Teaching Computer Operation to People with Higher Brain Dysfunction: A Case Study

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Background

People suffering from higher brain dysfunction is increasing in number for these days in Japan owing to the development of the emergency medical care system. They have great difficulty for taking part in the society or reinstating them in their previous position due to their complex symptoms. Computer operation ability may come to an important way for them to join the society and communicate with other people. We have trained a person with both unilateral neglect and attention disorder for more than a year and obtained some knowledge on how to deal with these disorder in case of using computer.

Methods

A subject of our training is a male in his fifties. He has unilateral neglect and attention disorder due to subarachnoid hemorrhage as well as left half paralysis. He can operate the computer only by his right hand. He was a quite beginner of the computer when we had started training. We have carried out training on mouse operation including clicking and dragging, text entry and folder operation. We also examined his visual perceptual ability such as perception of figures or position in the image appeared in computer display. Our method is as follows: 1) experience some operation, 2) find difficulty in the operation 3) check his ability to percept or understand the operation and 4) start with more basic level training required to execute the operation that he could not carried out before. In some cases we prepared certain stimulation in the left side of his sight to attract his attention to left half of the computer screen.

Results

1. Mouse operation training

He could recognize the relation between the moving mouse and the cursor in the screen. However he was not good at using mouse, because the area of mouse operation was limited to small region on the desk and hence the action that brings back mouse floating above the desk to transfer the cursor for long distance in the screen was never understood. Then we chose a trackball for his operation. We carried out simulation program of menu selecting operation and the time needed to finish the task was shorter for the trackball than the mouse.

2. File operation training

Graphical user interface (GUI) requires the window system and hierarchic directories in case of file operation. Overlapped windows are the objects that bother the subject with attention disorder. In addition, the unilateral neglect hinders the icons in the left half of the window. We have developed training tools that assist window recognition and help file operation.

3. Text entry training

Because the subject can use only right hand to enter the text, we employed a software keyboard on the screen. Key layout is based on the systematic table of the Japanese syllabary ("50 on") The unilateral neglect strongly affects the recognition of characters in the line. The subjects could not compare the sample text and the text which he had entered. Many errors were made in the text entry task. Therefore we prepared a special text editor to assist learning text entry.

Discussion and Conclusions

Through above trainings we could find out following problems: 1) Attention disorder caused cursor missing in the noisy background or overlapped multiple windows. 2) Unilateral neglect hindered the left half of the window and caused missing icons or menu items. One more important point is that the repetitive training could not improve the ability so much. Therefore, for the beginners having higher brain dysfunction such as unilateral neglect or attention disorder, a training tool specially designed for those people is strongly needed to learn the computer operation.