The Use of Aphasia Treatment Techniques in Restoring Language Behavior in the Senile Aged

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Forrest H. Braack
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IN RESTORING LANGUAGE BEHAVIOR IN THE SENILE AGED.

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INTRODUCTION

At present, over 900,000 disabled and chronically ill older persons reside in nursing homes (Tiven, 1971). Population growth, increased longevity, increasing incidence of chronic disease, and increasing urbanization and horizontal mobility have resulted in a growing demand for nursing homes, but despite rapid growth in recent years, heavy demand is likely to continue indefinitely (U.S. Dept. of Health, Education, and Welfare, 1971). This demand is further increased by the trend to reduce aged populations in mental hospitals by transferring them to nursing homes and family care units.

A major problem for nursing homes, as well as other institutional settings for older people is "senility". Estimates report that senile aged comprise about 60% of the residents and patients within the homes for the aged, the hospitals for the aged, and nursing homes (National Center for Health Statistics, 1963). Most facilities are not equipped to attack the problem of senility. This is not to say that there are no treatments for senility. Several have been used. Some approaches have had questionable results. Some have been too complex for nursing homes to carry out. Others have attempted a "shotgun" approach that seems effective. Just which elements are effective, however, is not known. The result is an approach with many
facets which is complex and cumbersome to carry out. What
is needed is a relatively simple, yet effective, way of
treating senility.

Senility Defined

Before anything further is discussed a definition of
senility is required. This, however, is not an easy task.
There are a multitude of definitions. Lissitz(1969) de-
defines senility as a continuum from coherent to incoherent
disintegration. It involves five processes:

(1) the interlocking of debilitation
    and depletion with the disintegra-
    tion of the mental processes;
(2) the serious decline and depletion
    of the abilities of language and
    communication;
(3) the decline and loss of the ego,
    demonstrated by the desocializa-
    tion and withdrawal from inter-
    personal relationships;
(4) the increasing inability to per-
    form the activities of daily
    living because of incoherency
    and loss of ego;
(5) the rise of illusions, delusions,
    and hallucinations in many of the
    senile aged is accompanied by an
    inability to relate to people and
    to environment.

Webster's Dictionary(1963) defines senility as the phy-
sical and mental infirmity of old age.

The definitions for senile dementia are no better.
Coleman(1972) defines it as a form of psychosis caused
in part by deteriorative brain changes due to aging.
Noyes and Kolb(1963) state that the characteristics of
senile dementia are: decreased impressionability, impair-
ed registration, declining interest in the environment, and loss of memory for recent events. The latter, by the way, is the one that serves as the earliest criterion for diagnosis. It has also been defined as the psychotic disorders in elderly people, who tend to show a progressive decline in mental functioning. This is associated with changes in the brain, primarily the dissolution of brain cells themselves (Butler and Lewis, 1977).

The term senility and senile dementia to a lesser extent are particularly ill-defined terms. They seem to have little or no scientific meaning (Carp, 1969).

It thus seems reasonable to venture a different definition and explanation for senility. Senility appears to be behavioral deficits associated with old age. The young may have the same behavioral deficits, but they are attributed to other variables. For example, when a young person has trouble with his memory, it is often attributed to being busy or just having a bad memory. When an older person shows a memory deficit, it is taken as evidence of senility. Furthermore, the labeling of a person as senile is directly related to the degree that these behavioral deficits are not identified as sensory or motor defects. For instance, an older person who cannot see well is shown a card and cannot correctly identify it. This is called a sight problem. Another older person who can see well is shown a card and cannot identify it. This
Etiology

What then causes senility or these behavioral deficits which are not identified as sensory or motor in nature? One group of theorists believe that these deficits are a direct result of brain damage. They cite a variety of "facts" to support this belief. First, at age 65 the brain is only 55% the weight of a healthy young adult (Noyes and Kolb, 1963). Second, there is a large reduction in the number of neural cells (Bertolini, 1969; Noyes and Kolb, 1963; Terry and Wisniewski, 1970). This, however, is always determined by post mortem examination and there has been consistent failure to link these physical changes to ante mortem behavior. Third, senile plaques, which are correlated with senile dementia, increase with age (Corsellis, 1962; Terry and Wisniewski, 1970; Roth, Tomlinson, and Blessed, 1966). Fourth, at least 33% develop abnormal electroencephalographic recordings over the anterior temporal area of the cerebral cortex (Busse and Obrist, 1965). In general, there appears to be widespread generalized damage to the cerebral cortex as a person ages. Again, however, there has been consistent failure to link these physical changes to behavior.

Another group of theorists feel these behavioral deficits associated with old age are not organic, but instead are functional in nature. That is, the deficits are not due to physical causes, but other often environmental variables
Others have pointed out that most of the clinically disabling behaviors of elderly persons may be viewed as operants. An operant is defined as any behavior that is strengthened, maintained, or weakened by the events which contingently follow it. The operant approach does not represent one discipline or type of therapy; rather, it is a set of techniques for describing and modifying behavior. Emphasis is placed on the analysis of functional relationships between current environmental events and behavior (Hoyer, Mishara, and Riebel, 1975; Hoyer, 1973).

