Telephone Call Aid for Problems of Visual Sequencing

(communication aid; trainable mentally handicapped)

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People with problems of visual sequencing and impaired immediate memory have difficulty placing telephone calls independently. A Call Aid, created from an inexpensive spiral-bound pad of 3 x 5 inch cards, enabled people with visual sequencing problems to make a telephone call independently. In a pre-test, post-test study, nine of ten trainable mentally handicapped adolescents, IQ range 40-55, were able to dial successfully immediately after training and 1 week later. Construction of the Call Aid is described.

The ability to use a telephone independently is a necessary skill for communication, especially for the handicapped person who is preparing to live in a halfway house or independently in the community. The ability to summon aid in an emergency is particularly important. There are many telephone adaptations for patients with problems of strength and range of motion. Also, there are sophisticated memory dialers for those who have visual perceptual problems. The adaptations supplied by the telephone company often have charges for installation and use and can be used only at the place of installation. The Telephone Call Aid is presented as an inexpensive, portable solution to enable those with visual sequencing problems to make a telephone call independently.

Review of the Literature

A review of occupational therapy textbooks and journals published since 1947 indicates that adaptations for the use of the ubiquitous multistyled telephone has not been mentioned often. Usually telephone use occurs as an item on an activities of daily living checklist (1-6). Compilations of information on adapted telephone devices emphasize the problems of patients with loss of strength, range of motion, or coordination and show devices for holding a telephone or techniques for dialing (7-13). The evaluation forms usually list the phone under communication and say, use phone, although later forms have terms such as use of receiver, dial, coins, indicating testing of more specific tasks to activate the telephone. The most recent text includes emergency telephone use (3). Only one evaluation form was found that evaluated the ability to enter entire number correctly (14).

A comprehensive monograph on the use of the telephone described the use of standard Bell equipment in meeting the needs of the disabled for telephone service.” (15, p 6) The monograph contains many adapta-
tions of equipment and methods for using the telephone. Evaluation techniques for various disabilities are presented. However, the authors state that the use of the dial, including touch-tone phones, will not be possible for those with visual perceptual problems (15).

Some people have problems with sequencing letters and numbers. They may memorize number names by rote, but they omit some items and use others more than once (16). The inability to repeat a digit span of five numbers or fewer suggests impaired immediate memory (17). The person learns to recognize letters momentarily and only when they remain in view (18). Some people develop visual mediators to help (19) such as color cues to ensure correct sequencing (20).

Only a few reports in the occupational therapy literature mention problems of visual sequencing and visual mediators related to the use of the telephone. Left indicates a method for use of the telephone by stroke patients (21) and the mentally retarded (22). She describes a color-coded dial overlay and slide to be used with a slide holder to assist those with perceptual problems. This is a patented device available by mail order (21). There are automatic dialing aids such as the Tele-rapid Automatic Dialer (12), the Card Dialer (11, 15) and Magical (11), all of which are rented from the telephone company. The telephone company's Card Dialer, with numbers on precoded cards, makes it unnecessary to read a sequence of numbers or use the dial. The cards can be coded by color or picture and, if they can be placed in the appropriate position, may be of use to the person who is unable to follow a sequence of seven numbers. The Card Dialer has a one time installation charge ($48.83) and a continuing monthly charge of $14.95 (Chicago, June 1983). The amount of anticipated use and the cost are factors to be considered when selecting equipment (15).

The use of the telephone has been a problem for the primary author's two adolescent sons who have problems with visual sequencing. They were the inspiration for the development of the inexpensive, portable Call Aid, which is made from a spiral-bound pad of 3 x 5 inch cards. To learn whether the device would be of use to similarly involved adolescents, a study was done in the winter of 1983.

**Method**

**Population.** Ten trainable mentally handicapped (TMH) students, mainstreamed in a suburban public high school (23), were the subjects. They were 18 to 21 years old with an IQ range of 40 to 55. The five boys and five girls were identified as having problems with sequencing, tracking, reversing digits, and fine motor coordination. None could dial a phone with sufficient skill to complete a call.

**Procedure.** A pre-test, post-test study design was used (24). The investigator demonstrated the use of the Call Aid to each student individually because demonstration methods have been found to be more effective than verbal methods for teaching retarded individuals (25). The classroom teacher operated the phone equipment and recorded the time with a stop watch. Demonstration time with the Call Aid ranged from 48 seconds to 5 minutes, 22 seconds. The practice time for each student ranged from 33 seconds to 5 minutes (Table 1).

