

MEANING AND RECOGNITION

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An experiment was conducted to ascertain the effects of meaning on recognition of stimuli by using the color-form responses as a cue in the primitive level of awareness. The recovering course from clouding following the electro-convulsive shock offered a good chance for the purpose of the present study. The subjects used were 20 mild inpatients, who had been receiving the psychiatric treatment in Shinshu University Hospital. Most of the subjects used showed a large number of form responses as the first response in recovering stage from clouding in subtests using Japanese syllabaries as a material of form. Their form responses were not only manifested by similarity of form, but closely related to the reading of syllabaries. The results showed that meaning as a member of a small group of Japanese syllabaries facilitated recognition of stimuli. If a given stimulus be supported by meaning, its stimulus would be rapidly recognized.

The effects of familiarity on recognition of stimuli have been demonstrated by many experiments. The earlier study performed by Cattell (1886) indicated that during a tachistoscopic exposure of 10 σ , the subject could easily perceive the meaningful words and words in sentences; if the words were familiar, the number perceived was larger than if the words were unfamiliar. The similar results were demonstrated by Goldscheider and Müller (1893).

Howes and Solomon (1951), and Solomon and Postman (1952) recently indicated that the recognition thresholds of words were inversely related to frequency of usage. But, frequency relates to past events, from which a present state may be inferred. More direct measures of a present state were taken in an experiment by Kristofferson (1957). He tried to determine the familiarity and meaningfulness of words and to relate these measures to recognition thresholds. His finding was that threshold was inversely varied with meaningfulness and familiarity.

In the experiment by Brown and Lenneberg (1954) investigating codability and recognizability in color, it was found that these measures were related to each other, that is, the recognition of a color was facilitated by easy coding. But, the full relationship between codability and recognizability in perception still remains to be studied.

In the previous studies testing the effects of familiarity or codability on recognition the limited time for observation was used. But, it is obviously important to investigate the effect of meaning on recognition in the primitive level of awareness, instead of using the limited time for observation.

In the present study the author wishes to find the effect of meaning on recognition using color-form response as a cue in the primitive level of awareness in recovering stage from clouding following the electro-convulsive shock.

Method

Subject: The unselected psychiatric inpatients including ten males and ten females, who had been receiving treatment in Shinshu University Hospital, served as subjects. All subjects were mild cases who could have a proper understanding of problems used, when it was administered before and after the electro-convulsive shock treatment. The number of the times of the electro-convulsive shock, which had been given to the subjects before the present experiment was begun, was less than 15 in any case. The color blind was excluded from the subject.

Procedure: The subject was laid down on a bed, and the electro-convulsive shock treatment was given to him individually. Being given the electro-convulsive shock treatment, he fell into a state of clouding in a moment. Soon after, he would begin to recover his awareness from clouding slowly. The dim and primitive level of psychological function offered a good chance for investigating the effect of meaning on recognition of stimuli. The experiment was administered at this dim and primitive level of awareness. The problems used consisted of 4 subtests, whose equivalence was about the same in difficulty one another. Each subtest was composed of three cards, which were made of cardboard (4 cm×3.6cm) with white surface and pasted with colored figures of familiar animals, birds, and Japanese syllabaries. The materials of 4 subtests are shown in Fig. 1. The upper one of the three cards is the sample figure. The lower two cards are the comparison figures, one of which is similar to the sample in form and dissimilar in color; the other is similar to the sample in color and dissimilar in form. Color papers are of Nihon Shikisai Kenkyujo (Color Institute of Japan) make, that is, red (1-14-10), yellow (7-18-6), and blue (16-14-6).

The test was administered by means of two kinds of series. The series I is the sequence of the subtest 1, 2, 3, 4, and the series II is that of the subtest 2, 1, 4, 3. The order of the series I or the series II was randomized at every subject.

The experimenter holds one colored card as a sample figure between the fingers of his right hand, and two cards as comparison figures between the fingers of his left hand so that a subject may see them the better. The instruction given to a subject is "Point to the card that looks most similar for you between this card (moving the sample card) and either of these cards (moving the comparison cards)". Of course, even if the experimenter calls the name of a subject just after the shock it has not any responsive effect on a subject. Soon after, a subject moves his face or opens his eyes a little. The experimenter starts the test. But,

a subject can not understand the meaning of the test for some time. Then some subjects give a slight nod to the experimenter's question, "Can't you understand?" Some subjects say "Well, — I can't". But, if a subject chooses a similar card to the sample card in color out of the two comparison figures, it is determined that he responds to color in visual stimuli. On the other hand, in the case of selecting a similar card to the sample card in form from the comparison figures it is determined that he responds to form in visual stimuli.

