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Improving the dressing skills of persons with Alzheimer's disease using picture cues

Talbert-Johnson, Carolyn, Ph.D.
The Ohio State University, 1991

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IMPROVING THE DRESSING SKILLS
OF PERSONS WITH ALZHEIMER'S DISEASE
USING PICTURE CUES

DISSERTATION

Presented in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy in the Graduate
School of The Ohio State University

By

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The Ohio State University
1991

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Approved by
John O. Cooper
Advisor
College of Education
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1991
"The Lord is my light and my salvation"

To my son, Todd Levelle Talbert and
my mother, Katherine Alice Gaiton
ACKNOWLEDGEMENT

I express sincere appreciation to the members of my committee: Dr. John O. Cooper, Dr. Ralph Gardner III, and Dr. Gregory Trzebiatowski for their encouragement and support throughout my doctoral program. A special thanks goes to my adviser for the energy, motivation, and scholarly leadership that he has given me. I would also like to thank Dr. Gwendolyn Cartledge for her words of wisdom.

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CHAPTER 1
INTRODUCTION

Behavioral gerontology is concerned with an applied behavior analysis of biological states and environmental conditions affecting behavior of elderly persons (Burgio & Burgio, 1986). It is a developing area of applied science. Wisocki and Mosher (1982) surveyed the existing literature and found that 107 articles were published between 1964 and 1980 describing behavior analysis with elderly persons. However, Burgio (1985) noted that although the number of behavioral articles on aging increased in the early 1970s, the increase quickly subsided, with an average of only 11 articles per year published between 1973 and 1980.

In the past 7 years there has been a re-emergence of behavioral study of aging (Carstensen, 1988). Special interest groups for behavioral gerontology were formed within the Association for Behavior Analysis and the Association for Advancement of Behavior Therapy. The first conference on Behavioral Gerontology was organized in 1986 by Pinkston at the University of Chicago. Also in 1986, Iwata organized and published a special issue of the Journal of Applied Behavior Analysis on behavioral gerontology. Blanchard (1988) and the associate editors of Behavior Therapy attempted to familiarize the readership with research on aging. There is an increasing number of experimental and theoretical articles addressing behavioral gerontology in the behavior analysis literature (e.g., Journal of Experimental Analysis of Behavior.,
Within the past 10 years, Hussian (1981) published Behavioral geriatrics: A behavioral perspective. Teri and Lewinson (1984) published Clinical geropsychology: New directions in assessment and treatment, and Pinkston and Linsk (1984) published Care of the elderly: A family approach. Carstensen and Edelstein's Handbook of clinical gerontology was published in 1987, and Wisocki's Clinical behavior therapy with the elderly client is in preparation. Further subjective evidence of this developing area is the perceived increased number of doctoral programs with emphasis in the area of behavioral gerontology, as well as an increase in the number of dissertations addressing behavioral gerontology.

The increasing interest in behavioral gerontology is also shown in the wide range of behaviors of elderly persons pinpointed for (a) treatment [e.g., incontinence (Burgio, Engel, McCormick, Hawkins, & Scheve, 1988, Grosicki, 1968; Mitteness, 1987), self-injury (Mishara, Robertson, & Kastenbaum, 1973), recreational skills (Pierce, 1975), self-management of behaviors including eating, dressing, elimination, and walking (Kanfer & Karoly, 1982; Burgio, Whitehead, & Engel, 1985), caregiver training (Linsk, Pinkston, & Green, 1982) communication skills (Bourgeois, 1990)] and (b) behavioral interventions [e.g., the design of living environments (Bayne, 1971; Hussian, 1981; Kastenbaum, 1968), foster grandparent programs (Fabry & Reid, 1978), home based behavioral family treatment (Pinkston, Linsk, & Young, 1988), and the application of operant procedures (Burgio, 1986)]. Most of the behavioral engineering for the elderly has occurred within psychiatric hospitals or
long-term nursing facilities. Application of these methods to community settings (private homes) is limited.

Discussions of behavioral deficits and excesses among the elderly are now common in the gerontology literature (Broady, Kleban, Lawton, & Silverman, 1971) although data on specific incidences of behavior problems (e.g., self-injury, mobility, incontinence, self-management) are sparse. Zimmer, Watson, and Treat (1984) surveyed 42 nursing homes and found significant behavior problems among 64% of the 3,456 residents. Ninety-five percent of persons 65 or older (14 % men, 38 % women) live in private housing, either alone or with relatives, with 10% to 20% having significant behavior problems such as memory deficit, disorientation, or decline in intellectual performance (Current Population Reports, 1984).

Ten percent of persons over 65 years of age and nearly 50% over 85 may have Alzheimer's disease. The National Institute on Aging (Newsweek, 1989), estimates 4 million elderly with Alzheimer's nationwide. With the steady increase in the number of persons over 65 years of age and the expected quadrupling of people over 85, the National Institute on Aging projects 14 million persons with Alzheimer's by the year 2050. Alzheimer's disease could be one of the biggest public-health dilemmas our society has encountered.

Alzheimer's disease is a progressive illness of gradual onset involving the deterioration of brain cells which may result in confusion and forgetfulness. The cause is unknown but ultimately the disease leads to severe intellectual and physical impairment and finally death. The symptoms and the rate at which the disease progresses vary from individual to individual. The average length of illness before death is 7 to 10 years but the illness may range from 6
to 20 years. Alzheimer's is a very idiosyncratic disease. Every patient's experience with the disease is unique.

Alzheimer's disease progresses in distinct stages: early, middle, and late. During the early stages the patient has trouble remembering, generally has good coordination and motor skills, and experiences mood swings. This stage is characterized by memory loss, confusion, and an inability to reason, to understand, and to conduct simple thought processes. In the middle stage the patient has difficulty making decisions and choices, needs assistance with activities of daily living, talks less, and may repeat words or phrases continuously. The patient is prone to wandering, anger, and violence. All the normal aspects of memory begin to fail progressively. Dysphasia (impairment of speech and failure to arrange words in a proper order) becomes more pronounced, and often, dyspraxia (loss of the ability to perform coordinated movements) and agnosia (loss of ability to perceive normal stimuli of the five senses) become very apparent to the family members (Winters-Miner, Blass, Richter, & Valentine, 1989). The last stage is the most critical. Most patients need constant supervision and attention. They become unable to carry on the simplest of conversations, and often, there is no recognition of relatives or there is misidentification of persons or objects. The patient is incapable of independent functions and requires total care (e.g., must be bathed, dressed, groomed). Eventually the person becomes incontinent. Death usually results from infections or pneumonia as a consequence of being in a bed for long periods of time.

Roughly 70% of persons with Alzheimer's live in private homes, either alone or with relatives. Families are the primary caregivers and eventually
provide round-the-clock attention. Family support is critical to the well-being of seriously impaired individuals. Caregiving can give satisfaction; yet, elderly spouses and family members experience considerable strain (Cantor, 1983; Zarit, Orr, & Zarit, 1985; Zarit, Todd, & Zarit, 1986; Pinkston & Linsk, 1984; Linsk, Pinkston, & Green, 1982). The impact of prolonged emotional and physical stress affects the immune system of family caregivers, making them more vulnerable to infectious disease (Linsk, Pinkston, & Young, 1988). In addition to the emotional and physical stress, caregivers are often of advanced age with chronic health problems that further increase the vulnerability to diseases.

The incidence of depression among family caregivers of Alzheimer's disease parents is dramatically higher than the incidence of depression in the general population (Coppell, Burton, Becker, & Fiore, 1985). The most troublesome component is the management of behavior problems.

Commonly held assumptions concerning the degenerative nature of Alzheimer's disease, the limited ability of patients to learn new information, and the gradual decrease in effective behavioral interaction with the environment have discouraged many in the helping professions from attempting therapeutic programs (Bourgeois, 1990). However, the use of behavior interventions with the elderly suggest that these strategies and tactics can be used effectively for persons with Alzheimer's disease. For example Burgio and Burgio (1986) and Carstensen found measurably effective positive environmental treatments for behavioral deficits and excesses during their reviews of applied research with elderly dementia patients.
Purpose of the Study

This study will examine the use of least-to-most response prompts with picture cues, with Alzheimer's participants in the middle stage of the disease, as a method for developing and maintaining dressing skills. By the middle stage of the disease, most Alzheimer's patients have trouble dressing themselves. They may dress inappropriately for the season, the time of day, or the occasion. They may also forget how to put their clothes on properly or have difficulty with buttons, snaps and zippers. They also put on "layers" (e.g., 6 pair of underpants) of clothing. Often they forget to change their clothes and frequently become distracted and confused by busy patterns in their clothes. Therefore, the use of picture cues with written instructions will be beneficial when the participant's memory regresses.

Research Questions

1. Will picture cues be functionally related to dressing skills of participants with Alzheimer's disease?
2. If picture cues improve dressing skills of the participants will that improvement be maintained?
3. If picture cues improve dressing skills during morning care, will that improvement transfer to evening care in the absence of additional training during the evening hours?
4. Will participants' self-help at meal times remain in steady state, improving, or worsening performance during a collateral untreated baseline condition?
Terminology

The terms and definitions used in this study are listed below.

**Alzheimer's disease:** A disease that is a form of dementia, a global neurological impairment characterized by slowly progressive and irreversible deterioration of the cognitive functions - speech, abstract thought, emotion, memory - and hence of the ability to take care of oneself, to identify time and place, to relate socially to others, to think and speak and act in a clear and reasonable way.

**Caregiver:** A person designated by the family to provide primary care for the person with Alzheimer's and that person may be the son, daughter-in-law, daughter, spouse. The ultimate goal of a caregiver is to help the care recipient maintain as much independence and control over his or her life as possible.

**Dementia:** An acquired persistent compromise in intellectual function with impairments in at least 3 of the following spheres of mental activity: language, memory, visuospatial skills, personality, and cognition (e.g., abstraction, mathematics). Dementia is a nonspecific clinical syndrome produced by a wide variety of disorders affecting brain function.

**Participant:** A person in the study who was identified as having Alzheimer's disease as diagnosed by a physician as exhibiting "probable Alzheimer's disease". The persons had a history of progressive intellectual decline and impaired mental status that could not be explained by other neurological or psychiatric illnesses.
**Picture Cues:** Pictures that serve as a prearranged visual cues that an individual uses to prompt the occurrence of a desired behavior. Picture cues can be drawings or photographs. This study used photographs of the participants.

**Least-to-most response prompts:** The system of least-to-most response prompts used the following prompts in this study: verbal prompts, gestural prompts, and then verbal and physical prompts.

**Dressing skills:** One of the skills persons with Alzheimer's disease may not be able to complete independently and with fluency. The participants were observered prior to baseline and differences were noted on: (a) the style of dressing (e.g., concerned about their appearance); (b) the rate of dressing (e.g., quick dresser); (c) physical impairment (e.g., vision problems); and (d) motor ability.

**Learning Opportunities:** The number of incorrect steps per minute as defined by the task in a learning trial.

**Performance Change:** The overall change (i.e., the multiplication or division) per minute.

**Aim:** Aim (A) indicates the frequencies we want the participants to achieve.

**Record Floor:** The record floor indicates the lowest possible non-zero frequency (1 divided by time in minutes).

**Standard celeration chart:** A standard instrument for the measurement of performance, performance change and learning. The chart provides a straight-line measurement of learning-CELERATION. The chart is set with: (a) frequencies up the left on 6 cycle x 10 scale; (b) calendar time on bottom synchronized on + scale; (c) 8 x 5.25 grid fits screens; and (e) 34 angle is doubling each Celeration Period.
**Accuracy of response:** For the performance of a response from the participant to be considered as accurate, the participant must have performed the task (step) with the use of the least-to-most response prompt, in a functional manner. The response did not have to be perfect, allowing for some flexibility in the topography of the response (e.g., A response was recorded as accurate when the participant put on a dress, even though the collar was not pulled out.)

**Maintenance:** The transfer of the response over time is demonstrated when the participant was able to transfer the improvement in dressing skills without experimenter's use of the least-to-most prompts and picture cues during morning or evening care.

**Collateral behavior:** Another self-help behavior in which component steps are needed to accurately complete the task. Eating was selected as the collateral behavior with dressing because it requires a combination of component steps to complete the process. When the targeted behavior digresses there is likely to be a regression in the collateral behavior as well.

**Day care:** A facility designed to meet the unique needs of persons with Alzheimer's disease. Options for Elders is a part of the Ohio Department of Aging a $9.2 million program designed to expand and coordinate in home care services for persons age 60 and over. Options for Elders main objective is to thoroughly involve clients and their caregivers in designing their own care plan. The program provides various services including: information and assistance, respite services, homemaker services, housing assistance, and day care in a nursing facility.
CHAPTER II
REVIEW OF THE LITERATURE

This chapter reviews the research and professional literature relevant to this study. The literature regarding response prompts is examined, specifically least-to-most response prompts, followed by an overview and summary of research in the skills areas identified as the most prevalent in the use of least-to-most prompts, community, daily living, social/leisure, motor, and self-care. Finally, because this study investigates the use of picture cues to increase the dressing skills of the elderly, this review briefly discusses the research in picture cues, self-recording, and precision teaching.

Response Prompts

Several response prompt techniques have been effective for teaching learners who exhibit moderate and severe handicaps (Wolery, Ault, Doyle, & Gast, 1986). These include time delay prompts, most-to-least prompts, system of least-to-most prompts, graduated guidance, and physical guidance (Wolery et al., 1986). These response prompts are often used to increase the likelihood that an individual will emit a correct response. Response prompts occur before or during the performance of a behavior. This review analyzes the least-to-most technique with a focus on the feasibility of using it to increase the independent dressing skills of persons with Alzheimer's.

Wolery et al. (1986) identified 275 applied research articles and found that the technique of least-to-most prompts was used more frequently with
individuals who have moderate and severe handicaps than any other prompting strategy. Least-to-most response prompting has been used frequently and successfully to teach a wide array of learners useful behaviors. Doyle and his colleagues (1988) identified 90 studies containing a total of 100 prompt sequences that used the technique of least-to-most response prompts. It has been used with preschool to adult learners, and with handicapping conditions ranging from boarderline to profound mental retardation. The majority of the studies have focused on individuals with moderate to severe handicaps.

The technique of least-to-most response prompts consists of a target stimulus, a hierarchy of at least two prompts, and the opportunity for the learner to respond independently (Doyle, Wolery, Ault, & Gast, 1988). If a correct response occurs following presentation of the target stimulus, reinforcement is provided; however if there is an error or no response occurs, the least intrusive prompt is delivered and the individual is given an additional opportunity to respond. This process is repeated until all of the prompts in the least-to-most hierarchy have been delivered or the individual responds correctly.

The technique of least-to-most response prompts is a strategy for transferring stimulus control from response prompts to the discriminative stimulus (Billingsley & Romer, 1983; Rosenbaum & Breiling, 1976), and as an error correction procedure (Cuvo & Davis, 1983). A variety of terms have been used to describe this strategy [e.g., augmented verbal instruction, (Rynders et al., 1979); prompt hierarchy, (Browder et al., 1984); sequential instructional program, (Kissel et al., 1980)]. They describe the same procedure of transfer of
stimulus control from least intrusive to most intrusive response prompts to the target stimulus.

