

## **Tracking as a Communication Enhancement Strategy With Nursing Home Residents**

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The feasibility of using the continuous discourse tracking procedure with elderly residents of skilled nursing facilities was investigated. Of the 10 mildly to severely hearing-impaired subjects who participated, all were able to perform the tracking task through speechreading-with-listening, but only 5 completed 5 or more sessions. Tracking rates ranged from 7 to 77 words-per-minute for the group. Factors of health, motivation, and personality affected length of participation. Criteria for selection of materials appropriate for tracking for this population are needed.

While there appears to be a great need for aural rehabilitation services among the elderly, there is a widespread impression that senescent individuals are generally poor candidates for these services (McCarthy, 1987; Schow, 1982). This is especially so for nursing home residents, yet, relatively little research has been conducted to document the effectiveness of various intervention techniques with the nursing home population (Chapey, Lubinski, Salzburg, & Chapey, 1979; Greene, Hesselblad, & Cohen, 1985). In the present study we investigated the feasibility of using the continuous discourse tracking procedure described by De Filippo and Scott (1978) to improve the communication abilities of nursing home residents.

Tracking is a process in which a subject (receiver) repeats groups of words that are read by another person (talker). When errors occur in the repetition of the material, the talker and receiver employ various strategies to resolve the blockage in order to obtain a correct verbatim repetition. It can be performed through listening, lipreading, or combined modes. While scoring is accom-

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plished by calculating the number of words correctly repeated per minute, the rate may be influenced by such factors as talker skills and the type of material tracked (De Filippo & Scott, 1978).

Tracking would appear to be an ideal intervention technique for nursing home residents because the procedure is self-paced, provides a synthetic approach to therapy, allows instant feedback, and offers an opportunity for successful performance on the part of the subject when a failsafe technique, such as writing, is included. In addition, the difficulty of the material, which is meaningful speech, can be tailored to the ability level and interests of the subjects.

## METHOD

### Subjects

Subjects for this study were 10 hearing-impaired nursing home residents from skilled nursing facilities in Akron, OH, and Gainesville, FL. Subjects were selected for participation based on their hearing status and their willingness to participate.

There were 8 females and 2 males who ranged in age from 60 years to 96 years with a mean of 82 years. Their length of stay in the nursing homes ranged from as many as 20 years to as few as 1 year with a 5-year mean length of stay. All subjects had better-ear pure tone averages (PTAs) of 35 dB HL (ANSI, 1969) or greater, as determined through pure tone screenings. Hearing aids were worn by six of the subjects. The hearing aids had been fit prior to this study and their functioning was monitored before each session.

### Procedures

Visual status was screened with the Titmus Vision Tester and mental status was screened with the Short Portable Mental Status Questionnaire (SPMSQ) which was described by Pfeiffer (1975). The Nursing Home Hearing Handicap Index (NHHI, Schow & Nerbonne, 1977) was completed for each subject prior to tracking by a staff member who was familiar with the subject. The "Self" version of the NHHI was also administered to the subjects using an interview format.

After subjects demonstrated that they were able to track, which was defined as successful performance on a practice paragraph, each subject received a pretraining tracking test. They then received a series of short stories to track, followed by a posttest. All materials were presented audio-visually. Subjects who had hearing aids wore them.

Testing was done either in the subject's room or in unoccupied multipurpose rooms. In all cases, ambient noise was kept to a minimum and lighting was arranged so that the talker's face was illuminated. The talkers were graduate students in audiology.

The testing and training materials were 12 stories from *Reader's Digest* that

had been tested in a pilot study with two normally-hearing college students. The stories were presented to the subjects as an audio-visual task. The subjects were tested individually as they sat in a sound booth while the talker presented the stories over an audiometer at 5 dB SL from the other side of the booth. The talker's face seen through an adjoining window was illuminated with a 100 watt incandescent light during presentation of the material. The presentation order of the stories was counterbalanced across subjects.

Based on the results of this preliminary testing, the stories were ranked from easiest to most difficult and were then presented to the nursing home subjects in this order. The materials used for the pre- and posttests were two stories that were found to be of equal, intermediate difficulty in the preliminary testing.

At each meeting, subjects tracked for 15 minutes, or until a story was completed, or until they asked to stop. If a story was not completed within the 15-minute time period, the talkers offered to finish reading the story. Testing and training were completed within a 10-week period and the posttest was administered in the session immediately following the last training session. Typically, 2 sessions were scheduled per week.