A great deal of research supports the presence of environmental variables in behavior problems associated with older people. Volpe and Kastenbaum (1967) worked with severely disturbed older individuals. They provided a record-player, a decorated bulletin board, games and cards, dressed patients in white shirts and ties, and served beer and crackers each day. Amounts of medication dropped, incontinence and jacket restraints were also greatly reduced. Other researchers have shown that improved social functioning resulted in marked improvement in mental orientation (Becker and Cesar, 1973; Chein, 1971). Increased stimulation, social praise, beer, integration of ages, and other variables resulted in improved behavior patterns for older adults (Cautela, 1969; Dubey, 1968; Filer and O'Connell, 1962; Loew and Silverstone, 1971).
MacDonald and Butler, 1974).

In general, what has happened is that as the expectancy of what older people are capable of doing increases, more "normal" behaviors occur and are reinforced. If such great changes as have been demonstrated can be brought about so quickly by relatively simple changes in the environment, then it is clear that the traditional concepts of what is involved in senility may be seriously questioned (Ullman and Krasner, 1975).

Finally, it must be pointed out that there is no clear cut relationship between the pathological anatomy of brains and senile behavior. Rothchild (1945) felt that senile psychosis could not be directly attributable to damaged brain tissue, but to "the person's capacity to compensate for the damage." Other researchers using autopsy reports and observations prior to death noted that a person could manifest large behavioral deficits, yet show only mild organic damage and vice versa (Ehrenberg and Gullingsrud, 1955; Gallinek, 1948). Still other researchers using similar techniques showed that brain damage was much more frequent in normal individuals than had been thought. They also concluded that there was no significant correlation between brain damage and behavior (Gal, 1959; Raskin and Ehrenberg, 1956).

From the evidence available, it seems clear that "senility" results from an interaction of both social and
physiological variables. Just what the weighting is, is not clear. One must, however, realize that nonphysiological variables play a much larger part than has been believed.

**Treatment**

A tragic process seems to be at work with some older adults. The older person sustains some loss of function, due to a deteriorating environment and possibly brain damage. This loss of function may take many forms, one form is the partial loss of language. In younger persons such loss would generally be followed by intensive intervention to reinstate full language function. With the older adult, however, the loss of function often results in an increasingly impoverished environment such as confinement in a nursing home or mental hospital. Here, even further environmental deterioration occurs resulting in a further loss of function.

This process is not inevitable and much research has shown that treatment of senility is possible and often at least partially successful. Probably the most well-known treatment approach is reality orientation. This approach emphasizes teaching the older adult his name, time of day, day of week, the date, next meal, time of bath, where the person is (place) and other such information. It involves the entire staff—janitors, nurses, cooks, nurse's aides, and administrators. The staff repeatedly ask the older adult to verbalize his name, the date, place, and time.
Formal classes are held to teach these things and bulletin boards give the same information (Baker and Smith, 1970; Folsom, 1968; Stephens, 1969; and Taulbee and Folsom, 1966). It should also be pointed out that in practice, correct responses are often followed by some type of reinforcement such as verbal praise, a smile, a cigarette, or the like. Thus, in this approach the verbal behavior of the older person can be viewed as an operant strengthened by the praise, etc. that contingently follows the appropriate response.

Remotivation therapy often is used in conjunction with reality orientation. This treatment approach involves the stimulation of the person to think and discuss topics associated with the real world. This real world often consists of the world of work. The older person is brought into contact with a variety of people and the jobs they perform, often via motion pictures or books. The approach also assists the person to relate and communicate with other people. Remotivation is performed in a group setting with 5 to 12 people (Barnes, Sack, and Shore, 1973; Robinson nd). The approach has been compared and found similar to behavior therapies. For instance, remotivation therapists are observed to reward people for attending meetings and reinforce members for participating. The therapist also prompts desired responses, rewarding those that are appropriate and extinguishing those that are in-
Remotivation and reality orientation appear to hold promise in the treatment of behavioral disorders associated with old age. They both, however, lack some important elements. First, those using the therapies need to know what behaviors to reinforce and how to do so. Second, they need to become aware of what reinforcers are effective for increasing desirable behaviors. Third, these therapists must learn how to make direct behavioral observations rather than interpretations (Toepfer, Bicknell, and Shaw, 1974).

Another approach that has been used in dealing with behavior deficits associated with old age is the "shotgun" approach. In this approach, many aspects are incorporated in the hopes that one or all will have a positive effect on the older adults. Such aspects have included providing a record-player, decorating bulletin boards, having games, cards and television, dressing patients in white shirts and ties, and serving beer (Volpe and Kastenbaum, 1967). In another approach, walls were painted, personal space was enlarged by eliminating some of the beds, a dayroom was created, large print calendars were put up, clocks were installed, and colors and signs were used to decorate and designate area usage. They established an occupational therapy section which consisted mainly of arts and crafts. Recreation therapy was introduced. This included parties,
card playing, puzzles, indoor games, ball games, picnics, walks, film strips, trips to places of interest, dances, and an attempt to integrate the sexes. Work therapy was also introduced into this unit. There was dining room work, off ward assignments, chores on the ward, watering plants, discarding old magazines, setting up chairs for meetings, planting and weeding flower beds, and cleaning walks. Supportive type individual therapy was conducted. Another change was the inclusion of ward therapy. Here, ward management, personal problems, and other subjects were discussed. Also, at this meeting, news was summarized by one of the patients, news headlines were posted on a bulletin board and film strips were used to interest the patients. Other changes included holding an openhouse, visits to nursing homes and family care units, and a large public relations program via television, radio, and the press (Dubey, 1968).

