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PUBLICATION TITLE: ZIRAN ZAZHI [Nature Journal]

SUBJECT TITLE: PROCESSES IN SENSING FIGURES ON CRUMPLED AND ROLLED-UP PAPER USING SPECIAL INDUCTIVE FUNCTIONS OF THE HUMAN BODY

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Young children who possess special inductive functions of the human body can recognize writing and figures on crumpled and rolled-up paper without using their eyes, but by using their ears and other parts of their bodies. This recognition mechanism is more complex and more difficult to understand than the mechanism of recognizing writing and figures on flat paper. When studying the process of sensing figures using special inductive functions of the human body, we discovered many indications that helped us to understand the mechanisms of recognizing patterns on crumpled paper. For example, when using folded paper for testing, some testees demonstrated that they sensed figures that were at first spread out flat, and then after a while they were again folded; in February of 1980, when Xiaofeng was working with the character "大" written on a crumpled piece of paper, she first sensed a curved and crooked stroked "犬," but then the crooked strokes slowly straightened out into the character "大." In order to investigate the mechanism of sensing patterns on crumpled paper, we examined separately patterns for crumpled paper by eight young children with different special inductive functions. All together 62 tests were carried out on the process of subjectively sensing figures when the paper was rolled up.

Test Results of Crumpled Paper

We cut up several sheets of approximately 4 cm^2 into different shapes and wrote characters or figures on the pieces. Then we crumpled the paper without using any special method into small balls with diameters of about 4 mm. During the tests, we randomly selected a piece of crumpled paper and placed it on the external auditory canal of a testee and asked the testee to tell us or draw out the process of subjectively sensing the characters or figures on the paper in their auditory canal. After the crumpled paper was placed in the external auditory canal, its position was not changed. The hands of the testees did not come into contact with the crumpled paper. The tests were carried out separately and each testee independently gave an account of the process of sensing the figures. Below we present the accounts of several of the testees:

Xiaoli (female, 11 years old). After the crumpled paper was placed in her external auditory canal for several minutes, she sensed the figure on the crumpled piece of paper in her brain and spread it out. After several minutes, this spread-out figure rolled up into a ball again and several minutes later this closed ball of paper appeared in her brain and repeatedly opened out. Afterwards, it closed up again. During each test, Xiaoli could open up and close the paper with the figures several times in her brain. At first it opened only partially but afterwards it gradually expanded, and then finally the figure on the entire piece of paper opened up. At the same time, each

time the figure on the paper opened up and appeared, Xiaoli could recognize part of the contents written on the crumpled paper; at first the strokes of these characters and figures were crooked, but after the paper was opened up the strokes gradually straightened out. When the paper was completely spread out, Xiaoli was able to recognize the different shapes on the paper. After the figures on the paper opened out and closed for the last time, they did not open up again after a short period of time.

Xiaopu (female, 11 years old). Her sensing process of figures on paper was similar to that of Xiaoli. Her special characteristic was that the crumpled paper opened up and closed many times. Several seconds after the paper opened up it closed, and several seconds after it closed, the paper opened up again. With this alternation of opening and closing, the time of each opening of the figure gradually lengthened. When it lengthened to more than ten seconds or several tens of seconds, the figures on the paper were completely spread out and she could recognize the characters and figures on the paper. After the final opening up of the crumpled paper, clear figures could be maintained in her brain for several minutes without closing up or disappearing.

Xiaohong (female, 13 years old). After the crumpled paper was placed in her external auditory canal, at first there appeared figures on the crumpled piece of paper, and afterwards the figures on the "loosened ball" of paper gradually opened up. Yet, as soon as the paper opened out, the figures on the paper disappeared and afterwards only independent characters and figures appeared.

Xiaofeng (female, 12 years old). The special characteristic of her sensing of figures was that there was no appearance of figures on the paper. There was only the appearance of character forms of "crooked to flattened out," such as 引 → 人 . When characters were written on colored paper, the color of the paper could appear but not the shape of the paper.