## RESULTS

The number of tracking sessions completed by each subject as well as subject data are shown in Table 1. Of the 10 subjects, 5 subjects completed 5 or more tracking sessions. The others, S6-S10, did not participate long enough to collect sufficient data for analysis, so no further comment on their scores will be made here. S1, S2, and S4 completed fewer than the total possible 10 training sessions because of schedule conflicts with the talkers. Consequently, the subjects were run for as many sessions as possible and were then tested on the posttest during their final session.

The pre- and posttracking rates of S1-S5 are shown in Table 2 with the scores expressed as the average words per minute (WPM) tracked in each of the sessions. The data indicate that nursing home residents are able to track. Two subjects tracked at a faster rate on the posttest, one showed no difference in performance between the pre- and posttests, while two subjects tracked at a slower rate on the posttest. The following case studies provide information about individual responses to the tracking experiences.

### Case 1

This 82-year-old female had been a nursing home resident for 2 years. She was a very sociable individual who scored in the mentally intact range on the SPMSQ and took six drugs primarily for severe back pain due to osteoporosis. Her self-estimated NHHI score of 30% was very similar to the staff-estimated score of 32%. (Higher scores on the NHHI indicate greater handicap.) Her corrected vision was 20/50 and she did not wear a hearing aid as she had

**Table 1**  
Subject Data Summary

| Subject | Sex | Age (Yrs) | Better Ear PTA <sup>a</sup> (dB HL) | NHHI <sup>b</sup> - Self | NHHI <sup>b</sup> - Staff | Medications | Sessions Completed |
|---------|-----|-----------|-------------------------------------|--------------------------|---------------------------|-------------|--------------------|
| 1       | F   | 82        | 37 dB                               | 30                       | 32                        | 6           | 5                  |
| 2       | F   | 83        | 75 dB                               | 22                       | 75                        | 15          | 7                  |
| 3       | M   | 83        | 63 dB                               | 80                       | 67                        | 10          | 10                 |
| 4       | F   | 84        | 38 dB                               | 75                       | 72                        | 10          | 8                  |
| 5       | F   | 60        | 38 dB                               | 25                       | 22                        | 3           | 10                 |
| 6       | M   | 78        | 43 dB                               | 50                       | 20                        | 5           | 1                  |
| 7       | F   | 84        | DNT                                 | 30                       | 62                        | 1           | 2                  |
| 8       | F   | 82        | 40 dB                               | 30                       | 70                        | 8           | 1                  |
| 9       | F   | 94        | 40 dB                               | 37                       | DNT                       | 9           | 2                  |
| 10      | F   | 96        | 70 dB                               | 80                       | 92                        | 3           | 1                  |

<sup>a</sup>Pure tone average for 500, 1000, and 2000 Hz.

<sup>b</sup>Nursing Home Hearing Handicap Index. Maximum score = 100%, with higher scores indicating greater handicap.

**Table 2**  
Tracking Rate in Words Per Minute on a Pretest and Posttest for Subjects Who Completed Five or More Sessions

| Subject | Pretest | Posttest |
|---------|---------|----------|
| 1       | 47.1    | 59.3     |
| 2       | 38.0    | 43.0     |
| 3       | 7.0     | 7.0      |
| 4       | 53.6    | 52.0     |
| 5       | 61.4    | 58.9     |

only a mild hearing loss.

This patient's performance is shown in Figure 1. Despite the fact that she was in pain due to her back problems at the time of the posttest, her WPM tracking rate was faster on the posttest compared to the pretest. Sessions 1 and 5 indicate potential for efficient communication.