Data from "shotgun" approaches are often given in terms of discharge rates, medication consumed, jacket restraint time, or general overall improvement. Such data are often misleading. It appears that something has been done, but just what was accomplished and what factors produced these changes is not known. It also must be noted that there is considerable effort and expense involved in this type of approach.

Still another approach which has been used to deal
with behavior deficits associated with old age is behavior therapy. Most research in this area has concentrated on single well-defined behaviors. Behavior therapists have been able to increase exercise, participation in group discussions, attendance and participation in a variety of events, and walking behavior (Libbs and Clements, 1969; MacDonald and Butler, 1974; McClannahan and Risley, 1973; Mueller and Atlas, 1972). Behavior modification procedures have also been used to reduce or eliminate undesirable behaviors. Mishara, Robertson, and Kastenbaum (1973) have used operant procedures to eliminate self-injurious behaviors in older nursing home residents. Behaviors that were eliminated included refusal to wear clothing, scratching of one's body, and elimination of stressful activity for a heart attack patient. Such procedures could also be used to reduce other such behaviors e.g. refusing to eat, ingesting dangerous objects, and refusing to follow medical advice. Thus, behavior therapies have been shown to be useful in dealing with behavioral deficits associated with old age.

It seems that elderly people with behavioral deficits can be helped to overcome these deficits, at least in part. What must now be examined is how these elderly people are usually found to have deficits. This most often involves psychiatry and being diagnosed as having organic brain syndrome or more specifically senile dementia.
Analysis of the diagnostic criteria (American Psychiatric Association, 1968) will reveal the important role that verbal behavior plays in the diagnostic procedure. The first criterion for being diagnosed as having organic brain syndrome is "impairment of orientation". The person is asked to respond verbally to questions of time, place, and person. A person with faulty verbal behavior could easily score positive on this criterion. Second is "impairment of memory". This too is assessed by verbal responses from the person in question. A faulty or distorted verbal repertoire would again yield a positive score on this criterion. The third criterion is "impairment of intellectual function" and this again is assessed verbally. A person is asked to do calculations, give knowledge, and demonstrate learning. All these use verbal stimuli and require appropriate verbal responses. The fourth criterion is "impairment of judgement". This is assessed from the quality of the person's verbal responses. The psychiatrist must make a subjective judgement as to whether these statements

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1 This criterion is detailed in the Diagnostic and Statistical Manual of Mental Disorders II (American Psychiatric Association, 1968). The manual lists ten major categories of psychiatric disorders and their subdivisions. According to the manual, senile dementia or senile psychosis is a type of organic brain syndrome. The manual also lists the symptoms associated with each category and subcategory. There are certain symptoms that define a given category such as organic brain syndrome. There are additional symptoms that further define the subcategories such as senile dementia.
sound rational and logical. If they do not, the person will score positive on this criterion also. The fifth is "lability and shallowness of affect". This criterion often takes into account voice intonation, some verbal responses, and facial and body expressions. Furthermore, senile dementia criteria go on to include four additional criteria. One is "self-centeredness". It seems that this is scored positive when a person makes many verbal statements about himself and uses the pronouns I, my, or mine. Again assessed verbally. Another criterion is "difficulty assimilating new experiences". This too is often assessed via verbal stimuli and scored on the appropriateness of the verbal response. For example, a question might be, "Mr. Jones, how are you doing on the ward?" The patient may respond, "I miss having my own television set and why must the aides stand and watch when I use the toilet?" Such a response could easily be scored as difficulty assimilating new experiences. From a psychiatric point-of-view, the unit or ward routine is one of many new experiences for the person. Communal television and communal toilet facilities are part of this new experience. The closer supervision by staff is also such an experience. This supervision at times includes observing patients in bathroom areas. Prevention of injury and rapid response to injuries are only two of the reasons for observation in bathroom areas. This is simply part of the medically orient-
ed routine associated with nursing homes and mental hосpitals. Dissatisfaction with this routine can and often is viewed as a difficulty in adjusting to a new environment or experience. Another criterion is "childish emotionality". This is determined almost totally by the person's verbal responses. Such responses as giggling, laughing, euphoria, demanding behavior, or slight misnaming of objects or events could result in a psychiatrist labeling the person as having "childish emotionality". The final criterion is loss of recent memory, often with old or remote memory intact. This again is assessed by verbal stimuli and scored on the verbal response of the person in question. In this last criterion, one might expect a person to remember major events from the past rather than less positive mundane experiences that are relatively recent.

It must also be mentioned that if a person is about 65 years of age or older, the psychiatrist often already suspects organic brain damage or senile dementia. Thus, it could be stated that if a man had faulty verbal behavior and was over 60 years of age, he could readily receive the diagnosis discussed. This underscores the importance of verbal behavior in the diagnosis and placement of older people. Also, people with disrupted verbal behavior patterns are likely to receive less reinforcement and more punishment for that behavior. This could easily result in withdrawn or attention getting behaviors such as combative-
ness, not eating, loud noises, or other disturbances.