We can see from the test results of the four above-mentioned testees that the process of sensing crumpled paper is always a process in which the figures in space open up into plane figures. This type of opening-up process can be accomplished completely in one attempt, and it can also occur gradually after many repeated attempts. We also observed similar situations among other tested children. Table 1 gives some cases of the sensing of figures on crumpled paper.

Test Results of Rolled-up Samples

We used a rectangular piece of paper 1 cm wide and 6 cm long with two ends cut into different shapes. We used a color pen to write characters or symbols on the paper, rolled up the paper into a ball with a diameter of 4 mm, and then used cotton thread to bind it into a test sample. The aim of using the rolled-up sample for testing was to examine whether or not the opening process when sensing rolled-up paper was similar to that of mechanically opening a piece of rolled-up paper. Table 2 gives the results of several tests.

From the descriptions of Xiaoli and Xiaopu, when sensing characters and figures on rolled-up paper, there still occurred the process of repeated opening

Table 1. The sensing process of recognizing figures on crumpled paper.

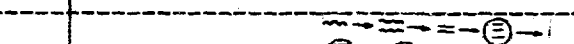
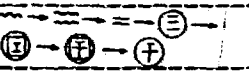
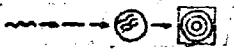
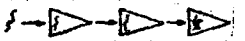
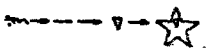
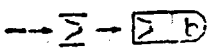
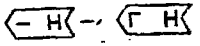
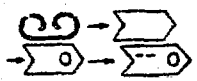
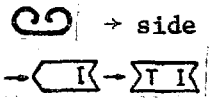
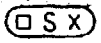
Number	Tested child	Test sample	Sensing process	The paper appears	Paper opens & closes	Test sample final figure
1	Xiaoli			Yes	Several times	Closed
2	Xiaoli			Yes	"	Closed
3	Xiaoli			Yes	Several times	Closed
4	Xiaopu			Yes	Many times	Opened
5	Xiaopu			Yes	"	Opened
6	Xiaohong		A crumpled piece of paper → the paper moves and gradually opens → the crumpled piece of paper seems to have a character → the paper disappears → *	Yes → No	One time	/
7	Xiaohong	 (white paper & blue character)	A crumpled piece of paper → the paper moves → gradual opening → crumpled paper → the paper disappears → a mass of blue → *	Yes → No	One time	/
8	Xiaofeng			No	/	/
9	Xiaofeng			No	/	/
10	Xiaofeng	 (red paper)	A strip of red → there is a back S character on top	The color of paper appears but not the shape	/	/

Table 2. The sensing process of sensing figures on rolled-up paper samples.

Number	Tested child	Sample (inside end on left, outside end on right)	Sensing process of the figure	The paper appears	The rolled-up paper opens	Final figure
1	Xiaoli	 (blue) (red)		Yes	Several times	Closed
2	Xiaoli	 (blue) (red)	 (red) (blue) (red)	Yes	Several times	Closed
3	Xiaopu	 (red) (blue)	 (blue) (red) (blue)	Yes	Many times	Opened
4	Xiaopu	 (blue) (red)	 → side or front opened (red) (blue) (red)	Yes	Many times	Opened
5	Xiaofeng	 (blue, red, blue)	S(blue) → □(blue) → there is also a little red	No	/	Appearance of symbol
6	Xiaofeng	 (red) (blue)	S(blue) → X (red)	No	/	Appearance of symbol
7	Xiaohong	 (blue, blue, red)	X(blue) → □(blue) → S (red) →  (blue, red, blue)	Yes	One time	Opened

and closing of the rolled-up paper. When the rolled-up paper was still not completely opened, sometimes "  " appeared and sometimes "  " appeared. Moreover, the figures on the rolled-up paper could rotate in the brain. The sequence of the appearance of the characters and figures on the rolled-up paper sometimes first appeared near the inside end of the pattern and sometimes appeared near the outside end of the pattern. Sometimes they also appeared in the middle of the rolled-up paper. This shows that the opening process of figures on rolled-up paper is not related to the outside end in a rolled-up paper sample, and it is also different from mechanically flattening out rolled-up paper with the hands.