Each subtest as mentioned above was administered with unlimited time. The duration between the series I and II was more than five days.

Evaluation: The criteria evaluating the experimental results and the signs the evaluated results are as follows.

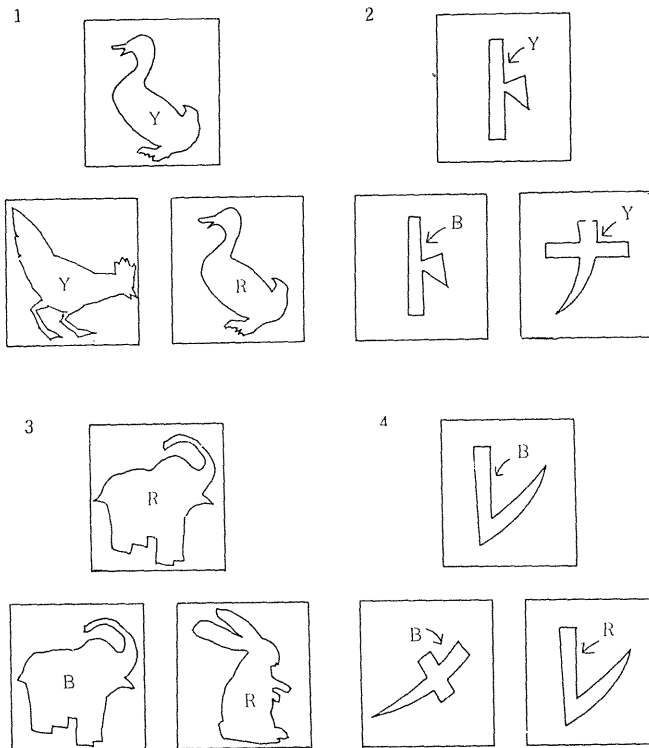
Selection on the basis of the color in visual stimuli— color response (C).

Selection on the basis of the form in visual stimuli— form response (F).

Selection on the basis of both categories of color and form—differentiated response (D).

Especially, how a form response in the series II appears compared with the series I is a matter of concern of this study.

Fig. 1 Materials of 4 subtests



※ Y, B, and R are yellow, blue, and red respectively.

Results

The results obtained in this experiment are shown in Table 1. The first response in recovering stage from clouding after the electro-convulsive shock was generally dominant in the color responses in the series I. On the other hand, in the series II the form responses were found greater than the other responses. The difference between the response trend of the series I and that of the series II was statistically significant as shown in Table 2. Especially, it is to be noted that the form responses as the first response in recovering stage from clouding in the series II are not only chosen by similarity of form, but closely related to reading of syllabaries. All but two subjects who pointed to a figure in silence read a figure as a syllabary selecting the same figure as the sample in form from the comparison figures. This is an evidence to suggest that meaning as a member of Japanese syllabaries facilitates the recognition of stimuli.

Table 1 Comparison between the series I and the series II

Sub	Sex	Age	Illness	E S	Series			
					I		II	
					Trend	Time	Trend	Time
1	♂	16	schizophrenia	1	C--F--D	16	F --- D	21
2	♂	23	"	2	C--F--D	14	F --- D	20
3	♂	24	"	10	C --- D	10	F --- D	23
4	♂	25	"	8	C--F--D	17	D	6
5	♂	25	psychogenic reaction?	6	C --- D	16	F --- D	18
6	♂	31	neurosis	6	F --- D	6	C--F--D	5
7	♂	34	schizophrenia	6	C --- D	10	F --- D	15
8	♂	38	"	7	C --- D	15	F --- D	7
9	♂	53	depression	1	C --- D	17	F --- D	14
10	♂	67	"	7	C --- D	16	C --- D	6
11	♀	16	schizophrenia	14	C--F--D	12	F --- D	12
12	♀	20	"	2	F --- D	5	F --- D	5
13	♀	21	"	3	C--F--D	27	C--F--D	23
14	♀	22	?	8	C--E--D	7	F --- D	11
15	♀	25	schizophrenia	4	C --- D	6	F --- D	14
16	♀	29	"	2	C --- D	16	F --- D	20
17	♀	32	depression	2	D	32	F --- D	8
18	♀	40	neurosis	15	C --- D	10	F --- D	12
19	♀	41	schizophrenia	6	C --- D	10	F --- D	15
20	♀	43	depression	13	C--F--D	3	F --- D	12

- ※ (1) ES shows frequency of the electro-convulsive shock.
 (2) Trend shows the course from the first response to D response.
 (3) Time shows the estimated interval from the electro-convulsive shock to the first response (in minute).