Wolery and Gast (1984) give four procedural parameters for the technique of least-to-most response prompts. First, the instructor selects the modality and number of prompts and arranges them in a hierarchy from least to most assistance. Second, the target discriminative stimulus is presented at each prompt level. Third, a constant response interval is inserted between the levels of the hierarchy, allowing the individual an opportunity to emit a response (Lent & McLean, 1976). Fourth, all correct responses are positively reinforced regardless of the prompts. Least-to-most prompting allows the learner to respond in the presence of the natural SD on each trial and it permits the learner to determine the level of prompting needed for a correct response (Cooper, Heron, & Heward, 1987).

Cuvo and Davis (1983) classified and provided definitions for the verbal prompts, visual prompts, modeling, and physical prompts which are often found in the least-to-most response prompt hierarchies. These prompts are also referred to as the “tell, show, and touch or physical guidance” procedure (Sulzer-Azaroff & Mayer, 1977). Verbal prompts are presented as indirect verbal prompts (e.g., “What’s next?”) (Cuvo et al., 1981) or as direct verbal instructions (e.g., “Go make tea”) (Breen, Haring, Pitts-Conway, & Gaylord-Ross, 1985). Cuvo and Davis (1983) suggest that the frequent use of verbal prompts may be due to the assumed lack of intrusiveness, the relative ease with which they can be delivered and faded, and their frequent occurrence in the natural environment. Visual prompts (Cuvo & Davis, 1983) are completed or partial visual representations of the target response. Models as prompts are direct
demonstration of the correct response by the teacher. Physical prompts are generally assumed to be the most intrusive and to provide the greatest amount of assistance. With physical prompts an individual is bodily assisted through the completion of an action.

A review of this literature will focus on community and daily living, social/leisure, motor, and self-care. Traditionally these skills have been identified as the most prevalent in the use of least-to-most prompts. These four skill domains are important in the daily functioning of the disabled and the elderly and are critical for independent community living. Since most of the least-to-most response prompts research has focused mainly on the moderate and severely handicapped, and only a few studies have dealt with the elderly, both will be represented in this review.

Community and Daily Living. In the past years, procedures to teach a variety of community living skills to handicapped persons have been developed and evaluated. Due to the increased emphasis on community living for handicapped persons, a variety of studies have investigated procedures to teach community living skills such as monetary, transportation, shopping, pedestrian, cooking, and other community survival skills (Martin, Rusch, & Heal, 1982). The least-to-most prompt hierarchy is the most frequently advocated prompting strategy for use in community settings (Cuvo et al., 1978; Gaule, Nietupski & Certo, 1985; Schleien, Wehman, & Kieman, 1981).

Coon, Vogelsberg, and Williams (1981) found that individuals with severe disabilities can learn a wide variety of community activities. A number of response-prompting strategies have proven to be effective in establishing
reliable performance of community activities (Gaylord-Ross & Holvet, 1985; Sailor & Guess, 1983).

Several studies have looked at least-to-most response prompts as a method of increasing the independent daily skills of individuals with handicapping conditions. For instance Godby, Gast, and Wolery (1987) used two response prompting procedures, progressive time delay and least-to-most response prompts, to teach 3 trainable mentally handicapped students, to identify 8 functional objects. The procedures were compared in terms of effectiveness (establishing criterion level correct responding) and efficiency (sessions and trials to criterion). The authors found that both prompting procedures were effective in establishing correct responding at criterion levels. However, a study by Ault, Wolery, Gast, and Doyle (1988) compared the response prompting procedures (least-to-most and time delay) in teaching 2 students with autism to name numerals. Results showed that both procedures were effective in raising responding to criterion levels.

McDonnell (1987) examined the effects of time delay and increasing prompt hierarchy strategies on the acquisition of purchasing skills by 4 students with severe handicaps. The students were taught to purchase snack foods (a soft drink and a cookie) with values less than $1 from a convenience store and a fast food restaurant located near their school. Results showed that students mastered the purchasing skills with increasing prompt hierarchy training.

Ninety-five percent of persons 65 or older live in the community. Fourteen percent of men and 38% of women in the community live alone (Current Population Reports, 1984). It has been estimated that 10% to 20% of the elderly in the community have a significant memory deficit, disorientation, or
Physiological changes in the elderly, as well as a frequent decline in the health of these persons are important considerations for behavioral application.

Various behavioral procedures have improved participation of elderly persons in community programs. Response prompting may be useful for developing daily living skills for the elderly. Arrangement of the environment, reinforcement, and operant conditioning are also examples of behavioral techniques that may be useful. In a study by Hoyer, Kafter, Simpson, and Hoyer (1974), it was hypothesized that absence of verbal communication among elderly mental hospital residents represented operant behavior maintained by existing reinforcement contingencies (as opposed to being due to irreversible disease or aging phenomena). Lindsley (1964) was one of the first to recommend the development of prosthetic or supportive environments for the elderly based on operant principles.

The elderly often experience some degree of isolation from the community. They seldom venture out of the home to engage in activities such as socializing, shopping, sight-seeing, or conducting business, and visits from friends and family living in the community are usually infrequent.

The majority of elderly live in their own homes, confining their activities to their own communities. McEvoy and Patterson (1986) did an exploratory study with elderly dementia persons which combined a prompting and reinforcement system with specific training modules designed to teach the skills necessary for noninstitutional living, spatial orientation, and communicating with others. The dementia subjects showed improvements in several skill areas, while in other
areas no progress was made. The behavioral program used in the study was a short-term rehabilitative program designed to return institutionalized elderly to the community.

**Social/Leisure.** Social integration and social contacts are critical elements for the quality of life. Individuals with handicapping conditions often experience alienation from their nonhandicapped peers due to their lack of social skills. This lack of social skills may impact upon these persons being accepted by members of the community.

In a study by Kennedy, Homer, and Newton (1989), the social contacts of 23 adults with severe disabilities in a residential setting were monitored over a 30 month period. The authors reported that the adults made social contacts mainly with friends and acquaintances and averaged about 2 contacts daily. The authors provided a descriptive analysis for future research concerning the social contact patterns of disabled persons.

Schleien, Wehman and Kiernan (1981) studied the evaluation of instructional procedures for teaching a chronologically age-appropriate leisure skill for severely and profoundly handicapped adults. As severely multihandicapped individuals continue to be deinstitutionalized into group homes and other community living facilities, the ability to use leisure time independently and constructively will take on increased importance. An instructional cue hierarchy characterized by verbal cues, modeling and demonstration, and physical guidance was used.

As learners with severe handicaps approach and enter adolescence, the emphasis in instruction should change from a classroom based model to a community-oriented, service delivery model. A study by Breen, Haring,
Pitts-Conway, and Gaylord-Ross (1985) attempted to address this issue. Four high-school age students with autism and severe handicaps were trained to initiate and sustain social interactions with nonhandicapped peers in a commonly shared breakroom at 2 community job sites. A multiple baseline across subjects design was used to assess the effectiveness of a training package based on concurrent training of chains of responses using least-to-most response prompting and reinforcement of correct behavior. The learners were successfully taught to converse in a vocational break environment.

Isolation and withdrawal from community and family living are problems that are also associated with the elderly. Social isolation may occur because of too few opportunities for socialization. Low rates of social skills may be related to physical or social losses, too few sufficient reinforcers following social participation to maintain further socialization. The typical, isolated geriatric person frequently becomes nonverbal, poor in self-care skills, and eventually requires total nursing care. Maintenance of exercise, verbal skills, and social interaction is important regardless of one's age. There is little research in the area of response prompts with the socialization needs of the elderly.

Social inactivity has received a good deal of attention from behavioral gerontologists. Many programs aim to stimulate activities and social participation among the institutionalized elderly through positive reinforcement and prompting (McClannahan & Risley, 1974). A number of interventions - involving stimulus control, reinforcement of verbalizations, and social skills training - have successfully increased rates of interactions among nursing home residents (MacDonald, 1978). For instance, Hussian (1981) used stimulus
control and operant procedures to modify the wandering and self-stimulatory behaviors of the elderly. In fact a report by Hussian and Brown (1987) describes a stimulus control procedure that reduced exit-seeking behavior in demented patients to near-zero rates. Whereas the issue of reinforcement of verbalizations was addressed by Praderas and MacDonald (1986) in the employment of an intervention that was designed to improve qualitatively the interactions of subjects with significant others. In a multiple baseline design across behaviors, 4 subjects were trained on 4 components of conversational skills. Training consisted of instructions, modeling, behavior rehearsal, feedback, and reinforcement. The ultimate goal was to teach skills that would enable subjects to conduct satisfying telephone conversations. Some improvement was seen in all the subjects.

Kleitsch, Whitman, and Santos (1983) trained four elderly, socially isolated, moderately mentally retarded men using direct prompts and social reinforcement. This training procedure was highly effective for increasing the rate of the elderly residents' verbalizations both during training and under two generalization conditions. Follow-up data indicated that these results were maintained after 4 months.

Motor. Motoric skills are an important part of the lives of the severely handicapped population. These skills are needed to ensure that these individuals gain access to needed services and opportunities within the community.

Luyben, Funk, Morgan, and Clark (1986), conducted a program using a 9-step stimulus-response chain to teach 3 severely retarded adults to use a side-of-the-foot soccer response component. Intensive physical prompts were provided initially to teach each response component, then systematically faded.
The subjects achieved the no-prompt criterion after 29 sessions. The authors stated that the successive response components were learned after training was implemented. The follow-up data were obtained in the training room and in a gymnasium, and criterion was achieved with fewer than 3 reinstructions.

Using a reversal design, MacDonald and Butler (1974) demonstrated the effectiveness of a prompt plus contingent staff interaction and praise to increase distance walked by 2 elderly nursing home residents. In a similar study, Sperbeck and Whitbourne (1981) used verbal praise to increase mobility in 4 elderly nursing home residents. The investigators targeted both walking and self-wheeling and used nursing home staff as behavior change agents.

A major problem for the elderly is increasing the activity levels, especially with persons who refuse to walk or roll a wheelchair even though they have no medical problems or physical limitations that would prevent them from doing so. Inactivity over a period of time can have serious consequences for the person's general mental and physical health.

Various behavioral techniques have been designed to increase the motoric (e.g., ambulation) abilities in the elderly population. Medical care providers have recognized the potential benefits of exercise to elderly individuals and have called for increased prescription of exercise for this population.

Perkins, Rapp, Carlson, and Wallace (1996) reported a behavioral program to increase exercise among residents using contingent public notices of improvement and staff praise to reinforce exercise. At the close of the study, the writers were in the process of modifying their procedures so that subjects would provide social interaction and praise for each other; they found, however, that, even when prompted, nursing home subjects refused to interact with peers.
Many studies have focused on increasing ambulation in the elderly. One such study is MacDonald and Butler's (1974) which increased walking in two elderly residents of a nursing home who had been in wheelchairs for several months, although neither had any medical problem that prevented them from walking. The authors simply prompted the residents by asking them to walk to the dining room and by offering to help them get out of their wheelchairs. When the residents did so, they were praised and given social interaction. When they did not, the reinforcers were withheld.

A study by Burgio, Burgio, Engel, and Tice (1986) also focused on increasing the ambulation of elderly persons. The authors tested the effectiveness of a prompt-and-praise procedure for increasing walking distance and independence in eight nursing home residents. Walking distance and method of ambulation were observed just prior to mealtimes; in addition, mobility and social interaction were time-sampled in the living areas throughout the day. Treatment was lagged in a multiple baseline design across lunch and dinner meals within subjects, and across subjects within each of three units. In the mealtime setting, 2 subjects began walking the maximum scored distance during baseline; the other 6 subjects showed a marked increase in walking beginning with the first meal in which the intervention was applied. Six of the 8 subjects also progressed to more independent means of ambulation. Generalization of walking to the second meal was observed in all 4 of the subjects that were assessed. The intervention successfully increased the distance walked, but better ambulation had no effect on the rates of social interactions. The effects of the program were maintained at the 4-month follow-up.
Self-Care. Behavioral techniques are frequently used to teach self-help skills to persons with retardation but only a few studies in this area have taught elderly persons self-help skills. Self-care deficits among the elderly include losses in ability to dress, to eat independently, to maintain hygiene behaviors, and to use toilet facilities appropriately. Self-care deficits can be related to physical changes such as tremors, ambulation problems, or coordination difficulties. Often these self-care deficits arise when memory or cognitive organization declines.

Methods of teaching basic self-care skills to institutionalized retarded persons are well documented in the literature: dressing (Minge & Ball, 1967), toothbrushing (Horner & Keilitz, 1975), and toileting (Azrin & Foxx, 1971). Acquisition of laundry skills by young developmentally disabled adults was the focus of a study by Cuvo, Jacobi, and Sipko (1981). Five moderately and mildly retarded students in the public school system were taught to wash and dry their clothing independently. A series of subtasks were taught to the students utilizing 3 different prompt sequences during the training. Praise and response contingent feedback was used as a consequence for behavior. Results showed a rapid acquisition and maintenance of the laundry skills were obtained.

Horner and Keilitz (1975) used a system of least-to-most response prompts along with tokens and praise reinforcements to teach 4 adolescents with mental retardation to brush their teeth. Results indicated that all subjects improved their toothbrushing skills.

Three male mentally impaired persons were taught an instructional procedure composed of a graded sequence of prompts and token reinforcments were used to train a complex chain of behaviors which included sorting,
washing, and drying clothes. A multiple probe design with sequential instruction across 7 major components of the laundering routine was used. Students were taught to launder clothing using machines located in their school and generalization was assessed later on machines located in the public laundromat.

Diorio and Konarski (1984) evaluated a method for teaching dressing skills to profoundly mentally retarded persons. Three profoundly retarded adults were trained to dress and undress. The study was a systematic replication of Azrin, Schaeffer, and Wesolowski's (1976). A multiple baseline across subjects was used and a least-to-most prompting procedure. The rate and improvement of gains in this study were less than in Azrin's study, treatment gains did generalize across trainers and showed some degree of long-term maintenance.

There is a need to develop and validate programs to teach advanced independent living skills to persons with disabilities. A skill area that has received little attention and yet is critical to independence or semi independence in group homes, supervised apartments or real homes, is cooking and meal preparation. Schleien, Ash, Kiernan, and Wehman (1981) investigated the cooking skills of an adult at a community adult development center. The program incorporated a multiple baseline design across three different cooking skills. A system of least-to-most response prompting was used with social reinforcement. The participant learned to prepare all 3 meals and generalization probes suggested the participant was able to transfer the skills to other environments and across material and food items.

Self-care deficits among the elderly include losses in ability to dress, to eat independently, to maintain hygiene behaviors, and to use toilet facilities.
appropriately. Self-care deficits can be related to physical changes such as ambulation problems, tremors, and coordination difficulties. Often, however, self-care deficiencies arise when memory or cognitive organization declines. Then the cause is an inability to remember the time and procedural steps required to complete the task, rather than physical disability (Pinkston & Linsk, 1984).