After tests on recognizing crumpled and rolled-up paper samples, we further noted that the use of special inductive functions to sense samples was completely different from using the eyes to see things. One eye perceived the projection of an object in space on a certain surface but could not discriminate the projections of overlapping figures. Special inductive functions can be used to sense three-dimensional objects in space and can also carry out more complex processing. Based on the opening processes described by the testees, they are similar to the repetitive grouping of figures in space by a computer. The differences between the several testees in their sensing of figures are possibly related to the strengths of their special inductive functions. Xiaofeng and Xiaohong participated in many special inductive function tests and generally their functions were relatively strong, so that after the sample was opened once it could be clearly and completely recognized. When Xiaoli and Xiaopu participated in special inductive function tests which were conducted relatively late in the day, their functions were at an intermediate level and only after processing the samples many times could they cause the figures of the sample to advance from partially to completely open. Sometimes, Xiaoli was unable to recognize completely and clearly the test contents. After the figure of the sample closed up it did not open again, so that it was best to halt the process. This shows that the level and sustained time of opening for the sample are related possibly to the level of the special inductive function. Based on the results of using multifolded samples, as well as crumpled and rolled-up paper, to examine the sensing process of pictures by special inductive functions in the human body, this type of sensing process is not the mechanical copying of samples; but it is rather a more complex process, whereby an existing weak signal is drawn from an interference background,[1] selection for recognition is based on the number of the layer,[2] and the figures in space open up to become plane figures. Today, scientific techniques such as hologram photography, fault photography, CT, recombination of figures in space, etc., have already been realized, and an examination of the principles of these scientific techniques can perhaps help us to understand the mechanisms of special inductive functions in the human body. Moreover, special inductive functions in the human body have possibly more profound significance than these modern scientific and technological achievements.

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[1] Wang Chu, et al. Ziran Zazhi [Nature Journal], Vol. 3 (1980), p. 438.

[2] Luo Liner, et al. Ziran Zazhi, Vol. 4 (1981), p. 291.

SUBJECT TITLE: PATTERN RECOGNITION OF THE HUMAN BODY WITHOUT USING THE EYES

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Since the publication of the "Observation Report of 'Non-Visual Pattern Recognition'" in the Nature Journal [Ziran Zazhi], there have been many findings and reports published in our country. Our observation findings also confirm that some people possess the ability to recognize patterns without using their eyes. The facts prove that certain people can use many parts of their body to discriminate colors, characters, pictures, flat and folded objects, and even pictures on crumpled pieces of paper without using their eyes. Moreover, they can penetrate through paper, plastic, aluminum foil, copper foil, and various other obstructions. Because the process of sightless pattern recognition is relatively slow and because images appear in the forehead, the testee can write or orally relate the process and results of their own perceptions. Therefore, we can use the abilities of the human body itself to observe the process of sightless pattern recognition.

This article treats the sightless pattern recognition capability of the human body, including the recognition of colors and shapes of pictures, the recognition sequence, the function of position fixing and turning during recognition, the function of orientation, the function of measuring the angle, the assembling and conformity functions, the functions of study, making contact and contrast, as well as the feelings of vibration which occur during recognition.

Methods

We used various colored characters, symbols, and pictures written on white paper as the test samples. Some were studied and recognized by the testees, while others were images which the testees had never come in contact with.

1. The test sample which was fixed in direction, as well as open and flat, was stuck to the center of the palm of the testee. The testee was not permitted to move the position of the picture in his palm, and the left and right palms independently carried out sightless recognition.

2. The test sample was open and flat or folded, and it was placed directly on the palm in a random direction for sightless recognition.

3. Certain protective screens were arranged for the test sample: we used black paper wrapping; it was placed in a cardboard box with wall thickness of 1 mm and dimensions of 52 x 34 x 15 mm^2; it was placed in a black resin ink box with wall thickness of 2 mm, a diameter of 60 mm, and a height of 20 mm; it was placed in an aluminum box with wall thickess of 0.2 mm, a diameter of 68 mm, and a height of 90 mm; the test sample was rolled up and placed in a glass test tube with wall thickness of 1 mm, a diameter of 10 mm, and a height of 100 mm; the test sample was placed in the above-mentioned container in a random direction and the testee held the container in his hands for sightless recognition.

