	10**
24 hour sensory deprivation	Mean: 19.5 hours	1	10**

* $P < .05$

** $P < .025$

iv) Unusual experiences such as illusions and hallucinations

In interview, 11 of 12 subjects reported that they had unusual experiences such as illusions and hallucinations during sensory deprivation. These experiences were observed more frequently in the auditory sensation (Table 2.).

These hallucinatory experiences were as follows:

a) The experiences on which subjects' hunger for external stimuli seemed to

Table 2. Modality of hallucinatory experience

Modality	Visual S.	Auditory S.	Olfactory S.	Cenesthesia
Number	2	11***	3	1

*** P < .01

be projected: for example, "I felt I had heard the sound of time siren of a department store," or "I suspected someone had come to the room and opened the door."

b) The experiences which seemed to be most akin to hallucination, but which could not be easily distinguished from the image: for example, "I felt as if my stomach had become a withered tree." or "I saw a vivid image of a bathing place."

c) The experiences which might be identified with the illusions: for example, "I heard the pattering of rain drops." or "I heard the cicada chirrup." Perhaps, it is considered these were experiences which were caused by the subjects' mishearing the sound of a fan.

DISCUSSION

24 hour sensory deprivation imposed more or less strain and stress on most subjects. This implied the reduction of usual external stimuli and loss of a meaningful situation.

The result of time estimation involved the loss of temporal orientation. The unusual experiences such as illusions and hallucinations implied the distortion of spatial orientation. And bodily symptoms as unstable sensation of the temperature and the feeling of general dullness suggested the unbalance of psycho-physical functions. These will be regarded as the effects of sensory deprivation upon the subjects' mental states.

It seemed to be certain that 3 types of adjustment at an early period of the confinement were to be regarded as one consequence of mechanism for defending themselves against the strained condition, that hallucinatory experiences were to be regarded as another outcome of mechanism for finding meaning in the meaningless situation, and that autonomic irritable reactions and call for release from the confinement suggested the limit of tolerance for this condition or maladjustment to this condition.

REFERENCES

- 1) Kokubun O. & Ohyama M. Studies on sensory deprivation III Part 7. On the results of the behaviour observation and introspective reports, *Tohoku Psychol. Folia*, 1965, 23, 75-78.
- 2) Mendelson J.H., Kubzansky P.E., Leiderman P.H., Wexler D. and Solomon P. Physiological and psychological aspects of sensory deprivation, a case analysis, In Solomon, et al, (Eds.) *Sensory deprivation*, Cambridge: Harvard Univ. Pr. 1961, 91-113.
- 3) Sato I. & Ohyama M. Studies on sensory deprivation I Part 3. Rorschach performance in sensory deprivation, *Tohoku Psychol. Folia*, 1963, 22, 25-35.
- 4) Sato I. & Ohyama M. Studies on sensory deprivation IV Part 3. Results on introspective reports, time estimation and unusual experience, *Tohoku Psychol. Folia*, 1965, 24, 10-12.

- 5) Zuckerman M., Albright R.J., Marks C.S., and Miller G.L. Stress and hallucinatory effects of perceptual isolation and confinement, *Psychol. Monog.* 1962, 76, No. 30.

(Received September 20, 1966)

ZUSAMMENFASSUNG

Im Vergleich zu den Protokollen der Verhaltensbeobachtung und EEG, beschreiben wir die Ergebnisse des Gesprächs mit 12 Versuchspersonen, die die 24 stündige sinnliche Entziehung erfuhren.

Aus den Resultate folgt:

1) Die 24 Stunden währende sinnliche Entziehung bürdete den meisten Versuchspersonen mehr oder weniger Spannung. Wir merkten die Einflüsse von sinnlicher Entziehung auf ihre psychischen Zustände an dem Verlust an der zeitlichen Orientierung, die sich in den Resultaten der Zeitschätzung zeigte, an dem Ungleichgewicht der psychophysikalischen Funktionen, das von der labilen Empfindung der Temperatur und von dem Gefühl der Müdigkeit andeutet wurde, und an den ungewöhnlichen Erfahrungen wie die Illusionen und Halluzinationen.

2) Der Schlaf während sinnlicher Entziehung wurde als eine Phase der Anpassung an diesem Umstand aufgenommen. Durch die Tendenzen von der Versuchspersonen, die in der ersten Periode der sinnlichen Entziehung in Schlaf verfallen, ermöglichte sich eine Einteilung der Anpassung in 3 Typen: Typus I, Typus II, und Typus III. 8 Versuchspersonen von Typus I verfiel sofort am Anfang der Einsperrung in Schlaf. 3 Versuchspersonen von Typus II beliebten während der ersten 2 oder 3 Stunden der Einsperrung auf und schliefen späterhin ein. Nur 1 Versuchsperson von Typus III blieb während der ersten 6 Stunden auf und schlief späterhin ein.