Behavioral interventions targeting self-help skills can help the elderly to remain more self-sufficient and relieve staff and caregivers of many time-consuming tasks. In one report, Rinke, Williams, Lloyd, and Smith-Scott (1978) cited some success in increasing self-bathing in 6 nursing home residents. They examined the effectiveness of prompting and reinforcement for teaching independent bathing skills to the elderly. The intervention combined physical prompts (manual guidance) with verbal prompts (instructions) for several behavior categories involved in self-bathing (undressing, soaping, rinsing, drying, and dressing). The authors found that a combination of prompting and reinforcement (choice of food or grooming aids after each session) increased self-care in each behavior category.

Self-feeding behavior is one of the most often encountered problem areas in nursing home residents; often it is the first to go in a chain of self maintenance skills (e.g., nondressing, nontoileting). Self-feeding behavior is one of the highly desirable self-maintenance skills. A study by Baltes and Zerbe (1976) reported their attempts to help a 67 year old nursing home resident reacquire and maintain self-feeding skills. The authors used a treatment package which consisted of stimulus control, least-to-most prompting, immediate reinforcement procedures including a Premack procedure (drinking
The subject died before completion of the study, however the authors found that nursing home staff could facilitate healthy behavior through better use of behavioral management skills.

Urinary incontinence is a condition with numerous social, psychological, and medical implications for elderly persons, both in the community and in long-term care settings. Urinary incontinence is defined as the involuntary and inappropriate loss of urine due to failure to emit normal responses as the bladder fills, or the inability to reach the bathroom in sufficient time. The prevalence of urinary incontinence in community-residing elderly persons in the United States is estimated to range from 6% to 20% (Baigis-Smith, Smith, Roset, & Newman, 1989). Urinary incontinence may lead to premature institutionalization of an otherwise healthy person and to shame, fear, and even withdrawal from the community. Burgio, Engel, McCormick, Hawkins, and Scheve (1988) examined the efficacy of a behavioral intervention for treating geriatric incontinence in a long-term care setting. A primary goal of the project was to thin out the schedule of prompting/toileting as the subjects improved. After 2 weeks of baseline recording, subjects were prompted and toileted at regular time intervals throughout the day. The schedule of prompting/toileting was intensified if improvements in continence were not observed. For 3 of the 4 subjects, improvements maintained with less intensive schedules of toileting/prompting.

**Summary**

There is no consensus concerning the appropriate term for labeling the instructional strategy of least-to-most response prompts. The literature
reports at least 35 different names were provided including correction procedure, graduated increasing intervention hierarchy graduated prompting, and increasing assistance.

The technique of least-to-most response prompts is a widely reported instructional strategy which has been used effectively in teaching students and adults with a wide range of diagnostic categories. Some differences exist in the type of skills taught to subjects of different ages and diagnostic categories. It is an effective strategy that assists an individual in emitting a correct response. The number of levels in the least-to-most response prompts hierarchies range from 3 to 6 with 4 being most frequent. The number of different types of prompts in the hierarchies range from 1 to 4. Most often 3 types of prompts are included: (a) verbal prompt, (b) model or gestural prompt, and (c) physical guidance. In comparison to other instructional strategies the least-to-most response prompting technique is potentially more efficient than error correction alone.

Although the strategy has been used most frequently with adults who have severe to profound retardation, it has also been used with students of varying ages and with other handicaps. Research using the prompting technique with geriatrics with Alzheimer’s disease is limited. The fact that this strategy can be used across populations and across ages provides support that the strategy is flexible, versatile, and has generality. Four skill domains were discussed in this review. They were community and daily living, social/leisure, motor, and self-care.
**Picture Cues**

Picture cues are used to facilitate the acquisition of performance by first showing the client a picture of each step of the task to be performed and then training the client to use the pictures to guide his or her performance on the task. Martin, Rusch, James, Decker, and Trtoli (1982), suggest that picture cues promote self-control by establishing antecedent stimuli (pictures) which the learners can independently manipulate to guide their performance. The picture cues may establish a look-then-do sequence, which permits the learners to have greater control over their environments, and reduces the need for major changes of other environmental stimuli. The self-control established with picture cues should facilitate generalization and maintenance of performance because they provide stable discriminative stimuli which the learners can use to guide their performance across diverse settings, tasks, and time. Picture cues are easily transported to novel tasks and settings, are more easily modified than many other environmental stimuli, and they appear to reduce training time. The use of pictures as external cues can be controlled by the learner and can serve as unobtrusive and inexpensive permanent cues.

Picture cues help to establish independent behaviors by learners, and result in less reliance on supervisors or teachers. For example, Thinesen and Bryan (1981) used sequential pictorial cues and reinforcement (verbal praise and candy) to teach three mentally retarded adult males to self-initiate morning grooming behaviors. During the treatment condition, the participant was required to use the photo sequence as a guide to doing his grooming behaviors without the trainer present, thus requiring reduced staff supervision. All
participants demonstrated substantial increases in the number of grooming behaviors completed during treatment. Previously acquired behavior was maintained when picture cues were used as a reference source. Spellman, DeBriere, Jarboe, Campbell, and Harris (1978) believe that the major benefit of picture cues is the increase of generality and maintenance of behavior rather than the acquisition of performance.

The use of picture cues appears promising in the modification of performance of moderately and severely mentally retarded persons on complex daily living and vocational tasks (Johnson & Cuvo, 1981; Martin, Rusch, James, Decker, & Trtol, 1982; Sowers, Rusch, Connis, & Cummings, 1980).

Connis (1979) and Sowers et al. (1980) investigated the effects of a self-recording procedure using sequentially organized picture cues on independent task changes of four mentally retarded adults. The clients were first taught to use photographs to sequence the completion of various work tasks, and then to change tasks independently throughout the workday. During self-recording and picture-cue training, the subjects completed an increased proportion of independent task changes, and this behavior was maintained for more than 10 weeks following removal of the training procedures. Self-recording using picture cues was shown to be an effective procedure for teaching mentally retarded adults to function more independently in a job setting.

Johnson and Cuvo (1981) also used picture cues to train mildly and moderately mentally retarded clients to become more independent in daily living skills. Four mentally retarded adults were taught to cook various food items using pictorial recipes, sequence of prompts, and a package of positive
consequences. A multiple baseline across subjects demonstrated experimental control and a multiple baseline across responses was employed to examine generalization across cooking responses. The results showed relatively rapid acquisition of the three cooking skills, substantial maintenance of the newly learned responses, and idiosyncratic patterns of generalization within and between the cooking methods. There was also some evidence of generalization from the training setting to the participants' home.

It has become necessary to validate procedures for teaching specific job skills to individuals with severe handicaps in order to enhance their chances for employment in natural work settings. Employees are expected to work independently with little supervision. In a study by Wilson, Schepis, and Mason-Main this issue was addressed. The authors trained an adult with severe disabilities to perform a variety of food service tasks in a restaurant. A whole task, spaced trial training format was used. A booklet was constructed for each response, consisting of 2-in. × 4-in. photographs of the subject performing each step of the task analysis. A multielement feature was embedded within a multiple baseline design, which allowed experimenters to determine when fading of instructional stimuli should occur. The owners of the restaurant expressed satisfaction with the participant's work performance.

A promising approach to enhancing vocational independence is the use of self-control strategies, particularly self-monitoring and antecedent cue regulation in the form of picture cues. Four severely to moderately retarded high school students participating in a vocational training program were trained to use a picture-cue system in a study by Sowers, Verdi, Bourbeau, and Sheehan (1985). They investigated the use of picture cues and self-monitoring
to initiate a series of tasks of varying type and order. The system included photographs of vocational tasks that were inserted in the assigned order in a photobook sheet; self-management was accomplished by marking off each photo after its corresponding task was completed. Students were assigned seven tasks from a pool of 13 each day. The results showed that the students quickly learned to use the picture-cue system to change tasks throughout their workday without trainer prompts and that performance was maintained as trainer feedback and presence was decreased.

Wacker and Berg (1983) also examined the effects of using picture prompts on the acquisition, generalization, and maintenance of complex vocational tasks. The authors employed a multiple baseline design across subjects and tasks. Five moderately and severely mentally retarded adolescents were first trained to use picture prompts to guide their performance on one or more complex tasks. Following training, posttesting with and without the picture prompts was conducted to evaluate the effects of training and to determine maintenance effects over a 2- to 4-week interval. The results indicated that picture prompts can be successfully used to promote both acquisition and generalization of performance, and that subsequent training time on a novel task was reduced when the use of picture prompts had been previously trained.

In a study by Park, Smith, Morrell, Puglisi, and Dudley (1990) all of the stimuli presented, both cues and targets, were pictures. The subjects included 73 older adults (12 males and 61 females), who were community-dwelling individuals, aged 60 or older. All target stimuli used in the study were simple line drawings of concrete objects and all were presented in
the context of another picture. Thirty-two items were selected from the Snodgrass and Vanderwart (1980) picture norms as target items. Subjects were tested in groups of 2 to 5. The subjects studied 4 cue/target pairs, performed a brief distractor task, and then had a cued recall test of the 4 items. Results showed that the elderly can use specific contextual information effectively to support memory.

Butters, Albert, Sax, Miliotis, Nagode, and Sterste (1983) investigated 6 groups of subjects with alcoholic Korsakoff's syndrome, Huntington's disease, Alzheimer's disease or right-handed hemisphere damage, who were administered a picture recognition task in which they attempted to associate specific human and animal figures with particular scenic backgrounds. They examined the effect of verbal mediators on a picture recognition task. Under one condition (no story), no explicit verbal cues were provided to help the patients associate the figures with the scenes; in a second condition, stories linking the figures to the background scenes were read to the patients during the study period. The results showed that the groups differed in their tendency to make intrusion (i.e., perseverative) errors on the picture-context recognition task. Although they found verbal labels had no effect on the performance of Korsakoff subjects or those with senile dementia of the Alzheimer's type, it did improve Huntington's patients performance. The differences were attributed to the language, cognitive and motivational deficits associated with each disease.

The literature shows that picture cues can be effective with complex as well as simple tasks. Wacker, Berg, Berrie, and Swatta (1985) used a picture prompt package to train 3 severely handicapped adolescents to complete 3
complex vocational or daily living tasks. The tasks included a 21-step laundry folding task, a 12-step envelope stuffing task, and a 15-step task to dust tables. Results indicated that all students required many training sessions to learn the first training task.

Most of the literature with picture cues has emphasized the use of pictures in contextual detail at encoding and for retrieval of information. Park, Publisi, and Sovacool (1984) manipulated contextual detail in a stimulus set by reproducing cartoon pictures intact or with much of the background obliterated. Older adults were presented cartoon slides both with and without contextual detail for study. During recognition, presence or absence of background was crossed factorially with its presence or absence during encoding, and participants indicated whether they recognized the cartoon. The results showed that the older individuals did not profit from the additional elaboration or contextual detail at encoding. The findings generally suggest that contextual variables present in pictures are potentially important determinants of memory in elderly adults and worthy of future research.

Summary

Pictorial prompts have been used to teach vocational, food preparation, and daily living skills. Once individuals have been taught to use pictures as models to prompt their performance, teach-delivered prompts are gradually faded. The pictorial prompts need not be removed totally. They can become a natural, permanent prompt similar to the assembly instructions found in packaged kits. Picture cues have been effective in improving the functioning skills of persons with special needs. Picture cues
have been implemented with most areas in special education, from the severely disabled to the developmentally disabled individual. Various training settings have been used in the implementation of picture cues. The literature shows that picture cues have improved the quality of performance of persons with special needs in the work place as well as in the school setting. This technique has been used with many age groups as well. The literature shows that older adults can benefit from picture cues. A great deal of the literature involving the elderly has used pictures in conjunction with contextual integration for recall and retrieval of information. Picture cues have not been implemented as frequently with this population as it has with persons with disabilities. It is possible that the use of cues can be helpful in promoting retrieval of information from remote memory and that some cues are more effective than others. Behavioral strategies can be employed in the management of behavior of persons with Alzheimer's disease and could prove particularly helpful in maintaining a person's cognitive, functional and social abilities at the highest level possible. Bourgeois (1991) most recently illustrated this when she used a prosthetic memory aid (picture wallet) to enhance the conversational skills in patients with Alzheimer's disease.

**Precision Teaching**

Precision teaching is a method of measuring student performance regularly and frequently and using an analysis of the measurements to suggest instructional and motivational strategies capable of correcting failures to learn (West, Young, & Spooner. 1990). Ogden Lindsley, the originator of precision teaching states that "what was really new in [the]
procedure was precision, [so] we decided to use that as an adjective in front of whatever it was one was doing; hence in our case, 'precision teaching' (Lindsley, 1972). Lindsley was a student of B. F. Skinner and he built his precision teaching around a framework of operant conditioning and methods of experimental analysis of behavior developed by Skinner.

The framework included the 7 following basic elements:

1. The principle that the student knows best, or that the student's behavior can best tell us whether or not instruction has been effective.

2. An emphasis on the direct measurement of behavior and continuous monitoring (daily performance assessment).

3. The use of rate of response (e.g., number of correct answers per minute) as a universal measure of behavior.

4. A standard chart format or visual display that can be used to study performance patterns.

5. The use of descriptive and functional definitions of behavior and processes.

6. Ongoing analytical investigations of the impact of environmental influences (teaching tactics) on individual behavior (student learning).

7. An emphasis on building appropriate and useful behavior, rather than focusing exclusively on eliminating undesired or inappropriate behavior.

Precision teaching provides many response opportunities because it promotes fluency (increasing responses per unit of time). Greenwood, Delquadri, and Hall (1984) concluded that the number of opportunities to respond is consistently associated with gains in academic achievement.
Other researchers have found that fluency produces greater retention and generalization (Chomsky, 1978; Howell & Morehead, 1987). To date there is limited research that has used precision teaching with the elderly.

There are numerous advantages to using precision teaching including: (a) the counting period is always indicated on the chart; (b) you count up from the counting period floor, which always starts with "1"; this means that corrects and incorrects can always be charted on the same chart; and (c) the chart allows one to observe the changes in both the corrects and the incorrects and the pace of the correct movement will always be evident.

Precision teaching has been used mainly with academic areas. Students' progress can be easily timed before and after instruction at most areas of skill development. Precision teaching allows educators the opportunity to help their students build the tool skills needed to perform more complex tasks.

Precision teaching can also be used in settings in which academics is not the primary focus. Skill development in such areas as reading survival signs, sorting objects, following directions, naming (or signing names of) objects and making inappropriate noises are examples of nonacademic tasks. Behaviors can be counted to increase or decrease during other activities. Precision teaching is a valuable tool that assists the teacher in the organizational structure of the classroom.

In a study by McDade, Cunningham, Brown, Boyd, and Orlander (1991) 27 students in a study skills course at Jacksonville State University read novel passages for one minute daily, counted the number of words read
per minute, and plotted their results on the Standard Celeration Chart. The results showed that when compared with control students, the students using Precision teaching demonstrated greater gains in reading rate, vocabulary, and reading comprehension.

Carroll, McCormick, and Cooper (1991) evaluated repeated readings with word drill procedure as a method for increasing reading fluency of 4 elementary students having severe reading disabilities and severe behavior handicaps. The students read a passage repeatedly for 1 minute per session until they could read a minimum of 100 correct words per minute with no more than 3 incorrect words. If the students achieved fluent reading rates, a new passage was assigned. No conclusive results could be determined because there was no transfer of fluent reading to new passages.