The time required for the start of the first response appearing in recovering courses of awareness from clouding after the electro-convulsive shock was shown in Table 3. The statistically significant difference was not found between the results of the series I and those of the series II.

The sexual differences on the effects of meaning on recognition of stimuli, and those on the trends of color-form responses appearing in recovering stage from cognitive disturbances were also indicated in Table 2. The statistically significant difference was not found between both sexes.

Table 2 Response trend of the series I and the series II

Series	Response trend	Sex		Total	
		Men	Women		
I	C ————— D	5	4	17	$\chi^2 = 20.689$ $P < 0.01$ $df = 2$
	C — F — D	3	4		
	C ————— F	1			
	F ————— D	1	1	2	
	D		1	1	
II	C ————— D	1		3	
	C — F — D	1	1		
	F ————— D	7	9	16	
	D	1		1	

※ Response trend shows the course from the first response to D response.

Table 3 Time required for the start of the first response (in minute)

Series	Sex	Men		Women	
		Mean	SD	Mean	SD
I		13.7	3.55	11.2	6.85
II		13.5	6.67	13.2	6.88

Discussion

This study is fundamentally related to color-form response. According to the experiment by Descoedres (1914) using the figures of familiar things the color-form response of children was dominant in form. Of course, the method used by Descoedres differs from the author's. The subject used in the present experiment is adult inpatients, not younger children.

But, as is shown in the results of the series I, the first response appearing in

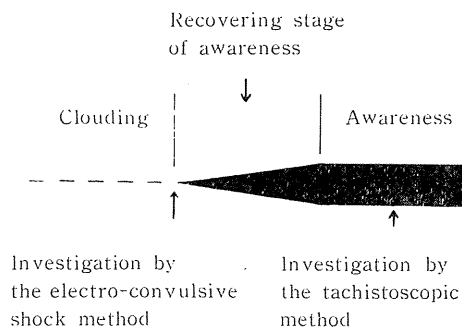
dim and primitive state of recovering stage from clouding after the electro-convulsive shock was dominant in color. Over against this, the first response obtained in the series II showed the larger score of form response than that of color response. Especially, in selecting the same figure as the sample in form from the comparison figures, most of the subjects read it as one of Japanese syllabaries. For example, the subject 17 said "I can't", in about five minutes after the shock, and then, in about six minutes after the shock he said "Ah, this is ト", "alike", selecting the same one as the sample figure in form from the comparison figures. It clearly showed that the reading of a letter and recognition of it had a close affinity with each other.

The figure as a sensual stimulus itself is one of unfamiliar codes. But, if it is transferred from one of unfamiliar codes to a code of Japanese syllabaries, it is suddenly read as a meaningful letter. In that case, the figure is no longer one of a huge group of unspecified figures. It is one of the much smaller group of Japanese syllabaries. It has a special meaning. If a given stimulus be supported by meaning, its stimulus would be rapidly and completely recognized.

Further-more, the relation between the investigation of recognition thresholds by the tachistoscopic method used in the previous studies and that of the first response appearing in the recovering courses from clouding after the electro-convulsive shock would be plainly indicated using such an illustration as Fig. 2. Thus, it seems that the present method used is a useful approach to the relation of meaning and recognition.

But, a question of course arises now. The subjects used in the present experiment were not normal in any case. It might, therefore, be considered unreasonable to try to apply the findings obtained from the abnormal subjects used to the comprehension of the relation of meaning and recognition in that condition.

Fig. 2 Illustration showing the relation between the electro-convulsive shock method and the tachistoscopic method



However, the tests used were very simple. The patients as subjects were so mild that they could easily give the definite answers to the same tests administered before the electro-convulsive shock. Therefore, it could not be doubted that the findings obtained from the present experiment would throw a light on the effect of meaning on recognition of stimuli.

References

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