The importance of verbal behavior in the pattern of senility, senile dementia, or organic brain syndrome has led the author to wonder if it may be related to other verbal or language problems. In particular, could this pattern be related to aphasia? For the next several paragraphs, aphasia will be defined, the symptoms discussed, and their similarity to senile behavior pointed out.

**Aphasia**

Aphasia has been defined as a general language deficit that crosses all language modalities. It is characterized by impaired verbal retention span, the reduction of functional vocabulary, and impaired perception and production of messages (Schuell, Jenkins, and Jimenez-Pablon, 1964). It has further been defined as a language rather than a speech pathology and is to be clearly distinguished from disturbances whose onset manifestations may be similar, such as abnormal intellectual functioning or paralysis of the speech musculature. Aphasia, as considered here and as viewed by most contemporary researchers, involves language disturbances in decoding, manipulating, and/or encoding symbols whose etiology is to be found in brain damage (Devito, 1970). It should also be pointed out that aphasia may be complicated by other symptoms common to brain damage.

The aphasia syndrome consists of several distinct elements. First, an aphasic has sustained brain damage in one
or all of three speech areas of the brain. These areas are almost always found to be on the left hemisphere. The areas are the inferior parietal-posterior temporal area of the cortex (Broca's area), the posterior temporal lobes of the cortex (Wernicke's area), the superior speech cortex located in the superior parietal area of the cortex (Penfield and Robert, 1959). It has also been argued, however, that there are no specific speech centers and that damage to any portion of the cerebral cortex especially the left side would result in some speech defects and difficulty (Brain, 1965; Goldstein, 1948; Head, 1926; Jackson, 1958; and Luria, 1961). It is interesting to note that approximately one-third of those over 60 years of age develop abnormal electroencephalographic recordings over the anterior temporal lobe of the cerebral cortex, predominately on the left side (Busse and Obrist, 1965). This is the same general area that is believed to be responsible for aphasia.

A second symptom of the aphasia syndrome is that aphasics tend to confuse words that are closely associated in meaning or experience. The aphasic person may say man for boy or table for chair or June for July (Sies, 1974). From my own experience with institutionalized older people, the author has noted a similar trend. For example, a geriatric mental patient asked for "a long yellow" when he wanted a banana. Others have used similar closely associated words in place of the proper word.
Other symptoms of the aphasia syndrome include memory disruption, inability to name common objects, and inability to give simple biographical information. All three of these symptoms are very similar to those found in older persons who are said to be senile.

An example of a mild aphasic might help bring out the similarities between aphasia and what is often called senility. The person in this example is in his twenties, but imagine what might have happened if the person had been 65, 75, or 85 years old.

He said that he went back to his home town, saw people he had known all his life, and could not remember their names. He could not remember addresses or telephone numbers that he had known most of his life. One night, he played cards and found he could not keep score. He tried to balance his checkbook and found he was not able to do this. He read the paper and did not know what he had read. He listened to news on the radio and did not know what he had heard. He thought he was losing his mind and he lived in the terror that if someone discovered this he would most certainly be committed to an institution. He began to avoid people, he did not dare to try to get a job. He said that he had sat home and watched television for two years (Sies, 1974).

One final characteristic of aphasia is the recovery process. Aphasics are tested and found to be deficit in many words. They are trained on some of the words and retested. It is now found that they know not only those words that they were trained on, but many of the other words that they originally did not know. This process is often times termed a spontaneous recovery. It is this recovery process
that seems so exciting, not every word must be relearned. This means a great reduction in training time and a rapid recovery of language. If this same recovery process were found with older "senile" persons, greater recovery than usually anticipated should be possible. Furthermore, this recovery would take place much more quickly than many theorists have believed.

Fortunately, the treatment procedures for aphasia are relatively simple. The process starts with the most commonly used words. These are words that the aphasic would tend to use most frequently and these are also the words most rapidly recovered. These words are considered stimulation. Aphasia theorists like to look at the treatment not as teaching words or verbal responses, but rather as providing verbal stimulation which results in the aphasic recovering. This stimulation is a combination of visual and auditory stimulation. The words are presented slowly with many repetitions. The process starts with single common words and progresses to longer more complex phrases, sentences, and verbal material. The final stages of therapy are structured so that the person works with material directly associated with his work or home life. For example, if the person is a salesman, one would work with order forms, sales receipts, and product information.

It seems reasonable to believe that these aphasia treatment techniques would be helpful in the recovery of verbal
behavior deficits. It would seem that this treatment approach would be most effective if coupled with consistent reinforcement for appropriate verbal behavior or successive approximations of this behavior.

Thus, the purpose of this study was fourfold: First, to determine if the verbal behavior deficit of older persons, thought to be senile, could be reversed; second, to see if an aphasia treatment approach is effective in bringing about this change; third, to examine the recovery process to see if it resembles an aphasia recovery process; and fourth, to explore the possibility that the treatment increases the person's ability to learn.
Subjects And Settings

The research was conducted in a 120-bed, proprietary, skilled-care nursing home located in a suburban middle-income neighborhood. The building, constructed of brick, was a modern one-story structure and offered both private and semi-private rooms. At the time of this study, all beds were filled. The resident population ranged in age from 33 to 99 years with 75 to 80 the modal age group.