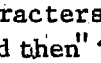
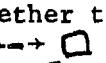
Each sensation reported by the testee during the recognition process was recorded by a tester or spoken out and written down by the testee.

Testees: A (11 years old, female), B (10 years old, male), C (7 years old, female), D (5 years old, male).

Results and Discussions

1. Observations of the Recognition Sequence

When the sightless pattern recognition functions occurred, the testee said he sensed a light screen moving on his forehead and sensed one screen after another of the figure disclosed. One screen after another appeared separately in a certain sequence, and finally he sensed the appearance of the entire figure. The results are shown in Table 1.

We can see from the observations that the process of sightless pattern recognition of the human body is a process with a certain sequence. It can divide the characters and figures into certain types of figure units, such as "-", "|", "/", "㇏", "丶", "+", "X", "3", etc. for recognition. However, it is not carried out in sequence according to the strokes of Chinese characters. Various shapes of screens are used for test samples which are flat and open, folded and rolled. After a testee recognizes the system and obtains the test sample information, he first differentiates the total contour, color, etc. of the test sample and then separately processes the separate parts of the characters. For example, "" is  , "  " is "  , and then "" is  ," "  " is "; for simple characters, the character "大" is divided into the recognition process of "人 → 一 → 大." The processes of the two accounts by testees A and B were the same for the recognition of the character "大." It is of interest that testee A seemed to enjoy searching from the protruding part of the outside towards the center and setting up logical connections. For example, "中" was "丨 → 口 → 中," "田" was "口 → 十 → 田" or "口 → 十." "王" was "工 → 王." However, testee B took even greater delight in pulling together the strokes in the same direction. For example, "口" was "  ," "中" was "三 → 川 → 日 → 中," and "  " was "  ." Moreover, the more strokes in a certain direction, the earlier the sensing occurs. We call the method of testee A the partial to imitation type and the method of testee B is called the partial to inference type.

It is very possible that the sequential sensing of sightless pattern recognition by the human body truly reflects the relative speed processes of the human brain in dividing and discriminating pattern information. The differences between the methods of testees A and B are possibly related to their sexual distinctions, individual characters, ages, educational levels, and other factors.

As regards the sensing of sequential recognition, the testees stated that when one "screen" image flashed by and they still did not clearly "see" it, they could use their thoughts to pull back the "screen" and "look" at it again. That is to say, it is controlled by one's consciousness. The sequential image sensing of the figure unit is the result of the analysis of

Table 1. Observations of the sequence of sightless pattern recognition in the human body

Testee	Screen	Test sample	Color	Folds	Main account (MA)	Results of MA
B		口	Red	3	Red 𠂇 → 乙 →	
A		田	Blue	3	Blue 口 → 十 → 𠂆 or → 田 →	
B		中	Blue	1	Blue 三 → 𠂇 → 日 →	
A		中	Blue	2	Blue 丨 → 口 →	
B		丁	Black	4	Black 一 → 丨 →	
A		上	Blue	6	Blue 丨 → 一 → 土 →	
A		王	Blue	1	Blue 工 →	
A	Aluminum box	人	Gray	1	Black	
B	Ink box	大	Red	2	Red 人 → 一 →	
A	Imitation leather	大	Gray	1	Black 人 →	
A		天	Blue	3	Blue 一 → 一 → 人 →	
A	Cardboard box	力	Blue	1	Blue 丿 → 了 →	
A		台	Blue	3	Blue 厶 → 口 →	
B	Ink box	哭	Black	1	Black 大 → 口 → 口 →	
A	Glass tube	巧	Blue	Rolled up	Blue 工 → 丂 →	
A	Cardboard box	文	Blue	1	Blue 丶 → 一 →	
B	Ink box	杓	Black	1	Black 大 → 木 → 勺 → 厶 →	
B	In a quilt with light put out	前进	Blue	1	Blue 量 → 丿 → 丶 → 月 → 刂 → 一 → 前 →	
A		上 学 去	Blue	4	Blue One strip of "three characters" with separations in between them. 丿 → 丶 → 一 → 丨 → 一 → 二 → 去 → 了 → 子 → 字 → 学 → 学 → 一 → 丨 → → → 上 →	上 学 去

Note: Where there are blanks for the screen items, the test sample was placed directly into the palm and the direction of the test sample's position was random.

the picture by the human brain, and it is also a reflection of the relative speed processes of the analysis of the figure. However, the integral display of the final results is the data and results of people's high-level central discrimination.

