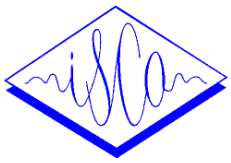

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RECOVERY MECHANISM OF NAMING DISORDERS IN APHASIC PATIENTS
- Effects of Different Training Modalities -

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ABSTRACT

Recovery mechanism of naming disorders was investigated. Two kinds of naming training methods, namely, one with Kanji writing, and the other with initial syllable phonemic cue and repetition, were administered to two aphasic patients. As a result, both the improvement rate and the stability of performance were better after the training with Kanji writing than the other method. It suggests that the improvement of the namng performance with the training of Kanji writing was activated by the information processes of writing Kanji and reading them aloud.

I. INTRODUCTION

Recovery mechanism of naming disorders was investigated based on the view that recovery process is not uniform across different modalities and that therapy must be planned according to the mechanism of each disorder.

The rate of the improvement in the short period and the stability of their performance in the long period was examined.

II. METHODS

2.1 Subjects

Case 1: Y.H. 52-year-old right-handed woman. She suffered from subaracnoidal hemmorhage more than ten years ago. We could not identify the focus of the bleeding. An AV shunt was intubated to her lateral ventricle. After the onset she had no neurological nor neuropsychological signs. In 1982 she suffered from cerebral hemmorhage. She lost consciousness during breakfast and right hemiparesis and sensory disturbances appeared. She started the physical, occupational and speech rehabilitation in 1983. She manifested aphasia and bucco-facial apraxia. But she showed no intelligence disorders nor agnosia nor other kinds of apraxia. CT findings revealed low density areas from the left putamen to the left caudate nucleus. Her language disorders was cllassified as moderate non-fluent aphasia. Her speech length was short and lacked volume and fluency. Her speech included prolonged phonemes, substitutions and self-corrections but few distortions. Though the oral naming was severely impaired, it was facilitated by the phonemic cues. Her ability of repetition and the reading aloud was better than the confrontation naming. In writing, she wrote only words but not sentences. Though Kanji was preserved better than Kana, the ability was as well as the oral naming. The ability of writing to dictation manifested better than that of written naming.

Case 2: T.O. 53-year-old right-handed man. He suffered from cerebral infarction in 1983 and was admitted to the rehabilitation hospital in 1984. His neurological and neurophychological findings revealed right hemiparesis, sensory disturbances, aphasia and bucco-facial apraxia. CT findings revealed the low density area from the left putamen to the caudate nucleus and in the frontal-parietal lobes including cortesis and

subcortesis. His language disorders manifested very similar to that of case 1. His speech showed non-fluency and the phonemic cue was sometimes effective on the oral naming. The reading aloud and repetition was preserved more than naming. Though the ability of Kanji writing was a little bit better than that of oral naming, both of those were about the same level in the unfamiliar words. In writing, writing to dictation was better than written naming. Auditory and visual language comprehension were preserved.

Both of two subjects started the training more than one year after the onset started to train following the conditions as these procedure.

2.2 Procedure:

Period 1; Two kinds of naming training methods, namely, one with Kanji writing, and the other with the initial syllable phonemic cue and repetition, were administered to the above two aphasic patients for one week.

Period 2; The above each two kinds of naming training in the reverse order, were administered one week each to the two aphasic patients.

Period 3; The percent correct of the naming prformance after the training was examined once a month over three months.

The used materials were selected from Sasanuma's, Takeda's and Kumon-shiki cards with line drawings of common objrcts.. These materials were divided into two groups, namely, trained materials and untrained materials. During the period 1 and 2, 60 materials which two subjects could not name orally nor write names three times, were divided into two trained groups and one untrained group. During the period 3, 120 words which two subjects could not name orally and write the name in Kanji nor Kana, were divided into three groups. Each 40 words were used only for one training method, namely, Kanji writing, Kana writing and repetitive naming. Naming of these words were practiced until the subjects maintained 100 percent correct for three times continuously.

III. RESULTS

During the period 1 and 2, both of the two subjects showed high performance of oral naming after a week of the training with Kanji writing only, while the correct percentage of oral naming fluctuated from day to day after the training of repetitive naming only. When the patients could not name objects orally, they wrote their names with Kanji on the desk with their fingers and then