Three aged residents from Provincial House Inc., the previously described nursing home, served as subjects. The Nursing Home had an attending physician who made diagnosis and supervised treatment of the residents. The medical records were examined for diagnosis and other pertinent information. The records showed that Flora was a 79-year-old woman diagnosed as a paranoid schizophrenic with accompanying organic brain syndrome. Lester was a 72-year-old man diagnosed as organic brain syndrome with cerebral arteriosclerosis. Fay was a 82-year-old woman with organic brain syndrome.

Work experience on a mental hospital geriatric ward and the examination of the resident's records at Provincial House shows a new trend in psychiatric diagnosis. Psychiatrists have been criticized for classifying older adults with behavior deficits as manifesting senile dementia.
These critics feel this diagnosis is made on the basis of age alone not the accompanying symptoms. Thus, it has become increasingly popular to simply diagnose older persons with behavior deficits as manifesting organic brain syndrome.

**Procedure**

**Selection procedure.**

The three nursing home residents were chosen by two procedures. First, the nursing home administrator was consulted. She was asked to compile a list, with the help of her staff, of six to ten severely senile residents. To help with this, the psychiatric definition of senile dementia was reviewed. The residents were all to have been diagnosed to have organic brain syndrome, but no known specific brain damage such as a car accident, gunshot wound to the head, etc. It is not being suggested that behavior deficits associated with such brain injury is not reversible. Rather the author chose to deal only with those behavior deficits which had a gradual onset.

Second, the residents, whose names were on the list compiled by the administrator and staff, were presented with one-hundred picture-cards in random order from the Aphasia Rehabilitation Manual and Therapy Kit (Taylor and Marks, 1959). This kit was chosen because of the large picture size, about eight inches by eleven inches. The pictures in the kit were also free of excessive detail. That is, they were black and
white with only the object printed (no background figures). A subject was selected if he responded (vocally) appropriately to one, but not more than 25 cards. A subject was required to obtain at least one correct response to help insure that he did not suffer from a visual impairment. It was found by the author that eye examinations were not routinely done with older institutionalized persons. Those residents who wore glasses were also tested and trained with the aid of these devices. This still did not insure that the prescription was adequate or current thus, the need for some indication that the resident's eyesight was such that they could see the cards.

The cards were also large, approximately eight inches wide and twelve inches high. The figures were full-sized, black in color, on a white background. The subject's scores were as follows: Flora responded appropriately to 24 cards, Fay responded appropriately to 25 cards, Lester responded appropriately to 12 cards. There were seven names on the original list. None of these residents were really eliminated, rather the first three subjects on the list were used. Lack of time prevented working with more than three subjects.

After the subjects had been tentatively selected, the author met with each resident individually. Introductions were made by the activity therapist and a brief personal conversation followed. During this conversation, the
author explained who he was and that he was doing research with nursing home residents. The research included looking at a variety of picture-cards and naming the object on the card. Each person was then asked to participate in this research. All subjects indicated that they would take part. Whether each of these subjects fully understood what was discussed with them is not known. Each seemed to comprehend at least part of what was said. The activity therapist and the nursing home administrator took an active part in the research, often watching the testing and training sessions. No aversive techniques were used during the research. It was felt by all concerned that the residents’ rights were not being violated by the research.

During the second selection procedure, each subject was asked to name the object or part of the object on the picture-cards. If a subject responded to part of the picture when a response concerning the entire picture was appropriate, a prompt was given. The prompt was an agreement that what the subject named was in the picture. The experimenter then stated that what was wanted was to name the entire object, to respond to the whole picture. For example, a card was presented for which "man" was the appropriate response. The subject, however, responded suit and tie (the man was dressed in a suit and tie). The experimenter said, "You're right, there is a suit and tie, but who is wearing the suit and tie? What is this a picture of?" When the subject cor-
rectly named the object, the response was scored as correct. When the subject failed to appropriately name the object on ten separate occasions, it was scored as an error. The word was one the subject did not have in his repertoire.

At times a subject would be asked to name a portion of a picture, but instead he would name another portion or the entire object. Here again, a prompt was given. The experimenter would agree that what was named was in the picture, but what was wanted was to name a different portion. For instance, a picture of a man's face was presented. The experimenter pointed to the eye and asked, "What is this?" The subject responded "nose". The experimenter said, "Yes, there is a nose in this picture, but what is this right here?" The experimenter would then point to the eye with his finger. When the subject correctly named the object, the response was scored as correct. Again, when the subject failed ten separate times to name the object, it was scored as an error. Every chance was given for the subject to respond correctly to each card. If the subject responded correctly to a card, the card was placed aside and not seen again until the training phase of the experiment. If a response was incorrect ten separate times, the card was again set aside until the train-

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2 The use of ten failures was arbitrary, but gave the person ample opportunity to respond appropriately.
ing phase of the experiment. Any response which was close to the appropriate one was scored as correct. Also, during the entire experiment compatible responses were scored as correct. For example, sofa, davenport, settee, hide-a-bed, and even love-seat was scored as a correct response for the picture of a davenport. When a subject responded inappropriately, the experimenter merely said, "No, that's not right." He would then set it aside and later present it again, until each card was either correctly named or the subject had responded inappropriately ten times.