2. Position Fixing and Turning Functions

For figures with axial symmetry or which are non-symmetrical, we aimed them directionally in the direction of the testee's middle finger, the surface of the figure faced the center of the palm, and the left and right hand palms or clenched fists separately carried out sightless processing. Testee A was tested with 18 figures, 9 in each of her hands; testee B was tested with 6 figures, 3 in each of his hands, and he carried out repeated sampling tests. The testees said that when they "saw" the figure on the light "screen" on their foreheads, they used the middle finger as the top and the wrist as the bottom. It was the same as "seeing" the figure right in front of the forehead. When the hands were lowered or level, or when the person was standing, sitting, and lying down, there was no influence on the sensing direction of the figure. It was as if the eyes were forming in the palms of the hands, the head was pointed toward the tip of the middle finger, the feet were facing the wrists, and the face was looking toward the figure. See Fig. 1 for the results.

The results of the observations show that the sightless pattern recognition functions of the human body have directional abilities. This type of directional ability is a necessary condition of pattern recognition without using the eyes. It can be assumed that if direction finding is not possible, then it will be impossible to realize pattern recognition without using the eyes.

How does sightless pattern recognition discriminate direction?

One possibility is that if a path which has figure information transmitted in it is induced by the skin, then the relative positional direction of the skin and figure are fixed, and the skin and brain tissue also have certain corresponding relationships. That is, as regards the relationship between "induction" and "feeling," the direction of the tips of the middle fingers of the left and right hands is the same as the direction of the top of the head of the body's axis. However, when the left and right hands have inversion symmetry, the position of each spot on the hands also has an inversion symmetry relationship in the brain. This causes the figures recognized separately by the left and right hands of the testee to have the same recognition results in the brain.

This type of directional rule is possibly innate in humans. Moreover, each part of the human body possibly has correspondences between the directional axis and central axis. It was observed that when the test sample character "中" was placed in a random direction in the hand of testee "D," his account was "⊖." However, as can be seen from Table 1, when the character "中" was placed in a random direction in the hand of testee B, the recognition sequence related by testee B was "丨丨 → 二 → 日 → 中." Testee D had not yet attended school, whereas testee B had already been attending school for three years. We can explain from testee B's recognition process, which