### Case 2

This 83-year-old female had been a nursing home resident for 3 years. Results of the SPMSQ indicated a moderate intellectual impairment. In fact, in addition to having various coronary problems, diabetes, and carcinoma of the bladder, this subject was diagnosed as having organic brain syndrome. Because of her medical problems, she took 15 different drugs including such medications as sedatives, antipsychotics, and antihistamines. Her better-ear PTA was 75 dB HL and she consistently wore a hearing aid. There is a dis-

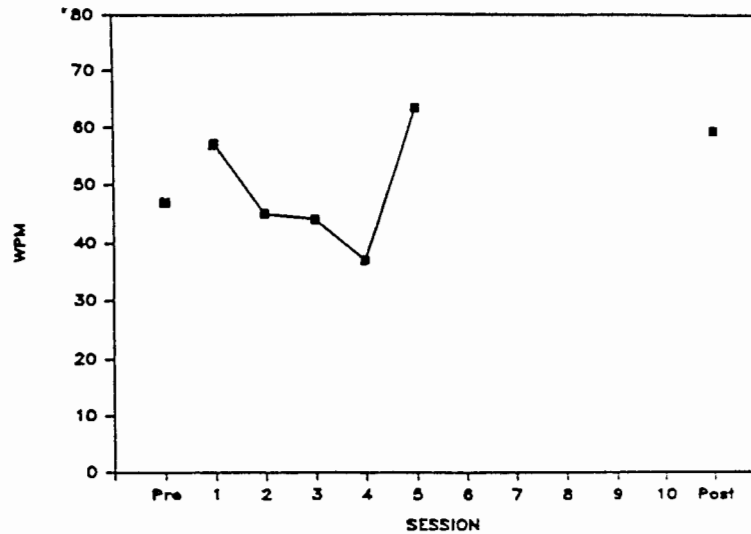


Figure 1. Tracking rate in words per minute for Subject 1 who participated in 5 sessions.

crepancy between her self-reported NHHI handicap score of 22% and the staff-estimated handicap of 72%, indicating that the staff considered her to be more handicapped than she did.

Despite her medical problems, mental status, and use of medications, this subject was not only able to track but she demonstrated an improvement on the posttest. The vocabulary of the *Reader's Digest* materials appeared to be inappropriate for this woman; consequently, stories with simpler vocabulary and syntax were substituted after the first three sessions. Tracking rates, which are shown in Figure 2, then tended to increase over sessions 3-7. Fluctuations in her tracking rate may have occurred in part due to her health status.

### Case 3

This 83-year-old male had been in the nursing home for 2 years. Among other medical problems, he had been diagnosed as having had a series of small strokes and results of the SPMSQ indicated mild intellectual impairment. With a better-ear PTA of 63 dB HL, he estimated his hearing handicap at 80% while the staff estimate was 67%. He was aided unilaterally and wore the aid regularly; however, corrected vision was only 20/100.

This individual enjoyed attention and he also loved to talk which is evident in tracking rates which hovered around the 7 WPM rate. These are shown in Figure 3. This slow rate is attributable to his frequent talking spells that were interspersed with his tracking responses. Despite his slow rate of tracking, he did indicate that he loved tracking and he enjoyed the *Reader's Digest*

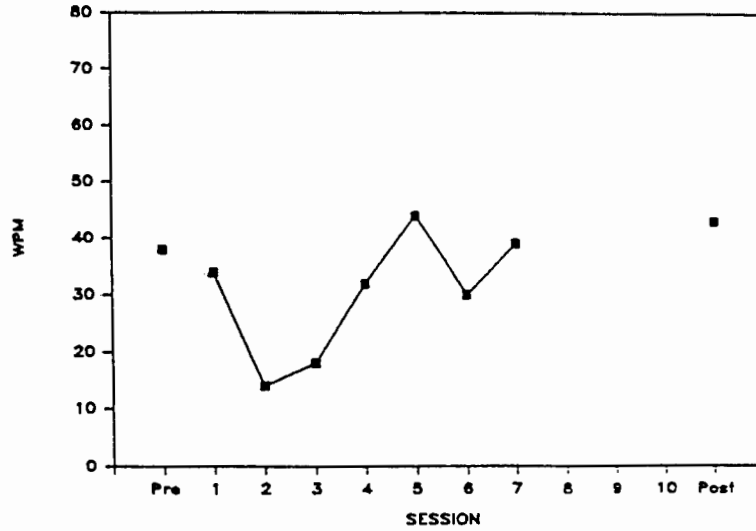


Figure 2. Tracking rate in words per minute for Subject 2 who participated in 7 sessions.

materials.

The WPM rate stayed relatively constant over the 10 sessions. Since the difficulty of the tracking materials increased with successive stories, and tracking speed was maintained, then an improvement in tracking ability can be inferred.