Silence was initially scored as neither a correct nor incorrect response. It was merely set aside and presented later. Originally a picture met each time by a silence of 60 seconds was to have been presented twenty times before being scored as an error. In the actual research, it was interesting to note that silence upon the presentation of a card occurred very seldom. All subjects in later presentations responded vocally in some manner to these cards. This could be taken as evidence that the social reinforcers used in the research appeared to be effective.

Treatment procedure.

The treatment procedure was arrived at by combining the aphasia treatment techniques and the author's own personal experience with older institutionalized patients in mental hospital geriatric wards. During the treatment phase of the experiment, each subject was trained on the picture-cards.
the Aphasia Rehabilitation Manual and Therapy Kit (Taylor and Marks, 1959). Treatment was given in half-hour sessions, five days a week for four weeks. The length of a session was determined by the author's past experience as optimum in relation to a subject's attention span. The 100 picture-cards were randomly divided into ten sets with ten cards in each set. Each subject was trained on a set of cards until criterion was reached or an impasse resulted. Criterion was defined as three consecutive correct responses to a card. An impasse was simply defined as not having reached this criterion after thirty trials on a card. When an impasse or criterion was reached, the card was placed away and the subject was neither trained nor tested on it again. Additionally, when an impasse was reached, the experimenter would make only the comment, "No, that is not right," and proceed with the next card or set of cards. All correct responses were met with enthusiastic praise and comments as to how well they were doing.

At the start of each training session, the experimenter would greet the subject by name. He then would briefly state, "We are going to go over some picture-cards like we did the last time that I was here. I will show you some cards and you tell me the name of the object on the card. O.K.?" The subject's cooperation and indication of understanding were obtained before the start of each train-
ing session.

Training of the picture-cards consisted of two parts. First, at the start of each new set, the subject was tested on the set of ten cards as was done with the 100 cards in the subject selection phase. The only difference was that during this testing phase, a subject was required to respond appropriately three times to a card. If a subject responded appropriately to a card three consecutive times, it was recorded as correct and set aside. The remaining cards were then taught to the subject. Specifically, ten cards were presented to a subject and responses recorded. The cards were presented a second time and responses recorded. The same cards were presented a third time and responses recorded. Now all cards which were responded to correctly on each presentation were set aside. The other cards were all presented in a similar fashion until three separate, consecutive, correct responses were obtained or an impasse resulted (see second part of training procedure).

During the second part of the training procedure, all cards which were not responded to correctly on the first three trials were presented one at a time. The subject was asked, "What is this?" When only a portion of a picture was being named, the experimenter pointed to that portion and asked, "What is this?"
was repeated twice, slowly and clearly. When a subject responded correctly, the experimenter responded, "That's right, very good. We'll try this one again later." The card was then placed aside and presented at a later time during the same session. If time was going over one-half hour, the card was presented in the next session. A card was removed when the subject responded correctly three consecutive times. When the subject responded incorrectly, the experimenter responded, "No, that is a ______." And would name the object. When a subject made a response similar to the one desired, the experimenter replied, That's close, try again. What is this?" In such a case, the original similar response was scored neither correct nor incorrect. For example, a picture of a cake was shown and a subject responded cobbler. Another time a picture of a bus was shown and the subject responded long. If the response was repeated or another incorrect response was made, it was scored as an error. When no response was made, the experimenter repeated the question, "What is this?" If no response followed, the experimenter said "This is a ______," and named the object. Subjects were asked to repeat the word and most often did. When no response was made for 60 seconds, the experimenter repeated the name of the object again and went to the next card. The silence was scored as an error. In every case in which the experimenter named the picture, extensive auditory stimulation was provided.
For example, a subject responded incorrectly to the picture of a dog. The experimenter said, "No, this is a dog--dog. Can you say dog for me? (pause) Have you ever had a dog as a pet? (pause) Do you like dogs? (pause) Nice dog, isn't it?" (pause).

The training process for a set continued until the subject responded correctly three consecutive times or failed to respond correctly thirty times. After a subject had either reached criterion or impasse on each card in a set, the next set of cards was presented.

**Reinforcement.**

During the entire treatment process, the experimenter provided ample social reinforcement for appropriate responses or successive approximations. The reinforcement included enthusiastic vocal praise, statement of how well they were doing, smiles, touching, and praise about the subject to others encountered after completion of a session. During sessions, the experimenter was supportive, encouraging, and patient. He remained calm, except for reinforcement, and allowed the subject to respond as much as possible.

**Data collection.**

Data was kept on the number of correct and incorrect responses to each card. Each subject's data was recorded on separate sheets. The data sheets were grouped by sets.
corresponding to the picture-card sets. All data were collected and recorded by the experimenter.
RESULTS

Rate Of Training

By the end of the four week period (four weeks was chosen because of other time commitments by the author), none of the subjects had completed the ten sets of picture-cards. Flora had completed eight; Fay and Lester had each completed four sets. It was noted, however, that as the sets were presented, all subjects became quicker in completing a set. Figure 1 shows each subject's rate of responding per set. Flora started by taking one hour and 45 minutes to complete the first set. By set seven, she had consistently reduced her time to 45 minutes to complete that set. In set eight, she slightly increased her time to one hour to complete the set. Fay started by taking two hours to complete the first set. She remained at this level until the last set in which she reduced her time to one for the set's completion. Lester required three hours and 15 minutes to complete the first set. His time dropped consistently until by set four he only required one hour and 45 minutes.