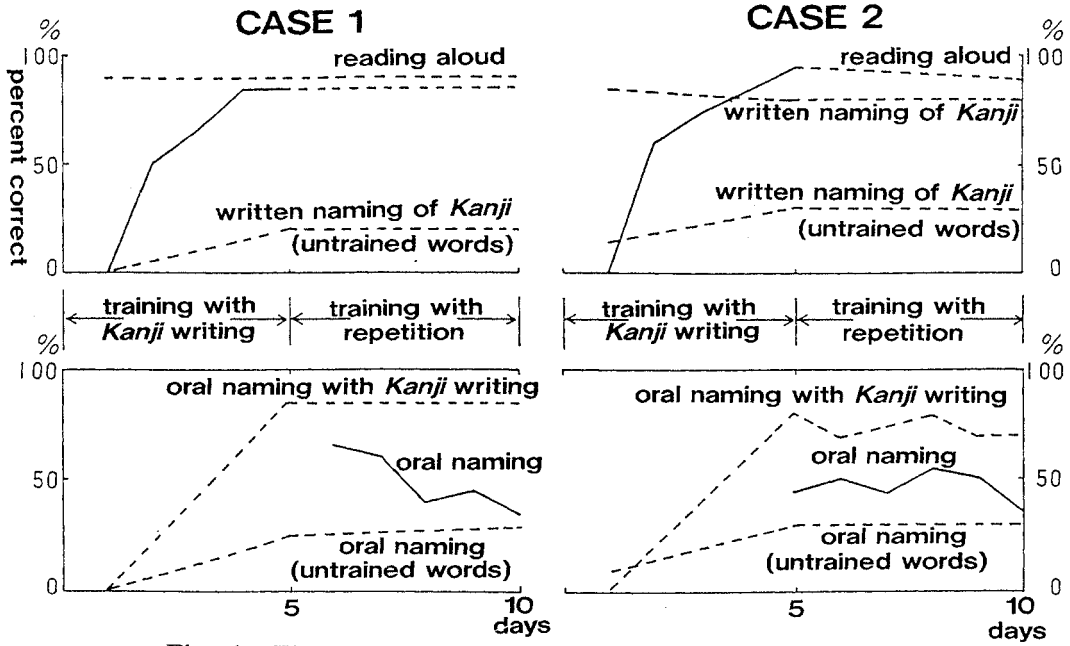

Fig. 1 The change of the percent correct in the Period 1.
a solid line: trained modality
a dotted line: untrained modality

they read aloud the traces which they wrote. Even after the training of repetitive naming, they showed high score as the same level as that of the training with Kanji writing , when they were required to write. In the Kanji writing, they maintained the high level score, though they were not trained. In Kanji reading aloud, they always showed high scores. The words which they failed to name were also those which they failed to write whether or not they could read aloud(Fig. 1).

During the period 2, as well as the period 1, oral naming and Kanji writing manifested low performance after the training with repetition. After the training with Kanji writing, both Kanji writing and oral naming showed high correct percentage. The reading aloud of Kanji always showed high correct percent. The number of movement of writing with a finger on the desk decreased than those in the period 1. In this period also,the words which they failed to name were also those which they failed to write whether or not they could read aloud.

In the untrained words, the percent correct of oral naming was not significantly changed during the period 1 and 2. Through the training periods, the training with Kanji writing showed more effective than that with repetition (Fig. 2).

During the period 3, three months after the training, naming ability was maintained up to 95% after the Kanji training, but the ability manifested below 40% after the training of repetitive naming. These differences increased gradually according to the time course (Fig. 3).

IV. DISCUSSION

The model when the dual code hypothesis(1)(2) adapted to Kanji written naming and oral naming. The route, which we call the phonological, is a process of naming as phones. The other route, which we call the visual-semantically, is a process of naming as graphemes. In a normal subject, naming information process would have two possibilities of activation routs. One is that the both of phonological and visual-semantic processes would be activated. The other is that the phonological process would mainly be activated. Concerning the written word, the phonological processes would mainly be activated and then transmit the information to the movement of writing.