At the end of the practice time, the student was tested to learn whether the number could be dialed correctly. After dialing the school phone number correctly two times independently, the student was considered to have completed the test successfully. The study was completed in 1 day. Skill maintenance was tested 1 week later.

**Results**

After the original demonstration, nine of the students were able to dial correctly by using the Call Aid. A simple percentage measure indicated 90 percent success rate. One week later, with minimal direction, all nine students were able to dial correctly, indicating skill acquisition and maintenance of the ability to use the Telephone Call Aid.

**Discussion**

The unsuccessful student had a problem in turning the cards individually and turned over two at a time. It was suggested that the cards be made thicker to enable discrimination of one card from another and...
to aid in lifting and turning each card. Another student with severe visual acuity problems was able to dial successfully. Although, in the investigator's personal experience, push-button phones are easier and quicker to use than dial equipment, only dial equipment was available in the school.

The ability to use a phone independently gives adolescents a feeling of accomplishment and freedom, enabling them to call a friend, to report an emergency, or not to feel stranded when left alone. It can also create a social outlet for those who may be confined. The Call Aid is inexpensive, approximately $1.00, portable (Figure 1), and useful with any kind of telephone equipment. A picture can be pasted to the pad to identify the person or place to be called for those who cannot read, or to distinguish multiple pads (Figure 2a). In order to avoid confusion, it is suggested that no more than two numbers be used in any one spiral-bound pad.

Summary
Most literature about telephone equipment and techniques emphasizes problems of strength, range of motion, or motor coordination. None of these solutions enable the person with visual sequencing, tracking, or memory problems to make a phone call. The Telephone Call Aid was devised and tested on ten TMH students, nine of whom completed a call independently. Instructions for making the Call Aid are included and its use described.

Directions for Making the Call Aid
Materials. One spiral-bound pad of 3 x 5 inch cards (Figure 1); 7 marking pens, different colors, including red and green; and transparent tape.

Method. For 7-digit telephone number:
1. Turn up the outside cover of the spiral-bound pad.
2. 1st digit: Measure across from the left side of the card on lower edge 2.5 inches and mark. Measure down from perforation in upper right corner 0.5 inch and mark. Draw diagonal line between two marks. Cut along diagonal line (Figure 2b).
3. 2nd digit: Measure across from left side of card on lower edge 3 inches and mark. Measure down from perforation in upper right corner 0.75 inch and mark. Draw diagonal line between two marks. Cut along diagonal line (Figure 2c).
4. 3rd digit: No cut necessary (Figure 2d).
5. 4th digit: Measure across from left side of card on lower edge 2.5 inches and mark. Measure down from perforation in upper right corner 0.75 inch and mark. Draw diagonal line between two marks. Cut along diagonal line (Figure 2e).
6. 5th digit: Measure across from left side of card on lower edge 3 inches and mark. Measure down from perforation in upper right corner 1.25 inches and mark. Draw diagonal line between two marks. Cut along diagonal line (Figure 2f).
7. 6th digit: Measure across from left side of card on lower edge 3.75 inches and mark. Measure down from perforation in upper right corner 1.75 inches and mark. Draw diagonal line between two marks. Cut along diagonal line (Figure 2g).
8. 7th digit: No cut necessary (Figure 2h).
To make a call, the appropriate pad of the pad. Another picture can be provided over the totally closed pad and be started, and the last number be colored red to indicate stop.

The edges of the diagonal cuts are bound with several layers of transparent tape. This makes the edges stronger and facilitates lifting and turning over only one card, which is important for those that lack fine motor coordination.

The spiral pad can be used for two telephone numbers by turning over the totally closed pad and beginning the process from that side of the pad. Another picture can be used to identify that number.

Directions for Use
To make a call, the appropriate pad is selected and placed by the phone (Figure 3). The cover is turned up.

The phone receiver is removed from the phone and the number shown on the first card on the pad is dialed or pushed. The next card is turned over and the number on it is dialed or pushed. These steps are repeated until the end of the pad is reached when the red number has been dialed or pushed. The individual will have from 20 to 30 seconds to dial seven digits. (Information on time allowed to dial seven digits can be obtained from the telephone company.)

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