Average Number Of Trials Per Card

All subjects required fewer trials per card as the sets progressed. That is, fewer presentations of the cards were required to make the appropriate response. Figure 2 shows each subject's average number of trials per card. Flora averaged 15.6 presentations or trials per card on set 31.
Figure 1. Rate of Training Across Sets.

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Figure 2. Average Number of Presentations or Trials Per Card Across Sets.
one to reach criterion or impasse. This dropped slightly then rose to a high of 19.4 trials per card on set three. The average number of trials per card then dropped consistently to 6.6 by set eight. Fay averaged 23.9 trials per card on set one. This rose slightly to 24.6 trials per card on set two. Her average then dropped consistently to 5.7 trials per card for set four. Lester averaged 27.9 trials per card on set one to reach criterion or impasse. This average rose to 30 on set two, which means he reached criterion on none of the cards in this set. His average dropped consistently to 11.8 trials per card for set four.

Spontaneous Recovery

Spontaneous recovery here is used as it is in the aphasia literature. That is, a person is tested and found to be deficit in many words. He is trained on some of the words and retested. It is now found that he knows not only those words that he was trained on, but many of the other words that he originally did not know. In this research, spontaneous recovery was specifically defined as the percentage of words a subject could not respond appropriately to when originally tested, but used correctly at a later time and without any training.

Figure 3 shows each subject's rate of spontaneous recovery. Flora showed no such recovery in set one, but rose to a 22% rate in set two. In set three, she dropped again
Figure 3. Rate of Spontaneous Recovery Across Sets
to a zero level. Her spontaneous recovery rate then rose consistently to 67% on set six. The rate dropped to 57% in set seven and rose 80% in set eight. Fay showed an 11% rate in set one and dropped to a zero level in set two. Her rate then consistently rose to 67% in set four. Lester showed an 11% rate in set one and also dropped to a zero level in set two. His rate then rose consistently to 67% in set four.

Number Of Cards Mastered Across Sets

A grosser measure, but possibly easier to see the increase in correct responses, is the total number of words each subject mastered across sets. Figure 4 shows that Flora mastered seven cards in sets one and two. She dropped to five cards mastered in set three. She then rose to eight in set four, nine in sets five and six, and ten or 100% of the cards in sets seven and eight. Fay mastered four cards in sets one and two. She jumped to eight cards mastered in set three. Her rate increased to 10 or 100% of the cards in set four. Lester mastered one card in set one. He dropped to none in set two. He then jumped to six mastered in set three and seven in set four.
Figure 4. Number of Cards Mastered Across Sets

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DISCUSSION

All the information obtained from this study supports the belief that older people with behavioral deficits can learn. In this study, they were taught verbal behavior which they seemed to learn with increasing rapidity. Figures 1 and 2 show that time and number of presentations per card were both reduced as the treatment progressed. It is possible to read into these data the existence of some type of intellectual rehabilitation process. Another explanation, however, might be that these older people were learning to learn, thus reducing the time and the number of presentations of the cards.

Perhaps, the most interesting finding of this study, however, was the evidence of spontaneous recovery. That is, people are tested and found to be deficit in many words. They are trained on some of the words and retested. It is now found that they know not only those words that they were trained on, but many of the other words that they originally did not know. Coupled with the evidence that older people are capable of learning verbal stimuli with increasing rapidity, the retraining of verbal behavior for older people appears cost effective and feasible. This retraining seems cost effective in that not all of the person's past verbal repertoire needs to be retaught. Some of it can be retaught and the rest, often a large percentage,
returns without retraining. This saves a great deal of time and effort. It also seems that those words that must be retaught are learned with increasing rapidity. This contributes to the saving of time and effort.

Some anecdotal information seems important at this point. When the study began, Fay was wheelchair-bound and had been for some time. She even had to be held up in the chair by a Posey Chest Restraint. After about four weeks, it was noticed that Fay was now only propped up with a pillow. At the end of six weeks or about two weeks into the treatment phase, the nursing home activity therapist reported that the entire staff was pleased with what had been done for Fay. She stated that Fay was so much more alert and attentive now and even spoke back to the staff. By the end of the study, Fay was supporting herself in her wheelchair. A follow-up visit was made four months after the study had ended and Fay had continued to make good progress. Several staff members sought out the experimenter to comment on how much Fay had improved and credited it to the treatment she had received. At this time, Fay certainly was alert, attentive, and seemed to be very much aware of who the experimenter was. She even asked where he had been and if he would be returning.

Flora at the start of the study would wander the halls and often follow people around. She would make sounds and
speak words that she seemed to have coined herself. After about a week into the treatment phase of the study, a staff member reported that Flora was talking more "sense" now and using longer words than she had been. It was also reported that Flora was talking about the words that were gone over during the day's session. Thus, it seems that some generalization was taking place.

**Weakness Of Present Study**

A critical analysis of this study by the author yielded several areas of weakness which may have contaminated it. First, the possibility still remains that the results were nothing more than experimenter bias. That is, the experimenter was aware at all times of the hypothesis and how the data might turn out. This may have produced some inadvertent "cueing" of the subjects in such a way that it alone was responsible for the results. For an indepth view into this problem see Adair(1973). In the future, the actual role of the experimenter should be carried out by persons not aware of the hypothesis or desired outcome. These "blind" experimenters would be given a standardized set of instructions and training. This then should control for experimenter bias effects.