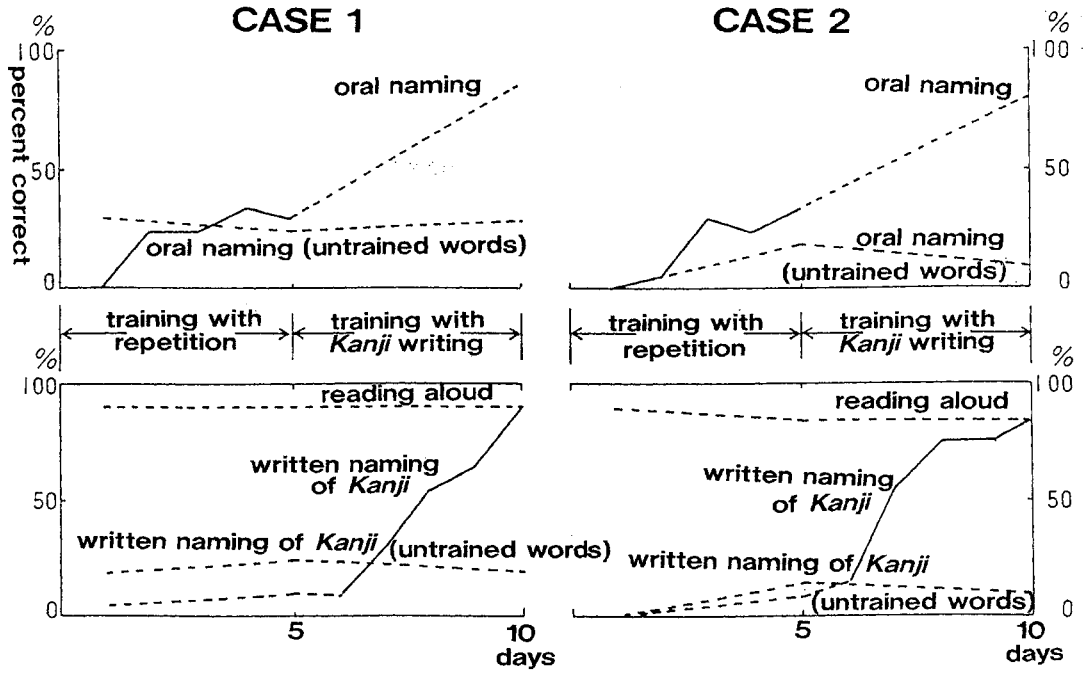

Fig. 2 The change of the percent correct in the Period 2.
a solid line: trained modality
a dotted line: untrained modality

In these cases, they wrote their names with Kanji on the desk with their fingers and then they read aloud the traces which they wrote. Though the phenomena accompanied with writing are similar to Schreibendeslesen of pure alexia, they did not repeat to write but gazed the trace. Namely, they do not need the dynamic information but the static information. Therefore we suppose that it differs from the pure alexia, because they would read the traces they wrote. In addition to the data which the performance of writing improved with that of oral naming, the improvement of oral naming is likely to explain that written words would be read aloud. The another data supported this explanation, namely, the words which they failed to name were also those which they failed to write whether or not they could read aloud.

These two cases started to train when they could not name orally nor write names, namely, both of phonological and visual-sematic information processes were not activated. After the training, only visual-semantic process activated, and the phonological process did not. In normal subjects, however the phonological processes are though to be mainly than the visual-semantic processes.

Not only the improvement rate and the stability of the performance were better after the training with Kanji writing than the training with repetition. It indicates that the strategy of using visual-semantic process are effective in the long term. Luria(3) reported that the functional reorganizations divided into intrasystematic reorganization and intersystematic reorganization. In these cases, they named with writing at first, then accompanied writing behavior decreased. Therefore the reorganization would move from intersystematic to intrasystematic reorganization.

V. LITERATURE

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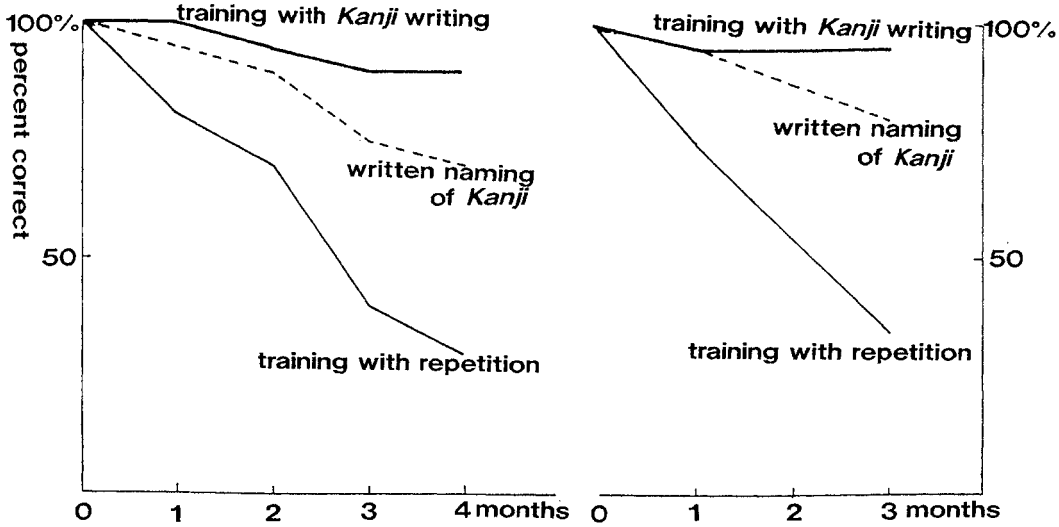

Fig. 3 The naming performance after the training (Periode 3)
a solid line: oral naming
a dotted line: written naming