Summary

Teachers are more effective if they clearly specify what they want to teach, provide opportunities for their students to learn, frequently measure the performance of critical skills, regularly analyze the performance data, and adjust instruction according to the analysis (West, Young, & Spooner, 1990). Precision Teaching is adjusting the curricula for each learner to maximize the learning shown on the learner's Standard Celeration Chart. Each learner daily charts their classroom accomplishment frequencies (Lindsley, 1991). In Precision Teaching, the instruction can be by any method or approach. Direct Instruction has been combined with Precision Teaching to form the most effective applications. Since it is useful
in many methods of instruction, Precision Teaching is growing in popularity and this is evident in the resurgence of the *Journal of Precision Teaching* and the celebration of the 25th anniversary of Precision Teaching.

**Self-Recording**

Educators are finding that self-control procedures can be used to improve the academic and interpersonal functioning of handicapped students (Lloyd, Hallahan, Kosiewicz, & Kneedler, 1982). Self-management of one's own behavior is an important strategy in the maintenance of behavior changes.

Self-management is a change program that results in the desired modification of one's own behavior. Self-management includes simple as well as more complex and long-running behavior change programs in which a person plans and implements one or several contingencies designed to change his behavior (Cooper, Heron, & Heward, 1988).

Self-monitoring is an important component of self-control techniques and has been defined as an individual's assessment of whether or not a target behavior has occurred and is usually followed by self-recording the event (Nelson & Hayes, 1981).

There are many advantages to using self-management strategies including: (a) it can be an effective method for extending the generality of behavior change; (b) certain kinds of behavior do not lend themselves to external-agent control; (c) persons with self-management skills can help operate a more efficient classroom; and (d) self-management
techniques can sometimes be used to control behaviors not affected by weak outcomes.

Self-management encompasses a variety of techniques including self-instruction, self-assessment (i.e., monitoring, recording, and evaluation) and self-determination and administration of reinforcers (Cooper, et al., 1988). Most of the research on the effect of self-management techniques in increasing attending behavior and academic performance has been done with children of at least average intelligence in laboratory and school settings (Nelson & Hayes, 1981). These techniques have also been used successfully with children in special education settings.

In a study by Lovitt (1984) he used event recording aided by a prompt to self-monitor the target behavior by using countoons to remind the children of not only what behavior to record, but also what consequences to provide for themselves.

Glynn, Thomas, and Shee (1973) found that second graders could use self-monitoring by placing a check mark in the next of a series of squares if they thought they were on-task at the moment they heard a tape recorded beep.

Harris (1986) used self-monitoring of attentional behavior and self-monitoring of productivity on on-task behavior and academic response rate. The subjects were four learning disabled students, ages 9 to 10 years, with significant attentional problems. During an initial interview with the teacher the students were told the importance and meaning of paying attention and the teacher explained that would
help the student to pay attention. The student was instructed to ask the question, "Was I paying attention?" each time he or she heard a randomly emitted tone on a tape recorder. Each student was given a piece of paper labeled "Was I paying attention?" which was placed on the student's desk. A check was placed in the "yes" or "no" column after each tone. Results indicated relatively equivalent increases on-task behavior over baseline during all treatment phases. Academic response rate also improved under both interventions, with self-monitoring of productivity showing a superior effect for one subject, an equivalent effect for one subject, and less clear results for two subjects.

Kapadia and Fantuzzo (1988) found that 3 children with developmental disabilities and severe behavior problems could be trained to use self-management procedures to sustain attention to preacademic/academic tasks. The study was conducted in a community-based residential facility. The prompting ribbon, a motorized red/green ribbon, was designed to help the children visually monitor time while increasing sustained attention to academic tasks. Throughout treatment and maintenance, the children self-monitored their performance using this "linear timer." At the same time, teacher-administered procedures were gradually replaced by self-management procedures. Results indicated that the children increased sustained attention to criterion levels, accurately utilized self-management procedures to sustain attention, and maintained these gains without instruction from staff persons.

Students and adults of all ages can be taught to self-monitor their behavior with various skills. It is a positive technique that can be implemented
with various populations.

**Summary**

Self-monitoring is an effective behavior change technique, however sometimes it may not be practical for all circumstances. An important variable attributed to the success of self-monitoring is the desire of the individual to change the behavior being self-recorded. When self-monitoring does produce a reactive effect, it is usually in the educationally or therapeutically desired direction. The effects of self-monitoring on the target behavior are sometimes temporary and may require the implementation of reinforcement contingencies to maintain the desired behavior changes.

The role of accuracy in self-monitoring is unclear; there is little correlation in the literature between accuracy and effectiveness.

Self-management can promote independent performance by allowing individuals to serve as their own change agents. The research shows that self-management procedures with learning or emotionally handicapped children of average intelligence can be as effective or more effective than traditional, externally mediated techniques, in maintaining and generalizing the desired behavior.

Self-management procedures have been used in vocational settings to increase and maintain work rates of developmentally disabled workers on tasks that have been learned, but are performed at a low rate. Self-management procedures can be used with prompting techniques in the acquisition and maintainance of tasks, in vocational as well as academic settings.
This study will be a systematic replication of a study conducted by Bourgeois (1990) in which she evaluated the effectiveness of teaching Alzheimer's disease subjects to use a prosthetic memory aid when conversing with familiar partners. The memory aid was a wallet which consisted of pictures or photographs mounted on white paper, laminated, and inserted into a plastic wallet. The 3 subjects learned to use the memory aid with the experimenter and a familiar partner which resulted in the improvement of the quality of their conversational content.
CHAPTER III
METHOD

This section describes the participants, setting, dependent variables, procedures, and experimental design of the study. A list and description of the materials used during the study are included.

Participants and Setting

Three women, between the ages of 66 and 88, with Alzheimer's disease served as participants. Each had a history of progressive intellectual decline and impaired mental status that could not be explained by neurologic or psychiatric illnesses. The participants resided in their homes, either alone with spouses, or with other family members. Participants were selected who: (a) had the motor and physical dexterity to dress; (b) self-dressed, but did it infrequently or inappropriately, or not at all; (c) read the written instructions on the picture cues (e.g., Please put on the underclothes. Please put on the shirt.); (d) described the physical movement indicated by a picture cue (e.g., photograph of the participant putting on a shirt); and (e) identified themselves in a photograph 3 times out of 3 counter balanced presentations. The study was conducted in the homes of the participants, specifically the participant's bedrooms. Radios, stereos, and televisions were turned off.

Mary B. was a 74 year old widowed mother of 5 children. She was diagnosed with Alzheimer's disease 2 years prior to the beginning of the study.
She resided in the home of her son and daughter-in-law and their two grown children. Mary B. could dress independently, however she changed clothing often during the course of a day. On other occasions she wore the same pieces of clothing for several days. Mary B. was frustrated because she had difficulty remembering events and was often disoriented. Mary B. did not like her daughter-in-law prior to the onset of the disease. This dislike continued throughout the disease. She attended a day care facility 3 times weekly.

Mary P. was a 66 year old who was the mother of 2 adult daughters. She was diagnosed with Alzheimer’s disease 2 years prior to the beginning of the study. Mary P. took medication for a thyroid condition and low sugar (tegretol). She had 3 major surgeries. Cognitively, she was disoriented and confused. Related symptoms of the Alzheimer’s disease produced vision difficulties. She had difficulty focusing on writing and other visual stimuli. Mary P. lived at home with her husband, the primary caregiver. When the experimenter began the study, Mary P. was totally dependent upon her husband to dress her. She attended a day care facility 5 times a week.

Florence was an 88 year old mother of 2 adult daughters. She was diagnosed with Alzheimer’s disease 4 years prior to the beginning of the study. Florence lived with one of her daughters. She awoke regularly during the night, 2 or 3 times, and washed or dressed, or simply wandered around the apartment hiding objects. Florence frequently changed clothing during the day also and she often put on 2 sweaters, 2 hats, and a coat, on top of her other clothing. Four different medications were prescribed for her which included vasatec, micro-K, chlorthalidone vitarine, and feldene. The medications were for high blood pressure, arthritis and to help her remain calm. She attended a day care facility 3 times a week. Table 1 provides the participant information.
### Participant Information

<table>
<thead>
<tr>
<th>Participant</th>
<th>Age</th>
<th>Stage</th>
<th>Medication</th>
<th>Caregiver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mary B.</td>
<td>74</td>
<td>Middle</td>
<td>No</td>
<td>Daughter</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>In Law/Son</td>
</tr>
<tr>
<td>Mary P.</td>
<td>66</td>
<td>Late -</td>
<td>Yes</td>
<td>Husband</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Middle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Florence J.</td>
<td>88</td>
<td>Late -</td>
<td>Yes</td>
<td>Daughter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Middle</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Mary B. and Florence could dress themselves independently but they needed assistance on selection of clothing items, appropriateness of items, and skills associated with proper grooming. Mary P. and Florence were rapidly entering the last stages of the disease. Both participants were becoming less coherent to the daily routines of life.
Experimenter

The experimenter was a third year doctoral candidate in Applied Behavior Analysis/Special Education at The Ohio State University. She taught middle and senior high students with developmental handicaps for 7 years, middle school students with learning disabilities/severe behavior handicaps for 1 year, and primary and intermediate students with developmental handicaps for 4 years. The experimenter received a B.A. and M.A. in special education with a concentration in developmentally handicapped. Her research interest is behavioral gerontology, specifically those having Alzheimer's disease. Her experience with the elderly includes a study conducted in a nursing home to increase the attendance of an exercise program through the use of a lottery system.

Definition and Measurement of the Dependent Variable

Task Analysis. A task analysis of dressing skills was identified and described. The task analysis provided the sequence for training and the operational definitions of the measurement of correct responses. Preliminary task analyses were written based on observing the normal dressing patterns of the elderly and conducting interviews with caregivers to determine if the expectations are realistic both physically and within reasonable time constraints. The experimenter also timed herself dressing to determine a time criteria. The task analysis was then tested with the participants during assessment (prebaseline). Five task analyses were identified with their specific response components. The 5 task analyses and their component parts were (a) underwear, 32 steps (e.g., brassiere, undershirt, slip) - 42 seconds; (b) top layer, 17 steps (e.g., shirt, blouse, sweater) - 19 seconds (pull over), 26 seconds
(button ups); (c) bottom layer, 16 steps (e.g., skirt, pants, slacks) - 28 seconds; (d) under layer (feet), 14 steps (e.g., socks, stockings, knee hi's) - 24 seconds; and (e) out layer (feet), 5 steps (e.g., slippers, shoes) - 12 seconds (slip-ons), 28 seconds (tie ups). Appendix C shows the complete task analysis for these steps. Each completed step in the task analysis was timed. These times were used to calculate a mean time that was used for each task analysis. Responses within a task analysis were trained sequentially, allowing for some flexibility in the participant's performance (e.g., the participant uses the left side instead of the right side). If the participant completed a task in a functional manner, however the results were less than perfect (e.g., has shirt on, but missed buttoning 2 buttons), the responses were recorded on the data response form (see Appendix L) by the experimenter as a correct response.

The task analysis began following the initial prompt by the experimenter (i.e., "(Name) it is time to get dressed."). A correct completion of the task analysis was defined as the independent performance of a step within the task analysis within 10 seconds of the previous response. All steps in the task analysis that were evoked by verbal or physical prompts was scored as correct also. During baseline and training, responses occurring out of sequence were recorded as incorrect. Dependent measures included the frequency of correct unprompted or prompted responses (a correct completion of the step within 10 seconds), within the task analysis, and incorrect responses. An incorrect response is defined as the inability to complete a response with the verbal and physical assists by the experimenter.
Interobserver Agreement: Dependent Variable

Three caregivers, ranging in age from 44 to 69 years, were trained as independent observers. The observers were family members who resided in the home with the participants and were retired or self-employed in the home. A written program describing the steps in dressing and the procedural instructions were presented to the trainers several days prior to the first baseline session. The independent observers were told to restrict talking to or physically interacting with the participants during the baseline and training sessions. During the initial observer training session, the experimenter explained the instructional procedures. The experimenter began training the caregivers on the treatment procedures after the second and fourth baseline session. The training package included a brief introduction to the purpose and procedures of the training, an explanation of a correct and incorrect response, illustration of modeling the treatment procedure and the attainment of reliability on the scoring and recording procedures. The interobserver agreement reports for the correct and the incorrect responses were evaluated with that of the experimenters, as well as the overall correct and incorrect responses.

The independent observer observed whether the participant completed the steps in the tasks analysis and scored all the responses using the same measurement procedure as the experimenter. Percentage of interobserver agreements was calculated for 1/3 of the sessions in each phase of the study for each participant. Percentage of agreement between the experimenter and the independent observer was determined by dividing the number of agreements, by the number of agreements plus disagreements and multiplying by 100.
Interobserver Agreement: Procedural Reliability

A procedural outline for each condition of the study was used to monitor the integrity of the independent variable. An independent observer observed and recorded the occurrence or nonoccurrence of each step in the task analysis, the number of prompts used, and the sequence of each step within the task analysis. The independent observer observed the application of procedures twice weekly during all phases of the study. During the observations, the procedures observed were recorded with a check mark on the procedural outline. The experimenter received the procedural checklist forms (see appendices K and L) as written feedback on procedural reliability. Reliability with the experimenter was estimated by comparing data sheets completed for each session. Reliability with the experimenter was estimated by comparing data sheets completed for each session by the experimenter and the caregiver.

Interobserver agreement scores were calculated for adherence to the procedural checklists for 10 baseline sessions and 12 intervention sessions. Interobserver agreement was calculated by dividing the number of agreements by the total number of agreements plus disagreements, multiplied by 100.

Materials

The following materials were used during this study:

Consent Form. A form signed by each participant and/or the caregiver to document informed consent. (Appendix A)

Guidelines for Clothing. All caregivers received a list of guidelines for the types and styles of suggested clothing for Alzheimer’s persons. (Appendix B)
Task Analysis. This task analysis describing the steps for dressing was used during baseline and the picture cues phase of the study. (Appendix C)

Reading Assessment Form. Twelve written sentences were read by the participants to assess their ability to read the sentences that accompanied the picture cues. (Appendix D)

Self-Check Card. A laminated self-check card containing all steps of each task analysis to be completed by the participant was used. (Appendix E)

Procedural Instruction Checklist. A procedural instruction form was used by the caregivers to monitor the consistency of which the procedures were followed. (Appendix F)

Recording Forms. A recording form was completed and used in conjunction with the procedural instruction checklist, the caregiver had to tally the number and type of prompts used per session and the amount of time given before use of the response prompt. (Appendix G)

Caregiver Assessment Form. A form was used by caregiver to rate the dressing skills of the participants prior to and following the study. This form served as a social validation of the study. (Appendix H)

Data Sheet - Celeration Chart. A data sheet was used to record correct and incorrect responses, number and type of prompts, and session duration. These data were displayed on the standard celeration chart (Pennypacker, Koenig, & Lindsley, 1972). (Appendix I)

Collateral Behavior Checklist. An assessment form was given to the caregivers daily to assess the stability of the eating ability of the participants. (Appendix J)
Celeration Chart. A chart will be used to record session duration and the number of prompts.