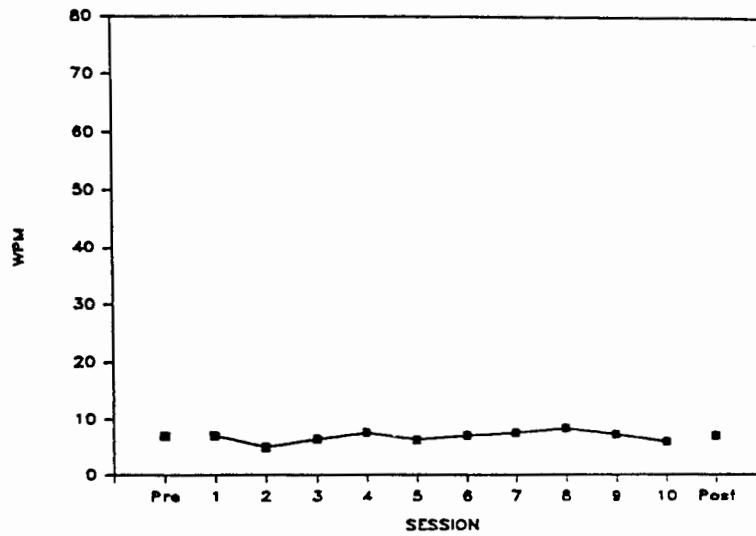


Figure 3. Tracking rate in words per minute for Subject 3 who participated in 10 sessions.

**Case 4**

This 84-year-old female had been in the nursing home for 2 years. She regularly took 10 different drugs, and results of the SPMSQ indicated that she had a mild intellectual impairment. She had been diagnosed as having senile dementia. With a better-ear PTA of 38 dB HL, her self-estimated handicap on the NHHI of 75% was very similar to the staff-estimated handicap of 72%. She wore two hearing aids all day long and had corrected vision of 20/50.

Tracking results are shown in Figure 4. While the posttest score was 1.6 WPM slower than the pretest score, examination of her tracking data suggests that there may have been some improvement in WPM rates. She was able to maintain a faster rate in the second half compared to the first half despite the increase in material difficulty.

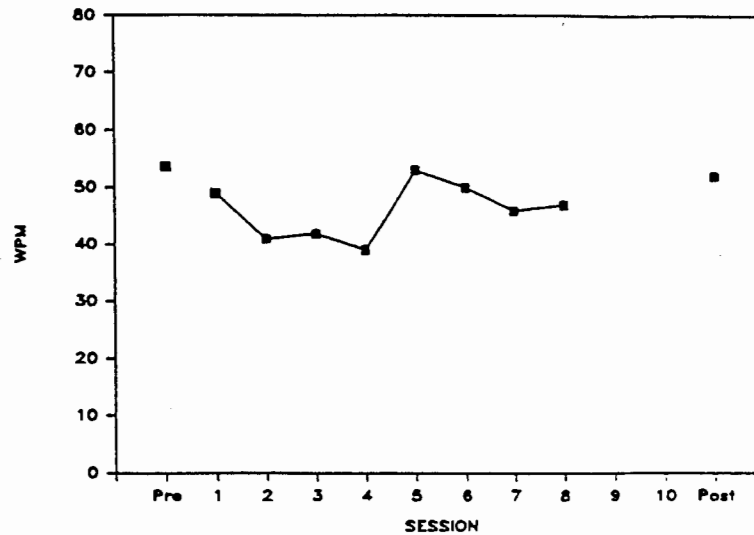


Figure 4. Tracking rate in words per minute for Subject 4 who participated in 8 sessions.

**Case 5**

This subject was a 60-year-old female who had been a nursing home resident for the past 20 years due to arthritis and multiple contractures. She scored in the intact range of the SPMSQ and took only three different medications. With a PTA in the better ear of 38 dB HL, she wore an aid on an inconsistent basis. Her self-reported NHHI score of 25% was very similar to the staff-estimated score of 22%. Her visual acuity was measured at 20/100.

Her tracking data are shown in Figure 5. Although she actually performed at a slower WPM rate on the posttest and there is a slowing of her tracking

rates during sessions 6 and 7, these slower rates seemed to be associated with days on which she reported feeling ill.