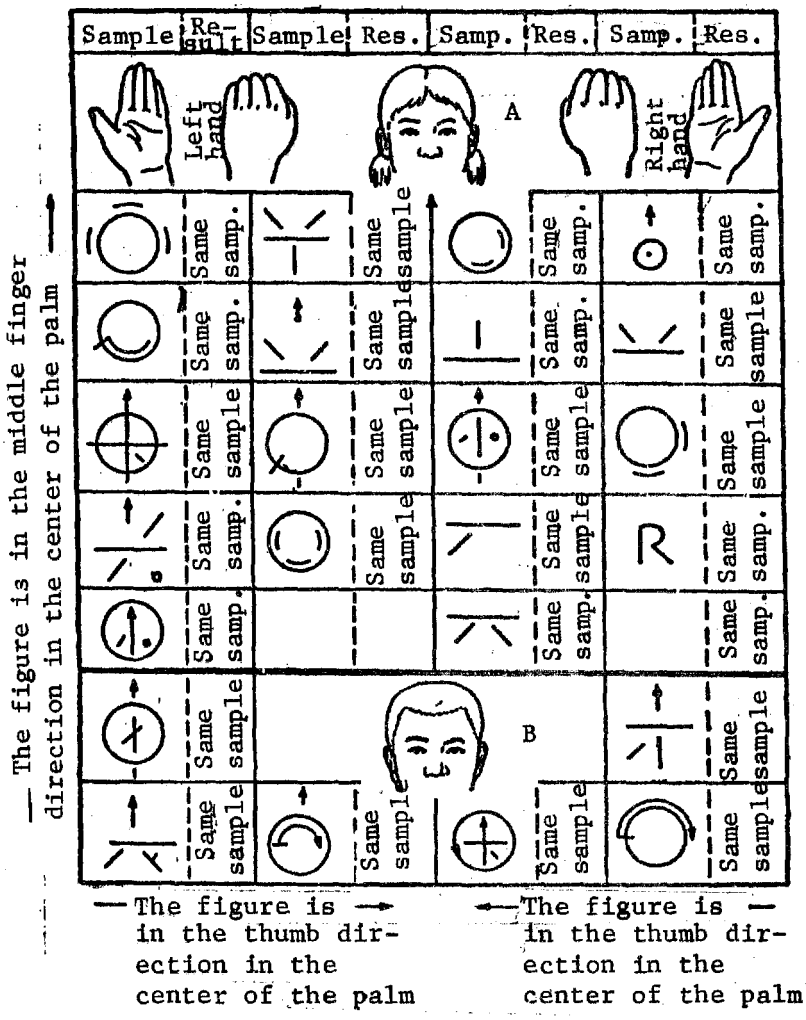


Fig. 1. Observation results of the directional functions of sightless pattern recognition of the human body.

was capable of changing "日" into "中," that: (1) when the information was being processed in the brain, testee B had the ability to rotate the figure information around the vertical axis of the center axis; (2) this type of rotational ability is possibly related to the educational level of the testee.

It was observed that in the recognition process of the character "下" by testee B: "下 → "上 → 下." This is possibly the function of still having the figure information rotate around its vertical axis on the center axis when processing the information in the brain.

For figures randomly placed in the hands, ears, and other parts of the body, as well as for figures placed in certain kinds of containers, the sightless pattern recognition capability of the human body can still accurately find and discriminate the direction. During the recognition process, the position of the sample sometimes changed, but the direction of the sample could still be found accurately. As regards samples that were folded,

rolled up, and crumpled, the testees said that they could [illegible] figure information, find the direction, and rotate it. This is another special ability of sightless pattern recognition by the human body.

3. Orientation, Angle Measurement, Assembling, and Bonding Functions

In the process of pattern recognition without using [illegible] the character information is divided into figure units [illegible] recognition sequence to obtain sense perception of the [illegible] the figure units assembled together to form a complete character pattern. According to the testee, the character "上" is divided into three parts, "丨," "一" and "⟶," and they had already used their direction-finding functions. By adding the three strokes of the direction-finding functions, the positive positional relationship between them can be arranged in many ways. If the three parts are fixed on a coordinate plane and we use the arrangement method for the Chinese character "田," then "丨" uses three positions to design 田, 田, and 田; and "三" uses the 田, 田, 田 ... all together C_9^2 types of arrangement methods, then the positional relationship of "丨" and "三" has $C_2^1 \cdot C_i^2 = 108$ types of arrangement methods. However, testee A actually first assembled it into the character "土" and only later determined that it was the character "上." This is to say that after the figure is entirely fixed in direction, each of the divided units is also fixed in direction. However, it is also necessary to fix accurately the position and eliminate the various random positions in order to be able to [illegible] them accurately.

From an analysis of the test results, after the picture information and each of its units are fixed in direction on the center axis, an original point or a figure unit is fixed on the center axis direction and a "scale" is also fixed. Then, each unit of the picture is determined on the top and bottom relative positions on the scale, and it is assembled along the center axis. In the recognition processes of "上" → "丨" → "⟶" → "上" and "田" → "口" → "十" → "[illegible]" or "田" → "田," we can see from "土" → "上" and from "[illegible]" → "田" that on the transverse axis direction perpendicular to the center axis there is relative movement between each part of the figure information. The movement of each part of the figure information on the axis is called "assembly."