Pictures. Five 5 in x 7 in pictures of the participants were mounted on white construction paper and displayed as part of the intervention package. Pictures showed the participants in various stages of dressing. The pictures focused on the areas specified as the targeted task.

Camera. A Minolta 35 mm camera was used to capture pictures of the participants in various stages of dressing.

Film. Kodak 35 mm film was used in the Minolta camera to record pictures of the participants. The film had an automatic speed set with DX range from 50 to 1600.

Cassette Recorder and Blank Tapes. A Sony micro cassette recorder model M440V cassette recorder was used to record participant responses and experimental directions for the assessment of procedural reliability.

Water Soluable Marking Pen. Flair brand water soluble marking pens with either black or blue ink was used by the participant to mark the self-check card.

White Construction Paper. White 8 1/2 in X 11 in paper was used as a background for the sentences and pictures. The paper was folded in half. The top portion had a typed sentence. The bottom portion held the picture of the participant in various stages of dressing. Two holes were punched into the top of the paper.

Self-Adhesive Fasteners. A self-adhesive fastener with a 2 in capacity was used to mount the paper containing the sentences and pictures.
Stop Watch. A Casio standard stop watch was used to time the participants during the completion of steps within the dressing procedure.

Experimental Design

A multiple baseline design (Baer, Wolf, & Risley, 1968) across behaviors, was used to analyze the effects of treatment on dressing skills. Baselines were concurrent for all participants until stability of responding was evident or a counter therapeutic trend demonstrated. Picture cue training followed only those skills that needed remediation or did not meet criterion. The multiple baseline design across behaviors has one participant in a single setting who is treated for several functionally independent behaviors. In this study the multiple baseline design was by individual participants across the 5 task analyses. Following baseline assessment on all tasks, picture cue training was introduced on the first task (underclothes) or the task needing the most immediate remediation. When the participant met criterion for the first task (a decline in the frequency of errors), then training began on the second task. This procedure of baseline training across task analyses continued until all tasks needing remediation were trained. Criterion for training was that the participant met a fluency aim of 2 out of 3 consecutive sessions of completing the task analysis at or near the criterion aim as predetermined by the experimenter.

Procedures

Pre-baseline. The experimenter observed the independent dressing skills of the participants for two sessions prior to the beginning of baseline data collection. Pre-baseline was used to determine the current level of participants' self-dressing skills. Pre-baseline conditions were identical to baseline conditions except for the use of least-to-most response prompts and written
instructions. Caregivers assisted the participant during this condition. During this phase the experimenter also assessed if interruptions generally occurred in the homes during the morning hours.

**Baseline.** Baseline consisted of using least-to-most response prompts with written instructions and continued until steady state responding or a counter therapeutic trend was demonstrated. Baseline began as the participant awoke during weekday mornings, between the hours of 6 a.m. and 9 a.m. Each step of the task analysis was assisted with least-to-most response prompts and written instructions during baseline. The response prompts included a verbal instruction, a gestural prompt, and verbal with physical guidance. A verbal prompt told the participant what to do. The gestural prompt pointed to a piece of clothing. During the verbal and graduated physical guidance prompt, the experimenter told the participant what to do and gave physical assistance. If one prompt level failed to produce the correct response within 10 seconds, the next prompt level was given. The experimenter said "(Name), it is time to get dressed." After the initial statement, the experimenter waited 10 seconds. If the participant independently completed the first task analysis within 10 seconds, the experimenter waited 10 seconds for the participant to initiate the next step. The experimenter did not intervene as long as the participant responded independently to the steps in the task analyses within 10 seconds. If the participant failed to initiate a step independently within 10 seconds of the experimenter's initial statement or following a given step, then a verbal response prompt (e.g., "(Name) pick up the shirt") was given. If a second prompt was needed, the experimenter pointed to the specific piece of clothing (i.e., a gestural response prompt). If a third prompt was needed, the
experimenter said “Here (Name), let’s do it this way,” and physically helped the participant complete the task (i.e., verbal prompt and physical guidance).

When the participant completed all steps in task analysis 1, the assessment on task analysis 2 began without any statements by the experimenter. If the participant did not respond within 10 seconds, the experimenter said “(Name), please continue dressing.” This prompt procedure was repeated for each task analysis that follows.

Response consequences for correct responses included verbal praise (e.g., “Good job, (Name)! “You’re doing great!”) and verbal feedback (e.g., “(Name), you put your shoes on correctly today.”). Praise specific to each step will be provided on a continuous schedule for each correct and prompted response. Verbal feedback will be given on the steps within each task analysis. Corrective feedback was not used for incorrect responses. A self-check card with written instructions was placed on the door and will be. At the completion of the task, the participant, with verbal assistance from the experimenter (e.g., “(Name) check here if you have on your brassiere.”) self-checked the appropriate responses on the self-check card (see Appendix E). All baseline sessions were conducted once daily.

Picture Cue Training. This phase used the baseline procedures except for the addition of picture cues. Picture cues were a photograph of the participant to illustrate the completion of a specific dressing skill. For example, the task 1 showed the participant in her underclothes. There were 5 separate photographs to illustrate each of the 5 task analyses - from underwear (task analysis 1) to completely dressed (task analysis 5). Each task analysis will have a picture of the total task. The photographs were taped in a gradual
procesion as the participant mastered the steps. Only the first photograph was visible during picture cue training for task analysis 1, photographs 1 and 2 during picture cue training for task analysis 2, etc. The photographs were taped with self-adhesive fasteners on the participant's closet door. The pictures were laminated on white 8 1/2 in x 11 in construction paper on 8 1/2 in X 11 in individual white quick stick cards. The photograph size was 5 in x 7 in. The top part of the paper had the written instruction for self-dressing. The bottom half of the paper used the photograph to illustrate the written instruction (e.g., Put on the underwear). When a participant did not complete a step following the least-to-most response prompts and written instructions, then she was told to look at the photograph. The participant self recorded (marked a checklist) whether or not they (a) looked at the photographs, (b) looked at the appropriate photograph in sequence, and (c) started and completed dressing as shown in the photographs within the criterion time limit. A self-check card was placed after the last picture (task analysis 5).

Verbal instructional feedback (e.g., (Name), please look at the picture, you have your shoes on the wrong feet), were used with the viewing of the photographs. As the participant completed each step of the task analysis, verbal feedback was given specific to the response. If the participant failed to complete the appropriate step, response prompts were provided, as in baseline.

The following procedures were followed if the participant was noncooperative and refused to comply. The experimenter attempted to discuss the manner with the participant in a quiet and gentle voice. If that failed the caregivers were asked to intervene. Continual noncompliance resulted in the
experimenter leaving the home allowing the participant time to calm. This happened once with Mary B. She became resistant to my suggestions and refused to cooperate. The experimenter was able to talk her into completing the task.

**Maintenance Caregiver Training.** A maintenance probe was given 3 weeks after instruction by the experimenter ended. The caregivers were trained to administer the least-to-most response prompts and the picture cues as needed. The procedures used were identical to those employed by the experimenter. The maintenance probes were administered once weekly.

To enhance the possibility that persons with Alzheimer's disease will retain the use of the picture cues, an examination of the use of caregivers as trainers was warranted. In an attempt to elicit and maintain desirable behaviors and to provide the necessary contextual cues, it was speculated that the training should occur in a familiar setting with familiar persons. Researchers who trained family members (Green, Linsk & Pinkston, 1986; Pinkston & Linsk, 1984) reported success with the majority of skills taught and maintenance of treatment effects up to 6 months after treatment termination (Bourgeois, 1990).

**Assessment for Collateral Development.** Participants' self-help at meal times was assessed with a 10-item check list. This untreated baseline condition (see Appendix J) was used to evaluate the stability of the daily self-help at meal time. The caregivers provided a daily rating of the eating skills during breakfast. If the caregiver was unable to obtain a rating on the breakfast meal, assessments were obtained on the dinner meal.
Social Validity. Social validity (Wolf, 1978) was evaluated from caregivers' responses to the Caregiver Assessment Form (See Appendix H) following termination of the study. The same form was used as a pretest instrument. The Caregiver Assessment Form consisted of 26 questions pertaining to the physical appearance of the participant and the usefulness of the program. There were 4 response choices for each question (e.g., strongly agree, agree, disagree, strongly disagree).
CHAPTER IV
RESULTS

This chapter presents the results of the study. The chapter begins with a summary of procedural reliability. Individual participant data are presented for the dependent variables, steps in the task analysis completed, the rate at which the tasks were accomplished, the acquisition of the aim, the performance change for correct tasks completed, the number of learning opportunities per minute per task and the maintenance of steps learned. The participants opinions concerning the picture cue training are included at the end of the chapter.

Procedural Reliability

The experimenter completed a procedural reliability checklist for each of the study's 45 sessions. This procedural reliability form is in Appendix G. A procedural outline for each condition of the study was used daily by the experimenter to monitor the integrity of the independent variable. An independent observer observed the application of procedures twice weekly during all phases of the study. The independent observer used the same form and the response prompt form (see Appendix H). Data were collected on all 5 of the dressing tasks.

The experimenter implemented the least-to-most response prompts across all participants during baseline for 100% of the sessions. Picture
cue training was implemented on tasks in which the participant was not able to reach aim. These procedures were followed 100% of the time across all participants.

**Interobserver Agreement**

The results of interobserver agreement on the dependent variable are shown on Tables 4 and 5. The mean percentage of interobserver agreements are shown on Tables 2 and 3. After providing least-to-most response prompts for Mary P., the participant had a mean of 98% with a range of 96% to 100%. During the picture cue training the participants had a mean of 98% with a range of 95% to 100%. Interobserver agreement was assessed during a third of the observations, with the caregiver serving as the independent observer. Interobserver agreement on occurrence and nonoccurrence of the dependent variable was calculated separately by dividing the number of agreements by agreements plus disagreements and multiplying by 100. The mean level of interobserver agreement on occurrence of steps completed correctly across all participants was 99% (range, 98% to 100%). Mean interobserver agreement during baseline was 99% for Mary B. (range 98% to 100%), 98% for Mary P. (range 96% to 100%), and 99% for Florence J. (range 98% to 100%). Mean interobserver agreement during picture cue training was 99% for Mary B. (range 99% to 100%), 98% for Mary P. (range 97% to 100%), and 99% for Florence J. (range 99% to 100%).
Table 2

Mean Percentage Interobserver Agreement on Steps Completed Correctly Baseline

<table>
<thead>
<tr>
<th>Participant</th>
<th>Mean IOA</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mary B.</td>
<td>99</td>
<td>98-100</td>
</tr>
<tr>
<td>Mary P.</td>
<td>98</td>
<td>96-100</td>
</tr>
<tr>
<td>Florence J.</td>
<td>99</td>
<td>98-100</td>
</tr>
</tbody>
</table>

Note: Interobserver agreement measures were taken on at least 14 of 30 for each participant representing 46% of the sessions.
Table 3

**Mean Percentage Interobserver Agreement on Steps Completed Correctly**

**Picture Cue Training**

<table>
<thead>
<tr>
<th>Participant</th>
<th>Mean IOA</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mary B.</td>
<td>99</td>
<td>99-100</td>
</tr>
<tr>
<td>Mary P.</td>
<td>98</td>
<td>97-100</td>
</tr>
<tr>
<td>Florence J.</td>
<td>99</td>
<td>99-100</td>
</tr>
</tbody>
</table>

**Note:** Interobserver agreement measures were taken on at least 7 of 12 for each participant representing 58% of the sessions.
### Table 4

**Percentage of Interobserver Agreement on Completion of Steps by Experimental Phase - Baseline**

<table>
<thead>
<tr>
<th>Participant</th>
<th>Task</th>
<th>Sessions</th>
<th>IOA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mary B.</td>
<td>Pull-over</td>
<td>13(6)</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Button-up</td>
<td>7(1)</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Slacks</td>
<td>41(19)</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>Knee-hi's</td>
<td>15(7)</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>Shoes</td>
<td>42(19)</td>
<td>100</td>
</tr>
<tr>
<td>Mary P.</td>
<td>Underclothes</td>
<td>25(10)</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>Pull-over</td>
<td>32(14)</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Slacks</td>
<td>48(21)</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>Socks</td>
<td>42(18)</td>
<td>96</td>
</tr>
<tr>
<td></td>
<td>Shoes</td>
<td>48(21)</td>
<td>100</td>
</tr>
<tr>
<td>Florence J.</td>
<td>Underclothes</td>
<td>17(6)</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Dress</td>
<td>15(7)</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>Stockings</td>
<td>16(6)</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Shoes</td>
<td>30(14)</td>
<td>98</td>
</tr>
</tbody>
</table>

**Notes:** Numbers in parentheses indicate the number of sessions independently scored by second observer during the baseline condition.
Table 5

### Percentage of Interobserver Agreement on Completion of Steps by Experimental Phase - Picture Cue Training

<table>
<thead>
<tr>
<th>Participant</th>
<th>Task</th>
<th>Sessions</th>
<th>IOA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mary B.</td>
<td>Pull-over</td>
<td>13(7)</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Button-up</td>
<td>9(4)</td>
<td>99</td>
</tr>
<tr>
<td></td>
<td>Knee-hi's</td>
<td>25(12)</td>
<td>100</td>
</tr>
<tr>
<td>Mary P.</td>
<td>Underclothes</td>
<td>23(11)</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Pull-over</td>
<td>14(7)</td>
<td>97</td>
</tr>
<tr>
<td>Florence J.</td>
<td>Underclothes</td>
<td>6(2)</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Dress</td>
<td>12(7)</td>
<td>99</td>
</tr>
<tr>
<td></td>
<td>Stockings</td>
<td>12(5)</td>
<td>100</td>
</tr>
</tbody>
</table>

**Notes:** Numbers in parentheses indicate the number of sessions independently scored by second observer during the picture cue training condition. There was no picture cue training for Mary B. on the slacks and shoes tasks; Mary P. on the slacks, socks, and shoes tasks; and Florence J. on the shoes task.
Mary B.

Figures 1.0 - 1.4 shows Mary B’s performance for the 5 dressing tasks which includes, pull-over blouse, button-up blouse, slacks, knee-hi’s, and shoes. Mary B. was not assessed on her underclothes because she generally slept in her underclothing or she had them on when the experimenter arrived at the home.

Baseline (Least-to-most response prompts) Pull-over blouse. Mary B. had a total of 13 baseline sessions. The median number of learning opportunities (i.e., incorrect steps) per minute was 0. She completed the task without prompts. The weekly celeration for corrects multiplied by 1.6. Her baseline performance change (i.e., the distance between the low and high frequency) multiplied by 1.5. The record floor was stable the first 3 weeks with a gradual decrease from 24 seconds to 14 seconds. The record floor aim of 19 seconds was met on the last session in baseline with a time of 14 seconds. The aim for correct frequencies was 23 steps.