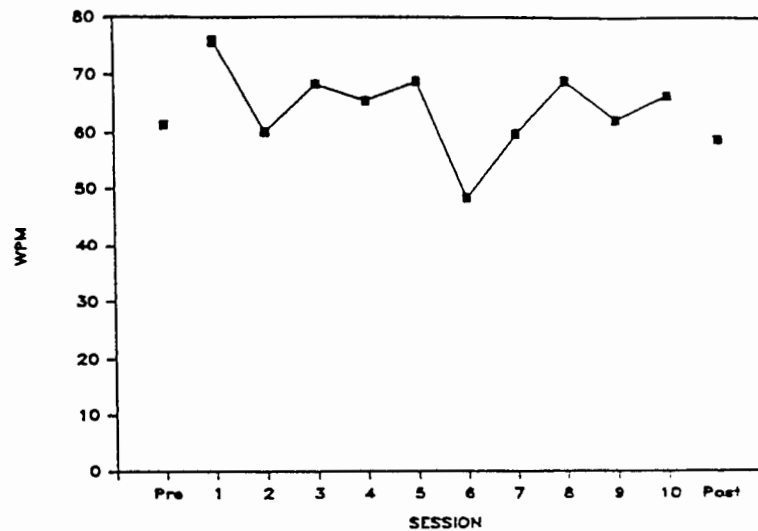


Figure 5. Tracking rate in words per minute for Subject 5 who participated in 10 sessions.

## DISCUSSION

The data suggest that tracking is a feasible intervention strategy, at least for some nursing home residents. Individuals who were successful at tracking ranged in their hearing and visual status and also in their mental status. For example, Subject 2 was diagnosed as having organic brain syndrome and she scored in the moderate intellectual impairment category of the SPMSQ; yet, she was able to track successfully.

There were, though, only 5 out of the 10 subjects who completed five or more sessions. In addition, these subjects had all been originally selected for participation based on their apparent ability to do the tracking task and their apparent willingness to participate. Several problems arose that can be attributed to the characteristics of nursing home patients as well as some methodological problems associated with the tracking procedure itself.

One of the major obstacles to providing tracking in nursing homes is the health status of the residents. According to the United States Senate Subcommittee on Long Term Care (1974), the typical nursing home resident has four or more chronic illnesses and takes four or five medications on a daily basis. On the average, our subjects were taking seven medications and they were diagnosed as having four chronic illnesses.

Health status appeared to be a major factor in determining whether sub-



jects completed the sessions or not. Of the five subjects who did not complete the study, three were hospitalized during the course of the training. Following hospitalization, these patients either refused further participation or, at most, they tracked for one additional session and then refused to go on.

Another major factor was that of motivation. Before beginning this study, it was reasoned that tracking would appeal to the residents in part because it would offer them an opportunity to interact with younger people and it would offer them a chance to talk to someone. The residents did appear to enjoy talking with the presenters; however, several of the individuals who ultimately refused to track were more interested in talking than in tracking. They would talk with animation until it was time to track, and then they would either indicate that they were "sick" or "too tired".

Activities such as Easter egg coloring, accordion concerts, bingo, soap operas, and foster grandparenting usually took precedence over tracking. For that matter, even if an activity was scheduled to occur several hours after a tracking session, residents would often either refuse to participate because they needed to get ready for the activity, or they tracked while they were clearly preoccupied with thoughts of the activity.

Finally, personality was another variable that determined perseverance. The two individuals who failed to complete more than five sessions and who were not hospitalized just refused to participate after the first few sessions. Both individuals appeared to be inflexible and unsociable. This impression was also confirmed by the nursing home staff.

There are several methodological questions that remain concerning the tracking procedure. Of particular concern is the issue of the materials to be used for training and for evaluation. The optimum type, length, and linguistic difficulty of tracking materials is yet to be determined. When an uninteresting set of materials was presented or when the materials were too linguistically complex for an individual, tracking rate was reduced. Perhaps more importantly, frustration and fatigue tended to result. Occasionally the residents refused to continue participation.

Criteria for determining when to terminate or extend treatment should take into consideration continued interest of the participants. In this study, relatively few tracking sessions were completed. At least four subjects would have continued participation willingly. More information is needed, therefore, about the number of sessions required for subjects to reach their maximum tracking rates.

In conclusion, the continuous discourse tracking procedure is feasible with some nursing home residents, though problems include subject selection criteria, health, and motivation. Future research should be directed toward determining whether changes in tracking rate transfer to improved communication outside of the therapy situation.

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