The correctness of assembly is related to the size of the scale used by each part of the figure and the determined relative positions on the scale in the processing of information for each unit of the figure must be uniformly checked so as to be able to fix accurately the position and accurately assemble the figure. For example, testee B fixed the position of the character "中" and divided it into "三" → "川" → "日." At this time, the assembled "日" was uniformly checked by the scale, the image sensing of the figure information appeared in a plane, rotated 90° (or 270°) around its vertical axis, and finally the testee discriminated the character "中" from "日."

In sightless pattern recognition by the human body, picture units having a certain angle of inclination with the center axis direction, aside from the length scale, also have measuring angle position fixing functions. See Table 2 for the observation results.

Table 2. Observations of the measuring angle position fixing functions of the sightless pattern recognition by the human body

Testee	A	B	A	A	A	A	A	A	S	A
Screen	铝盒	墨盒					纸盒	黑纸	纸盆	Glass tube
Test sample	人	大	大	天	天	本	力	A	文	Rolled
Major account (MA)	↓	人↓一↓	人↓	一↓一↓人↓	一↓大↓	木↓一↓	丿↓刀	一↓丿↓乀↓	丶↓一↓	丶↓亻↓一↓乀↓
Results of MA	人	大	大	天	天	本	力	大	文	代

Key: 1 - aluminum box; 2 - ink box; 3 - cardboard box; 4 - black paper; 5 - paper tub.

We can see from Table 2 that the figure units are not parallel nor perpendicular to the center axis and transverse axis, and their sensed images often appear continuously or simultaneously. "人" → "人," "大" → "人 → 一 → "大," "天" → "一 → 一 → 人 → 天," etc., show that there are measuring angle position fixing functions in the information processing of sightless pattern information. However, if the position fixing function of the ratio of the measuring angle fixed position to length do not match well, then the error of "A" assembled into "大" can occur. It can be considered that measuring angle position fixing has a process of independent analytical processing.

As regards the recognition of circular and arched patterns, the testees said that the circular shaped images were sensed in their entireties, and the circles were always sensed before the arcs. In the recognition of circles, the phenomenon whereby there was division into separate sections of arcs which were later connected together did not occur. The observations are given in Fig. 1. For the pattern "◎," testee A said that "there are two circles and the one in the middle is black and indistinct." This shows that there is an independent process for the processing of circles and arcs in the sightless pattern recognition by the human body. This area of work still requires further observations. We can see from Table 1 that for more complex characters, such as "妳," "巧," "构," "白," "前进," "上学去," etc., the method of processing by dividing the characters into parts was used. Moreover, we can see that following the development of recognition functions, the figure units divided for recognition can change from simple to relatively complex. After the process of dividing the characters into parts, they then use uniform proportions, fixed positions, measuring angle, etc., between each divided part to form a complex character pattern.

4. Practice, Making Contact, and Contrastive Functions

We discovered in the observation process that following an increase in the number of tests on the testees, the testees said that the sightless recognition of characters was "one character at a time jumping on a light screen."

For example, this was true of later observations of "前进 [advance]," "努力学习 [study hard]," "锻炼身体 [exercise the body]," "热爱祖国 [ardently love one's country]," "保卫祖国 [protect one's country]," "持之以恒 [persevere]," "功夫不负有心人 [hard work does not shoulder strong-willed people]," etc. This shows that the sightless pattern recognition function by the human body comes into contact with data processing channels after being used many times. This is a self-organizing function, and it causes the recognition capabilities to increase from the recognition of simple figure units to the recognition of complex figure units. We call it the "making-contact function."

The testees must always check their own sightless recognition results and samples. The testees always appear very happy when there are correct sightless recognition results. This is also a process of gaining practice, so that after study and training, the speed and ability of testees to process figure information can be raised. The "making-contact function" in the sightless pattern recognition by the human body is the basis of the ability to gain practice through training. The strength of the ability to study reflects the strength of the "making-contact ability" and study can strengthen the "making-contact function."

The testees could copy out the characters on the samples which they did not know, for example, "国," "習," etc. Moreover, they could compare and even guess and determine them from what they had already studied: for example, they distinguished "哭" by saying it had one less dot "丶" than "哭" ...

[Tr. Note: last page of original text missing.]

Translated by:

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