Picture Cues. Mary B. had a total of 13 picture cue sessions, Mary’s weekly learning celeration for correct steps per minute divided by 1.6 during the first 3 weeks of picture cues. During the final four weeks of this condition her frequencies of correct steps multiplied by 1.5. Her picture cue performance change multiplied by 1.5. Nine of the 13 picture cue training sessions met aim. The aim was set at 26 seconds. Record floors were increasing as the time for the record floor decreased with a record floor range from 21 seconds to 11 seconds. Nine of the 12 sessions in the picture cue sessions met aim. The aim was set at 26 seconds. Once the floor aim was met the record it remained stable at a median of 14 seconds. Prior to aim the record floor was increasing gradually.
**Maintenance Caregiver Training.** A maintenance phase began for the next 3 weeks after the picture cue training. During maintenance the caregivers were taught the techniques used by the experimenter during the study. There were 3 sessions, once a week, of maintenance data. This phase showed corrects multiplying by 1.0 and remaining at aim. The median number of learning opportunities per minute remained 0 and record floors remained stable at 12 seconds. Mary continued to perform at aim.

**Baseline Least-to-most response prompts Button-up blouse.**

There were a total of 7 baseline sessions. The median number of learning opportunities (i.e., incorrect steps) per minute was 0. Mary completed the task without prompts. The weekly celeration for corrects multiplied by 1.3. Her baseline performance change (i.e., the distance between the low and high frequency) multiplied by 1.0. The first 3 weeks of baseline the record floor was stable with a decrease from 43 seconds to 33 seconds. A record floor aim of 26 seconds was met on the last 3 baseline sessions. The aim for correct frequencies was 11 steps.

**Picture Cues.** There was a total of 9 picture cue sessions. Her weekly learning celeration for correct steps per minute multiplied by 1.0. Her picture cue performance change multiplied by 1.3. Stable record floors were seen with a range of 11 seconds to 21 seconds. All of the picture cue sessions met aim.

**Maintenance Caregiver Training.** There were no button-up blouse tasks during the 3 weeks following picture cue training. Mary B. wore only pull-over blouses.

**Baseline Least-to-most Response Prompts Slacks.** Mary B. had a total of 41 baseline sessions. The median number of learning opportunities
(i.e., incorrect steps) per minute was 0. She completed the task without prompts. The weekly celeration for corrects multiplied by 1.0. Her baseline performance change (i.e., the distance between the low and high frequency) multiplied by 1.0. The first 3 weeks Mary had stable performance but it was below aim. The third week a jump up was seen in the frequencies with the change multiplying by 1.0. The record floor followed the same pattern with a range of 29 seconds to 45 seconds in the first 2 weeks to a range of 11 seconds to 38 seconds in the remaining baseline period. A record floor aim of 28 seconds was met on the 11th session in baseline with a time of 28 seconds. The aim for correct frequencies was 10 steps.

Maintenance Caregiver Training. Three weeks after the picture cue training a maintenance phase began. During maintenance the caregivers were taught the techniques used by the experimenter during the study. Three sessions, once a week, of maintenance data was collected. This phase showed corrects multiplying by 1.0 and remaining at aim. The median number of learning opportunities per minute remained 0 and record floors remained stable at 16 seconds. Mary continued to perform at aim.

Baseline Least-to-most Response Prompts Knee-Hi's. Mary B. had a total of 15 baseline sessions. The median number of learning opportunities (i.e., incorrect steps) per minute was 0. She completed the task without prompts. The weekly celeration for corrects multiplied by 1.0. Her baseline performance change (i.e., the distance between the low and high frequency) multiplied by 1.0. The record floor was variable with a decline in the rate from 58 seconds to 41 seconds. The record floor aim of 24 seconds was not met during the baseline condition.
**Picture Cues.** Mary B. had a total of 25 picture cue training sessions. Mary's weekly learning celeration for correct steps per minute multiplied by 1.0. Her picture cue performance change multiplied by 1.0. Record floors were increasing as the time for the record floor decreased with a record floor range from 17 seconds to 15 seconds. A record floor aim of 24 seconds was met on 23 of the picture cue training sessions. Stability was seen in Mary's performance.

**Maintenance Caregiver Training.** A maintenance phase began for the next 3 weeks after the picture cue training. During the maintenance phase, the caregivers were taught the techniques used by the experimenter during the study. There were 3 sessions, once a week, of maintenance data. This phase showed corrects multiplying by 1.0 and remaining at aim. The median number of learning opportunities per minute remained at 0 and the record floors remained stable at 15 seconds.

**Baseline Least-to-most Response Prompts Shoes.** Mary B. had a total of 42 sessions. Aim was met immediately at the start of the condition. The median number of learning opportunities (i.e., incorrect steps) per minute was 0. She completed the task without prompts. The weekly celeration for corrects multiplied by 1.0. Her baseline performance change (i.e., the distance between the low and high frequency) multiplied by 1.0. The record floor was stable with a range of 10 seconds to 27 seconds. The record floor aim was set at 12 seconds with a frequency aim of 6 steps. Aim was met on 31 of the 42 sessions.
**Maintenance Caregiver Training.** Three weeks following the picture cue training a maintenance phase began. During the maintenance condition the caregivers were taught the techniques used by the experimenter during the study. There were 3 sessions, once a week, of maintenance data. This phase showed corrects multiplying by 1.0 and remaining at aim. The median number of learning opportunities per minute remained 0 and record floors remained stable at 14 seconds.
Figure 1.0
Figure 1.0

Mary B. Pull-over

Maintenance Caregiver Training

x 1.6  x 1.5  x 1.0

SUCCESSIVE CALENDAR DAYS  Mary B.  74 Alzheimer's Pull-over
Behavior  Age  Label  Counted

University  Carolyn T-Johnson  Carolyn T-Johnson  Carolyn T-Johnson
Timer  Counter  Charter

Figure 1.0
Figure 1.1
Figure 1.1

Mary B.
Button-up

SUCCESSIVE CALENDAR DAYS
Mary B. 74 Alzheimer's Button-up
Behavior Age Label Counted

Carolyn T-Johnson Carolyn T-Johnson Carolyn T-Johnson
Timer Counter Charter

Figure 1.1
Figure 1.2
Figure 1.2

Mary B. Stacks

Maintenance Caregiver Training

x 1.0

x 1.0

SUCCESSIVE CALENDAR DAYS: Mary B. Alzheimer's Stacks

Imager Behavior Age Label Counted

Carolyn T. Johnson Carolyn T. Johnson Carolyn T. Johnson Carolyn T. Johnson

Agency Timer Counter Charter

Figure 1.2
Figure 1.4

John O. Cooper  Carolyn T. Johnson  SUCCESSIVE CALENDAR DAYS  Mary B. Behavior  74 Alzheimer's Age Label
Supervisor  Manager  Deposition  Agency  Counter  Charter
Ohio State University  Carolyn T. Johnson  Carolyn T. Johnson  Carolyn T. Johnson
Agency  Timer  Counter  Charter
Figure 1.4

Mary B.
Shoes

Maintenance Caregiver Training

x 1.0

SUCCESSIVE CALENDAR DAYS
Mary B. 74 Alzheimer
Shoes

State University
Caroline T-Johnson
Timer

Carolyn T-Johnson
Counter

Carolyn T-Johnson
Charter

Figure 1.4
Mary P.

Figures 2.0 to 2.4 shows Mary P's performance for the 5 dressings tasks which includes, underclothes, pull-over blouse, slacks, socks, and shoes.

**Baseline Least-to-most Response Prompts Underclothes.** Mary P. had a total of 22 baseline sessions. The median number of learning opportunities (i.e., incorrect steps) per minute was 7. The weekly celeration for corrects multiplied by 1.0. Her baseline performance change (i.e., the distance between the low and high frequency) multiplied by 1.0. The record floor was stable the first 3 weeks with a gradual decrease from 2 minutes to 40 seconds. The record floor aim was set at 42 seconds with a frequency aim of 23 steps. Aim was not met during the baseline phase.

**Picture Cues.** Mary P. had a total of 23 picture cue sessions. Mary's weekly learning celeration for correct steps per minute multiplied by 1.0 during the 6 weeks of picture cue training. The median number of learning opportunities per minute was 6. During the final 4 weeks the frequencies of correct steps multiplied by 1.0 with an increase in the frequencies. Her picture cue performance change multiplied by 1.0. Record floors were decreasing as the times remained stable. A record floor aim of 42 seconds was met on 4 of the 23 sessions in the picture cue training with a frequency aim of 23 steps.

**Maintenance Caregiver Training.** Three weeks following the picture cue training a maintenance phase began. The caregivers were taught the techniques used by the experimenter during the maintenance condition. There were 3 sessions, once a week, of maintenance data. This phase showed corrects multiplying by 1.0 and remaining at aim. The median
number of learning opportunities per minute remained at 7 and record floors remained stable at 33 seconds. Mary’s performance was adequate.

**Baseline Least-to-most Response Prompts: Pull-over Blouse.**

Mary P. had a total of 32 baseline sessions. The median number of learning opportunities (i.e., incorrect steps) per minute was 2. The weekly celeration for corrects multiplied by 1.3. Her baseline performance change (i.e., the distance between the low and high frequency) multiplied by 1.3. The record floor was variable with a gradual decrease from 30 seconds to 12 seconds. The record floor aim was set at 19 seconds which was met on the 26th session of baseline. The frequency aim was set at 7 steps.

**Picture Cues.** Mary P. had a total of 14 picture cue sessions. Mary’s weekly learning celeration for correct steps per minute increased by 1.3 during the 4 weeks of picture cue training. The median number of learning opportunities was 0. Her picture cue performance change multiplied by 1.3. Record floors were increasing as the time for the record floor decreased with a record floor range of 24 seconds to 12 seconds. The record floor aim was set at 19 seconds and was not met on 9 of the 14 sessions in the picture cue training. Once the floor aim was met it remained stable at a median of 24 seconds.

**Maintenance Caregiver Training.** Maintenance began for the next 3 weeks following the picture cue training. The caregivers were taught the techniques used by the experimenter during the study in the maintenance condition. Three sessions, once a week, of maintenance data was collected. This phase showed corrects multiplying by 1.0 and remaining at aim.
median number of learning opportunities per minute remained 0 and record floors remained stable at 16 seconds. Aim continued to be met.

**Baseline Least-to-most Response Prompts Slacks.** Mary P. had a total of 47 baseline sessions. The median number of learning opportunities (i.e., incorrect steps) per minute was 3. The weekly celeration for corrects multiplied by 1.0. Her baseline performance change (i.e., the distance between the low and high frequency) multiplied by 1.0. The record floor was stable the first 4 weeks with a jump up from 30 seconds to 18 seconds. Aim was set at 28 seconds. Aim was met on the 18th session of the baseline phase. Since Mary met aim in the first few weeks of baseline, no picture cue training was implemented.

**Maintenance Caregiver Training.** For 3 weeks following the picture cue training a maintenance phase began. The caregivers were taught the techniques used by the experimenter during the study in the maintenance condition. Three sessions, once a week of maintenance data was collected. This phase showed corrects multiplying by 1.0 and remaining at aim. The median number of learning opportunities per minute remained 0 and record floors remained stable at 18 seconds. Mary continued to perform at aim.

**Baseline Least-to-most Response Prompts Socks.** A total of 42 baseline sessions were conducted in this condition. The median number of learning opportunities (i.e., incorrect steps) per minute was 1 the first 4 weeks and 0 during the remaining period of baseline. Mary's weekly celeration for corrects multiplied by 1.0. Her baseline performance change (i.e., the distance between the low and high frequency) multiplied by 1.0. There was variability
in the record floor time with a range of 12 seconds to 30 seconds. The record floor aim was set at 24 seconds with a frequency aim of 7 steps. Aim was met immediately thus eliminating the implementation of the picture cue training.

**Maintenance Caregiver Training.** During the 3 weeks following the picture cue training a maintenance phase began. The caregivers were taught the techniques used by the experimenter during the study in the maintenance condition. Mary's behavior showed a lot of variability as is seen by Figure 2.3. There was a decline in her performance which resulted in a decrease in the rate in which she completed the task. This phase showed corrects multiplying by 1.0 and remaining at aim. The median number of learning opportunities per minute remained 0 and records floors were variable. Due to the few data points no conclusive information can be supported regarding the record floors.

**Baseline Least-to-most Response Prompts Shoes.** Mary P. had a total of 42 baseline sessions. The median number of learning opportunities (i.e., incorrect steps) per minute was 3 the first 5 weeks and 0 the remaining weeks. The weekly celeration for corrects multiplied by 1.0. Her baseline performance change (i.e., the distance between the low and high frequency) multiplied by 1.0. The record floor was stable the first 3 weeks with a jump up evident in the second week with a gradual decrease in time from 42 seconds to 14 seconds. Aim was set at 12 seconds for the shoes task. The record floor aim of 12 seconds was met in the fourth week thus eliminating the implementation of the picture cue training. The aim for correct frequencies was 7 steps.
**Maintenance Caregiver Training.** For 3 weeks following the picture cue training Mary began the maintenance phase. During maintenance the caregivers were taught the techniques used by the experimenter during the study. Three sessions, once a week, of maintenance data was collected. This phase showed corrects multiplying by 1.0 and remaining at aim. The median number of learning opportunities per minute remained 0 and record floors remained stable at 12 seconds. Aim continued to be met.
Figure 2.0
Figure 2.1

Mary P. Pull-over
Maintenance Caregiver Training

Figure 2.1
Figure 2.2

Mary P. Stacks

Maintenance Caregiver Training

x 1.0

Figure 2.2
Figure 2.3
Figure 2.3

- Maintenance Career Training
- Counting Period Floors
- May P.
- Socks
- EAC
- 19 May 91
- 16 Nov 91
- 16 Nov 90
- 6 Oct 90

The diagram illustrates a time line with dates and events, possibly related to a project or plan. The specific dates and events are not legible in the image.
Figure 2.4
Florence J.

Figures 3.0 to 3.3 illustrates the performance of Florence on these major tasks which includes, underclothes, dress, stockings, and shoes.

**Baseline Least-to-most Response Prompts Underclothes.** Florence had a total of 17 baseline sessions. The median number of learning opportunities (i.e., incorrect steps) per minute was 0. She completed the task without any prompts. The weekly celeration for corrects multiplied by 1.0. Her baseline performance change (i.e., the distance between the low and high frequency) multiplied by 1.0. The record floor was stable with a gradual decrease from 1 minute and 10 seconds to 50 seconds. Aim for the record floor was set at 42 seconds and the aim for correct frequencies was 32 steps. Florence did not meet aim.

**Picture Cues.** Florence had a total of 6 picture cue sessions. Florence’s weekly learning celeration for correct steps per minute multiplied by 1.0. Once picture cue training was introduced there was little improvement in Florence’s performance. Aim was never met.

**Maintenance Caregiver Training.** For 3 weeks following the picture cue training Florence began the maintenance phase. During maintenance the caregivers were taught the techniques used by the experimenter during the study. Three sessions, once a week, of maintenance data was collected. This phase showed corrects multiplying by 1.0 and aim still was not met. The median number of learning opportunities per minute remained 0 and record floors remained stable at 50 seconds.
**Baseline Least-to-most Response Prompts Dress.** Florence had a total of 15 baseline sessions. The median number of learning opportunities (i.e., incorrect steps) per minute was 0. She completed the task without any prompts. The weekly celeration for corrects multiplied by 1.0. Her baseline performance change (i.e., the distance between the low and high frequency) multiplied by 1.0. The record floor was stable the first 2 weeks with a gradual decrease from 1 minute to 45 seconds. A record floor aim was set at 14 seconds. Florence did not meet aim.