Second, the first selection procedure may have biased the study. The administrator may have picked residents who were most likely to benefit from such a program. The use of randomization of all residents should be used, with the
second selection procedure (testing on the picture-cards) eliminating those with mild or no verbal behavior deficits.

Third, the correctness of a response was judged by the experimenter alone. Interobserver reliability checks for appropriateness of responses would add credibility to the data.

Fourth, the setting may have interacted with the treatment or selection in such a way that it effected the results. The use of many subjects in several nursing homes would have controlled for much of the effects of the setting.

Fifth, some may claim that by merely talking with the residents for a half-hour daily would have attained similar results. This seems highly unlikely, but could be controlled for by adding a control group in which residents were only talked to for a half-hour daily.

Sixth, the study did not test for the maintenance of the treatment effect. In the future, follow-up studies of one, three, six, and twelve months might be a profitable addition. This would measure largely the reinforcers in the environment. If adequate reinforcers are present for normal verbal behavior, the treatment effects should be maintained. If the reinforcers are inadequate, one should expect a deterioration of the effect.

Seventh, the only reinforcer used in this study was social reinforcement (praise, smiles, etc.). Other studies
Burrill, McCourt, and Cutler, 1974; Geiger and Johnson, 1974; McClannahan and Risley, in press; Mishara, Robertson, and Kastenbaum, 1973) have shown that snacks, prizes, beer, money, coffee, cigarettes, access to shopping facilities, and entertainment to be effective reinforcers for the aged. It seems reasonable that a combination of reinforcers adjusted to each subject would produce larger gains in a shorter time.

Finally, a longer treatment period was needed. Four weeks was not adequate and perhaps eight or twelve weeks would have produced more valuable information. Four weeks was used in this study because of other time commitments of the author. It must be stated, however, that positive results were shown in only four weeks. This seems important since many professionals still feel behavior deficits associated with old age are not reversible.

Suggestions For Further Research

The present research has only been a starting point; correcting the verbal behavior deficits associated with older people must go much further. An approach similar to that used in aphasia might help. Here, aphasics are taught verbal material of progressive length and complexity. In the final stages of therapy, the aphasic works with those things he will use daily in his life. For example, a salesman would work with sales receipts, order forms, and product information. The older person might work with a checkbook,
income tax forms, property tax payments, and social security forms.

Still another form that future research might take is a more systematic teaching of language. One such approach is Distar (Direct Instructional System for Teaching Arithmetic and Reading). This approach was developed by Engelmann for teaching disadvantaged children in Project Follow Through. This approach has been expanded and now includes a Distar Language Program (Engelmann, 1969a; Engelmann, 1969b). The approach is designed to be used with small groups or individual instruction. The approach involves several factors. First, the program is designed to teach motivation and attention. The teacher is close to the pupils, ready to provide reinforcement for attending and working. Attention signals are explicitly used to get and hold attention to the teacher's presentation: "Everybody, listen." To make them even more effective, the signals are held for variable periods before the task is presented. This provides a kind of unpredictable reinforcement for attending and fosters persistent attending. If some do not attend, the teacher returns to the beginning of the task, gets attention, and re-presents the task. Second, the approach has specifically spelled out daily programmed lessons to be given by the teacher. Third, Distar is designed to get rapid, high-rate oral responses from everyone in the group. The teacher checks each person on each new skill through in-program
tests and individual responses during group instruction.

Fourth, the Distar programs contain teacher scripts with procedures for giving confirmation and social reinforcement at the right time. Correction procedures are built right into the program and specified for each possible kind of error that can occur. The teacher may lead the person through a hard-to-say sentence, or the teacher may just give the answer. It all depends on the type of the error. In any case, after a correction, the task is repeated to see if the person can do it before proceeding.

Fifth, continuous-progress tests, based on program content are given to the group each six weeks. The continuous tests provide the teacher with information about whether a person is performing at day-in-programs, ahead of day-in-programs, or behind. A diagnostic key gears the test results to program tasks so that remedial action can be taken, if needed, before it is too late (Becker, Engelmann, and Thomas, 1975; Engelmann and Bruner, 1971).

Still another possible avenue for future research would be using the programmed instruction material developed by Holland and Harris (1968). This material was developed and used for language retraining for adult aphasics. The authors concluded that the programmed instruction was a useful tool for recovery from aphasia. The program was set up on a behavioral model with use
of reinforcement for correct responses, immediate feedback, correction where needed, and a go-at-your-own-pace progression. This procedure could be adopted to older adults perhaps with great success.
SUMMARY

This study has examined the verbal behavior deficits of older persons thought to be senile. The data indicate that these verbal deficits can be corrected. The treatment approach was one used to treat aphasia, a language disorder. This approach seemed effective. The data revealed a recovery pattern similar to that of aphasia. Specifically, it demonstrated the spontaneous recovery phenomenon which is characteristic of aphasia treatment. Finally, the study indicates that the older person learns to respond appropriately to verbal stimuli with increasing rapidity.


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