**Picture Cues.** Florence had a total of 12 picture cue sessions. Florence's weekly learning celeration for correct steps per minute multiplied by 1.0 during the weeks of picture cue training. There was variability in Florence's performance during this phase. Aim was not met.

**Maintenance Caregiver Training.** For 3 weeks following the picture cue training Florence began the maintenance phase. During maintenance the caregivers were taught the techniques used by the experimenter during the study. Three sessions, once a week, of maintenance data was collected. This phase showed corrects multiplying by 1.0. The median number of learning opportunities per minute remained 0 and record floors remained stable at 15 seconds. Aim was not met during this phase.

**Baseline Least-to-most Response Prompts Stockings.** Florence had a total of 16 baseline sessions. The median number of learning opportunities (i.e., incorrect steps) per minute was 0. She completed the task without any prompts. The weekly celeration for corrects multiplied by 1.0. Her baseline performance change (i.e., the distance between the low and high frequency) multiplied by 1.0. The record floor was stable after the first week with times
ranging from 1 minute to 1 minute 30 seconds. The record floor aim was set at 24 seconds with the aim for correct frequencies at 7 steps. Florence did not meet aim.

**Picture Cues.** Florence had a total of 12 picture cue sessions. Florence's weekly learning celeration for correct steps per minute multiplied by 1.3 during the weeks of picture cue training. During the final weeks of this condition, her frequencies showed a decrease in the record floor time of 45 seconds to 16 seconds on the last 4 sessions.

**Maintenance Caregiver Training.** For 3 weeks following the picture cue training Florence began the maintenance phase. During maintenance the caregivers were taught the techniques used by the experimenter during the study. Three sessions, once a week, of maintenance data was collected. This phase showed corrects multiplying by 1.0 and remaining below aim. The median number of learning opportunities per minute remained 0 and record floors remained stable at 13 seconds.

**Baseline Least-to-most Response Prompts Shoes.** Florence had a total of 30 baseline sessions. The median number of learning opportunities (i.e., incorrect steps) per minutes was 0. She completed the task without any prompts. The weekly celeration for corrects multiplied by 1.0. Her baseline performance change (i.e., the distance between the low and high frequency) multiplied by 1.0. The record floor was stable the first 4 weeks with a slight up from 26 seconds to 18 seconds. The record floor aim was set at 24 seconds and the aim for correct frequencies was 6. Florence met aim on the 18th session. Since Florence met aim in the 5th week therefore no picture cue training was implemented.
**Maintenance Caregiver Training.** For 3 weeks following the baseline phase Florence began the maintenance phase. During maintenance the caregivers were taught the techniques used by the experimenter during the study. Three sessions, once a week, of maintenance data was collected. This phase showed corrects multiplying by 1.0 and remaining at aim. The median number of learning opportunities per minute remained 0 and record floors remained stable at 12 seconds. Aim continued to be met.
Figure 3.0
Figure 3.0

Florence J. Underclothes

Behavior Age Label Counted

University Carolyn T-Johnson Carolyn T-Johnson Carolyn T-Johnson

Timer Counter Charter

Figure 3.0
Figure 3.1
Figure 3.1

Florence J. Dress

Maintenance Caregiver Training

x 1.0

Timer Counter Chatter

SUCCESSIVE CALENDAR DAYS Florence J. 88 Alzheimer's

Behavior Age Label Counted

Intensity Carolyn T-Johnson Carolyn T-Johnson Carolyn T-Johnson

Timer Counter Counter

Figure 3.1
Figure 3.2
Figure 3.2

Maintenance Caregiver Training

Florence J. Stockings

M.S. T.-Johnson
SUCCESSIVE CALENDAR DAYS Florence J. 83 Alzheimer's Stockings
Manager Behavior Age Label Counted

Illinois State University Carolyn T.-Johnson Carolyn T.-Johnson Carolyn T.-Johnson
Agency Timer Counter Charter

Figure 3.2
Summary

The data show that picture cue training can be an effective strategy to improve the dressing skills of persons with Alzheimer's disease. Even though all 3 participants were in the middle stage of the disease, they were in various stages of that middle phase. Mary B. could dress independently however she had difficulty selecting the appropriate clothing. Florence could also dress independently but often she layered her clothing or tried to put on clothing that was not appropriate for the season. Mary P. had difficulty seeing and required the prompts regularly.

In all 3 participants the need for picture cues was not consistent across the dressing tasks. Most of the participants only required that the picture cues be used on those skills in which the aim goals were not met. The performance change for the 3 participants generally showed an increase in the functioning ability of the participants. During the maintenance and caregiver training phase, the Mary B. was the only one that maintained the performance levels, however she regressed and was again attempting to put on the same outfit everyday.

Florence's data shows variability in the performance due to the fact that she was going through physical changes. Her medication had been changed and her body was responding to that change.

Mary P. did not show maintenance either. She was becoming less capable of performing without the assistance of her husband. Mary's vision was getting worse and she relied heavily on her spouse for assistance throughout the day. Mary also was not able to remember her spouse or children on a regular basis.
Caregiver Opinion of Picture Cue Training

Table 6 represents a summary of the caregiver's opinions of the picture cue training and system of least-to-most response prompts of the person with Alzheimer's disease. All of the caregivers were pleased to have had assistance with their family member. Mary B.'s daughter-in-law was especially pleased, as she and Mary did not get along. The daughter-in-law informed me that she was afraid of her mother-in-law. One day the day center found a knife in Mary's purse which frightened the daughter-in-law. Mary P.'s husband was also thrilled as it allowed him the opportunity to relax after the interobserver agreement measures were taken and before he and Mary had their breakfast. Florence's daughter was not in good health and she was difficulty managing her mother by herself. The assistance with the dressing skills proved helpful.

All of the caregivers responded positively toward the study and basically were pleased with the results, the improvement in the dressing skills of their family member and better grooming skills.
<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>noticeable improvement in dressing skills</td>
<td>3</td>
</tr>
<tr>
<td>participant can button, zip, tie</td>
<td>2  1</td>
</tr>
<tr>
<td>participant can dress within 20 minutes</td>
<td>3</td>
</tr>
<tr>
<td>participant likes to look nice</td>
<td>3</td>
</tr>
<tr>
<td>participant can identify clothing</td>
<td>2  1</td>
</tr>
<tr>
<td>participant is involved in daily activities</td>
<td>2  1</td>
</tr>
<tr>
<td>colors and patterns are confusing</td>
<td>3</td>
</tr>
<tr>
<td>participant selects own clothing</td>
<td>2  1</td>
</tr>
<tr>
<td>participant assists in selecting clothing</td>
<td>3</td>
</tr>
<tr>
<td>participant layers clothing</td>
<td>1  2</td>
</tr>
<tr>
<td>can dress without assistance</td>
<td>2  1</td>
</tr>
<tr>
<td>puts shoes on right feet</td>
<td>2  1</td>
</tr>
<tr>
<td>puts right clothes on without assistance</td>
<td>2  1</td>
</tr>
</tbody>
</table>
Collateral Development Assessment

A 10-item check list assessment was completed daily by the caregivers to evaluate the stability of the daily self-help at meal time. The caregivers provided a rating of the eating skills during breakfast.

Mary B. Mary B. was able to feed herself without assistance at the start of the study. She was able to feed herself using a spoon and sometimes her fingers, however there was significant spillage of the food in the eating process. Her daughter-in-law noted that she ate very fast and generally she ate all of her food. At times though, she would eat, go upstairs to her room, and then go to the restroom and regurgitate the food. This behavior was maintained throughout the study. On one occasion the family went to dinner at a restaurant and Mary began eating her food with her hands and attempted to make a sandwich out of her meatloaf, fish, and dressing. During the same week as she was preparing for church, she put on a blouse and buttoned it completely, and then she put on another blouse on top of it. This was not the typical dressing pattern for her.

Mary P. Mary P. was able to feed herself with minimal assistance at the beginning of the study. She was able to use the utensils, but she needed assistance in the selection of the utensils. Mary had significant spillage as she ate, which could be contributed to her vision problems. She had no problems chewing her food and generally she ate all of the meal. Mary P. had a good appetite and frequently she inquired about the breakfast menu while she was dressing. During the 11th week of the study, her husband had to assist her more frequently as she was forgetting how to eat and she did not know how to use the utensils. There was also digression shown in her ability
to dress as she was unable to determine which piece of clothing was appropriate and relied on her husband for assistance.

Florence J. Florence was able to feed herself and she enjoyed eating good food. At the beginning of the study the daughter did not assist her in any manner during the eating process. Sometimes she did not recognize the correct utensil and occasionally there was spillage of food. Toward the latter weeks of the study the daughter stated that Florence did not recognize what she was eating, not did she know which utensil to use. She was not able to take her medication and she did not adhere to simple commands (e.g., "Mom, pull your chair up to the table."). The daughter had to chop her medication up and put it in her mouth. Her dressing skills were also deteriorating and she required constant monitoring as she was becoming more confused and disoriented on a daily basis. Florence was incontinent at times and she did not seem to recognize the restroom. She had periods of anxiety and restlessness. There was a change in her medication during this period which could be related to some of her behavioral patterns.
CHAPTER V
DISCUSSION

This chapter will discuss the results from a least-to-most response prompt strategy and picture cues in the development and maintenance of dressing skills of 3 participants with Alzheimer's disease. The discussion will include answers to the research questions, the limitations of the study, the implications for applied practice, and suggestions for future research.

Research Question One

Will picture cues be functionally related to dressing skills of participants with Alzheimer's disease? Mary P. benefited greatest from the picture cues due to her inability to focus accurately on clothing items. Picture cues proved valuable in the tasks for underclothes and top (pull-over or button blouse). She had to use prompts to complete the rest of the dressing tasks. She could not dress independently without some assistance. Picture cues were implemented for Mary B. to increase the rate of response for the top (pull-over and button-up blouse) and for stockings, specifically knee-hi's. Mary B. was able to dress independently, however she frequently forgot what clothing she had selected for the day. Florence was helped with picture cues in the completion of the tasks for dress or duster, stockings, and underwear. Florence was dressing independently but she frequently had to be redirected to the task at hand. She talked constantly throughout the training period and was easily distracted.
Summary. This study illustrated that picture cues can be functionally related to the dressing skills of persons with Alzheimer's disease. The three participants were all in the middle stage of the disease, however they were in various stages of the middle phase. This attributed to the ability of the participants to complete the tasks independently or with prompts from the experimenter. The system of least-to-most prompts were effective in the dressing skills of the participants. To date there is no literature that has investigated a response prompting procedure in conjunction with picture cues with the elderly population. These findings are consistent with those of Bourgeois (1986), who found that Alzheimer's participants' use of a pictorial wallet memory device helped to increase their conversational skills with loved ones. A notable difference in the present study is the emphasis on the dressing skills in the use of picture cues with least-to-most response prompts. It is also consistent with a studies by Hanley and Lusty (1984), who successfully trained dementia patients to maintain orientation skills using memory aids. Mary B. and Mary P. were in baseline longer than Florence J., however the results were the same. The majority of the research with these techniques have been implemented with individuals with special needs, specifically the severely disabled. However in observing the data it is possible that the least-to-most response prompts are sufficient in itself to maintain appropriate behavior. The value of this technique is also seen in the acquisition of aims by the participants in most cases in a relatively short period of time. Not only were aims met but occasionally the participants went beyond the aims established by the experimenter's fluency of dressing. For example Florence surpassed aim in her stockings dressing task during the picture cue training with the use of the
least-to-most response prompts. Mary P. passed the frequency aims in her pull-over top dressing task during the picture cue training also, and the slacks and socks dressing tasks went beyond the aims in the baseline phase. Mary B. went beyond the aim frequencies in her slacks and shoes dressing task.

The experimenter was able to increase the quality of the conversation of participant 1 by spending 15 minutes daily quizzing her on the date (in which she marked off the calendar), her activities at the day center and viewing pictures and memorabilia of her family members. Often she told stories about her loved ones and her life with her husband.

The spouse of participant 2, the caregiver, was extremely pleased with the training and often shared with the support group how he had forgotten how beautiful his wife was and how that original love had been renewed when he saw her coming down the steps dressed appropriately and well groomed. This was a pleasant and surprised result of the treatment procedures.

**Research Question Two**

*If picture cues improve dressing skills of the participants will that improvement be maintained?* Follow-up data were collected on 3 different sessions for the participants. Mary B. maintained the frequency and the accuracy of steps on all of the dressing tasks. There was some variability in the performance of Mary P. in the follow-up data. This was illustrated in the fact that she was digressing rapidly and loosing the ability to perform independently in various skills (eating, walking, etc.). Mary P.'s husband said that she was becoming more agitated and seemed to be disoriented on a regular basis. He felt that there was little processing of information and she appeared not to recognize familiar persons (e.g., her children). Florence was able to maintain
during the caregiver training. She had some variability in her performance which can be seen in her last few weeks of daily completion of the dress, stockings, and shoe tasks. It was becoming increasingly difficult for Florence to function and perform in a consistent manner. Her daughter stated that she is disoriented frequently and she is unable to recognize items (e.g., utensils for eating) and the daughter often has to prompt her to eat. In her dressing tasks she would put her stockings over her shoes or put her purse over her legs and try to tie the straps of the purse like one would shoestrings. There was a change in the medication Florence was taking for anxiety and some of these behavioral patterns could be attributed to the medication. Specific remedies of demonstrable benefit for the cognitive defects and the biological abnormalities of Alzheimer's disease are not yet available (Winters-Miner et. al., 1989). However medications are used to counteract disabilities that would otherwise impede the functioning abilities in a patient. Classic indications would be sleeplessness, anxiety, depression, psychosis, uncontrolled and aggressive behavior, and wandering. Florence J. had been on medication for a period of years. In the first stages of the disease, a medication was prescribed in which the dosage was too high and caused her to function in a lethargic, semi-conscious state, for periods of time. Her daughter stated that Florence's current behaviors were reminiscent to the earlier days. Her physician has modified the dosage. It is impossible to predict the effects medications have on the functioning capabilities of persons with Alzheimer's disease.
Summary. Due to the nature of Alzheimer's disease and the progressive mental deterioration persons gradually begin to experience increasingly serious difficulties in making appropriate decisions and judgments regarding their own personal physical care. It is not likely that persons will maintain behavior over an extended period of time. However it is possible and profitable to provide them with the necessary skills for independent functioning as long as possible. Florence J. and Mary P. were rapidly moving into the final stage of the disease. There was a noticeable difference in their ability to walk, their gait was unsteady and they were easily agitated. They both were becoming less and less sensitive to their environments and their sleeping patterns had changed dramatically. An important variable that must be investigated in the disease the effect of medications on the persons with Alzheimer's disease, especially when multiple medications are prescribed.

Research Question Three

If picture cues improve dressing skills during morning care, will that improvement transfer to evening care in the absence of additional training during the evening hours? Mary P. could not dress independently during the evening hours. Mary's vision problems and her inability to relate to her husband and items (e.g., furniture, restroom,) interfered with her ability to function within the home without constant supervision. Her husband continued to dress her as he felt it was better for him than to have to monitor and redirect Mary's behavior. Mary P. had high and low periods; during the low periods she was anxious and depressed. Mary B. was able to dress in the evening and required no assistance from the caregiver. Mary B. regressed
during the maintenance phase of the study. She returned to the behavioral patterns that were common prior to the beginning of the study (e.g., wearing the same clothing daily). Florence had to be monitored as she regularly changed clothing during the day and often layered the clothing that she put on. Florence's medication was changed because of her anxiety attacks and sleeplessness during the night. The day care complained that she was becoming aggressive with the other clients at the center and difficult to control.

**Summary.** Both Mary B. and Florence J. continued to dress independently during the evening hours. Mary B. would generally wear the same clothing and she did not attempt to match clothing appropriately (e.g., blue slacks with black blouse). Florence J. changed clothing at least 2 to 3 times during the evening hours and she frequently layered the clothing that she put on, including headwear (e.g., 2 winter hats on top of each other). The picture cues only showed the individuals in one outfit during various stages of the dressing process. Mary B. and Florence J. did use the picture cues on some of the dressing tasks, but there was no follow through in the evening hours.

**Limitations of the Study**

The limitations of this study include caregiver cooperation, improving baseline, generalization and maintenance, motor and intellectual functioning, sample restriction, and time of day.

**Caregiver Cooperation**

The experimenter interviewed a total of 25 caregivers and their family members with Alzheimer's disease. Ten of the caregivers were interested in the training and allowed their family member to be
assessed during the prebaseline treatments. It became apparent that the caregivers did not want an interruption in their daily schedules and were reluctant to allow the experimenter to continue. One caregiver explained that she had developed a routine and that my training program would be too cumbersome and her family member would have to be retrained. Most of the caregivers reported hassles with care recipient's behaviors, such as lack of cooperation, repetitive questioning, the need for assistance with their dressing, bathing, and toileting.

The three caregivers, a daughter-in-law, a husband, and a daughter were willing to have their caregiver recipient participate in the study. However all caregivers were concerned when the participants did not respond to them with the same cooperation as they gave to the experimenter. The caregivers expressed a desire for assistance in the dressing skills of their family member. Mary B. always wore the same outfit to the day care center and she refused to cooperate with her daughter-in-law when she tried to suggest that she change clothing. Mary B. was receptive to the training initiated by the experimenter. Mary P's husband dressed her daily and he tried to prepare her breakfast also. He often had difficulties completing all the tasks during the morning hours. Mary P. enjoyed working with the experimenter even though her vision problems prevented her ability to complete tasks. Florence J.'s daughter was not in good health and it was difficult for her to monitor her mother at all times. Florence was quite active and frequently wandered throughout the apartment. The training
procedures for the caregivers was successful even though concern was expressed about the time allotment (15 minutes maximum) to complete the total dressing task. All 3 of the participants attended a day care and it was important that the family member be on a punctual schedule. If possible an alternate person should be available to alleviate some of the responsibility of the caregiver.

Improving Baseline

The second limitation was the improvement of baseline conditions. Each participant reached the established performance aim with the least-to-most response prompts on some of the tasks. This was an unexpected outcome since the participants were not dressing appropriately at all times. Experimental control could not be established with the planned independent variable because there was not a functional relationship between the independent variable (e.g., picture cues) and the dependent variable (e.g., completion of steps in the task analysis). All participants reached frequency and record floor aims on at least one of the tasks without the application of the independent variable. For those tasks that did not require picture cue training, the least-to-most response prompts were sufficient in the acquisition of the correct performance of the steps within a task.

Maintenance

Mary P. did not maintain her fluency of dressing after the experimenter withdrew her help and instituted the caregiver training for maintenance. During the maintenance condition, Mary P.'s husband dressed her because her vision problems worsened and it was easier for him and required less time because he did not have to monitor Mary. He wanted to get Mary P. on a schedule that
was conducive to a time frame that allowed him to get her washed, dressed, groomed, and an opportunity to eat, within a span of half an hour.

Mary B. maintained during the caregiver training condition. Her daughter-in-law stated that she started selecting the same piece of clothing and she was resistant to suggestions from family members. The daughter-in-law attempted to change the behavior without much success.

Florence J. was successful in the caregiver training condition for the underclothes, dress, stockings, and shoes tasks. She continued to change clothing often during the evening hours and frequently she put on layers of clothing (e.g., blouse, shirt, coat) and inappropriate clothing (e.g., winter hats and scarves).

**Motor and Intellectual Functioning**

The participants were in the middle stage of Alzheimer's disease. Due to the idiosyncratic nature of the disease they were all functioning at different levels within that middle stage. Mary P. and Florence J. were more toward the last phase of the middle stage, whereas Mary B. remained in the middle stage in which she maintained several independent skills. Mary B. and Florence J. could dress themselves independently therefore the picture cue training was not a functional variable in the dressing process. Even though they could dress independent they had difficulties: (a) in selecting the appropriate clothing; (b) in selecting different clothing; and (c) in their grooming skills (e.g., combing their hair after putting on a pull-over sweater). The disease prevented the participants from functioning at an appropriate level most of the time. For instance, when Mary P. was instructed to pick up the sock, she picked it up and put it on her hand. There
were also mornings when her visual problems prevented her from focusing on the objects and she had to feel the clothing to determine what it was. To what extent the disease affected the functioning abilities of the participants is unknown.

**Sample Restriction**

The fifth limitation was sample restriction. The sample was restricted to examining patients with senile dementia of Alzheimer's disease and did not include patients with other dementing disorders such as multi-infarct dementia, Parkinson's disease with dementia and Huntington's disease, etc. Results might have been different had other dementia diseases been included.

**Time of Day**

The last limitation of the study was the time of day selected for intervention. It was important for the experimenter to be in the home when the participant awoke each weekday morning. Mary B. awoke between 5:30 and 6:00 and often when the experimenter arrived, she was already dressed. The van for the day care did not pick her up until 8:30 and the caregiver frequently was upset because Mary wandered around the house anxiously awaiting the van. Several times during the collection of data, Mary awoke at 4 o'clock in the morning and was redirected back to her bedroom by her son. She remained dressed and just sat on her bed. This limitation caused the experimenter to miss days of data collection as well as one of the dressing tasks, specifically underclothes. Mary P. generally arose around 6:00 o'clock to use the restroom and she generally went back to bed. When the experimenter arrived around 7:15 she
often did not want to get up and was resistant to cooperating. She complained about being tired and needing more sleep. Her mood swings were quite noticeable when she was sleepy or drowsy and on those days she was less likely to cooperate. These mood swings may have influenced her fluency of dressing. Florence J. awoke early also and she would get up wash and dress sometimes, then she would go back to bed. The experimenter had to select more clothing for her because she would go in the restroom to wash and wash out her clothes as well. This occurred on a regular basis. Results might have been different had the training sessions been at another time, such as later in the morning. All 3 participants might have been more cooperative.

**Implications for Applied Settings**

The elderly often require assistance to acquire new skills. Prompts (Foxx, 1982; Snell, 1987) are extra stimuli provided to increase the likelihood that the individual will perform the behavior. The system of least-to-most prompts is a viable approach to increase the dressing skills of persons with Alzheimer's. This population is living longer. Better technology is needed to address the needs of these persons. Procedures that may be effective are the least-to-most response prompts and picture cues. Research indicates that providing care for a chronically ill and disabled older adult can produce a great deal of stress for in-home family caregivers (Linsk, et. al., 1982). Common problems reported by these caregivers include depression and anxiety, as well as disruption in their social lives.

During the last ten years, Alzheimer's disease has gone from being an understudied problem to being a fashionable one (Miner, Winters-Miner, Blass, Richter, & Valentine, 1989). Persons with
Alzheimer's disease experience gradual mental deterioration that affects their ability to perform routine physical tasks and to relate to their closest family members; the period that they live beyond the loss of these capacities is often years. It is difficult for family members to manage the stage between which the person with Alzheimer's disease retains strong will and physical capability but loses rational process. The literature (e.g., Linsk, et. al., 1982; Pinkston, et. al., 1988) clearly supports that elderly people respond well to change programs. The fact that caregivers can be trained to implement behavioral programs reliably in the home was illustrated in the acquisition of training procedures by the family members (Bourgeois, 1990).

The literature in the field of behavioral gerontology is improving and in the past 7 years there has been a re-emergence of behavioral study of the aging (Carstensen, 1988; Burgio, 1986). Many behaviors have been selected for treatment including incontinence, self-injury, self-management, recreational skills, eating, dressing, cooking, and bathing. Response prompts and picture cue training will assist in increasing the independent dressing skills of persons with Alzheimer's disease.

Suggestions for Future Research

This study evaluated the effectiveness of a treatment designed to improve the dressing skills of persons with Alzheimer's disease. All participants showed improvement in their dressing skills, either in the sequence of steps or in the rate in which they completed the steps.

There is little research in the area of behavioral gerontology with persons with Alzheimer's disease. Suggestions for future research would include the following. A replication of the present study would prove valuable
but with a no help baseline. There could be no assistance from caregivers or an experimenter, but only response prompts to test the true effect of the response prompts procedures. It is often necessary to increase the behavioral repertoires of elderly persons, including those with Alzheimer's disease. To assist elderly individuals to achieve goals, a practitioner may often need to use prompts associated with the response, such as verbal instructions, modeling, or physical guidance, to increase the probability that a specific response will occur and therefore be reinforced. The prompting system could be used to increase skills that are essential to daily living within communities.

Another possibility would be to replicate the present study with the independent variable being the picture cues and no prompting system in the baseline period. This would also show the value of the picture cue training.

Future research could address the same dependent variable but during the evening hour rather than morning because of the problems discussed in the limitations. Possibly this would improve the temperance of the participants, however many persons with Alzheimer's disease experience the syndrome of "sundowning", which causes the participant to become more anxious and agitated during the late afternoon and evening hours.

Another possibility would be to investigate the use of response prompts and discrimination training in the acquisition of clothing selection (e.g., different and appropriate). This would be essential in the behavioral patterns of persons with Alzheimer's disease since the selection of clothing is a complicated and difficult task.
The experimenter intervened on the dressing skills of the participants but she also supervised the grooming behaviors (e.g., brushing teeth, washing face, and combing hair). Future research could use response prompts to teach grooming skills, which often are neglected by the participants.

Since there is little research in the area of Alzheimer's disease, it would be interesting to investigate this same procedure with persons in the beginning stages to test the validity of intervening on a behavior prior to the onset of functioning abilities. Since basically the participants used in this study could dress it might be feasible to identify participants in the last phase of the disease to see if a functional relationship could be shown between the picture cues and the completion of the steps within a task.

Research has shown (Linsk, et. al., 1982; Hussian, 1981; Pinkston & Linsk, 1984; Pinkston, et. al., 1988; Burgio, et. al., 1986) that caregivers can be trained in behavioral applications with the elderly. Future research should investigate ways to teach caregivers to help in the maintenance of behavioral programs. It is important that participants maintain contact with familiar persons in their environments which generally is the caregiver. The caregiver can train their family member in the acquisition and maintenance of skills. An alternative individual should also be trained to alleviate some of the stress that caregivers often develop in their role as primary caregiver.

**Summary**

This study evaluated the effectiveness of a treatment designed to improve the dressing skills of persons with Alzheimer's disease. All participants showed improvement in their dressing skills, either in the sequence of steps or in the frequency in which they completed the steps.
Practical reasons have led some persons to avoid or abandon the area of behavioral gerontology. Beyond the obvious limitations such as inconvenient access to subjects, and transportation problems, work with the elderly often demands a modified perspective on treatment procedures and treatment goals. Improvement in the behavior problems of Alzheimer's persons, for example may fail to continue once an illness progresses. (Carstensen, 1988).

Gerontology has been emerging as a legitimate area of study within psychology for the past 30 years (Storandt, 1983). Yet behavioral psychologists have been reluctant to incorporate the study of aging and the aged into standard topical areas of training and specialization (Carstensen, 1988). There is limited research conducted to date on response prompting with this population. Further research is needed to strengthen the recommendations for practitioners. If instruction is focusing on fluency, the the least-to-most response prompt technique is the most efficient in achieving an instructional goal.

There is a growing body of research on picture cues with older adults. Pictorial materials have been more effective in increasing memory in older individuals than verbal instructions. Studies have shown that contextual variables present in pictures are potentially important determinants of memory in elderly adults and worthy of future research. Much of the context in our everyday memory environment is visual in nature, yet there is little research available on the use of pictorial context stimuli by older adults (Park, et. al., 1990).

One common theme that permeates the body of intervention research is that the basic principles that work with the young also work with the old.
With the exception of research on dementia, the intervention literature remains quite small relative to the research conducted with younger populations. Only recently has the systematic study of the effects of behavior therapy with the elderly been undertaken. Two stumbling-blocks are the generalization and maintenance of treatment gains. One can only speculate why, but progress made by elderly persons often does not maintain.

Since little research has been completed with this population through the behavioral literature, there is a definite need to investigate further research with the elderly, specifically those with Alzheimer's disease.


Consent Form

I agree to allow my family member to participate in a research study investigating an instructional strategy least-to-most prompts with written instructions with the dressing skills of Alzheimer's persons and its effectiveness with picture cues. This study will be conducted in the homes of the participants by Carolyn Talbert-Johnson, under the direction of Dr. John O. Cooper, Professor of Special Education, The Ohio State University, and will begin on February___________.

I understand that the identity of my family member will not be revealed in any publication, document, recording, videotape, photograph, computer storage, or any other form of report developed from this research. I also understand that I may withdraw my consent for my family member's participation at any time.

I understand that all photographs will be returned to my family member or caregiver and all negatives will be destroyed.

______________________________
Name of Participant

______________________________ Date
Signature of Caregiver

______________________________ Date
Investigator
APPENDIX B

GUIDELINES FOR CLOTHING
Guidelines for Clothing

1. Buy clothing a size larger than normal; this allows for easier access for the person.

2. Buy clothing that is comfortable and easy to care for (i.e., no ironing).

3. It would be wise to replace zippers with velcro closures and elasticized waistbands.

4. May want to invest in brassieres that fasten in the front, which allows for easier access.

5. Use snaps rather than buttons.

6. Garments (e.g., blouses, sweaters) with front closings are better than garments with back closings.

7. Slip on shoes or slippers are advised rather than shoes that buckle or tie.

8. Cardigan sweaters are better than pullovers.

9. Plain clothing or clothing with few patterns are better as they result in less confusion for the person.
APPENDIX C

TASK ANALYSIS
<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>&quot;Select&quot; the written instructions (or picture cues).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Sit on the bed.</td>
<td></td>
<td></td>
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<tr>
<td>3.</td>
<td>Pick up the brassiere.</td>
<td></td>
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<tr>
<td>4.</td>
<td>Hold onto the right end of the brassiere.</td>
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<tr>
<td>5.</td>
<td>Bring the right end to the front.</td>
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<tr>
<td>6.</td>
<td>Bend the left arm and grab the left end from the back.</td>
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<tr>
<td>7.</td>
<td>Bring the left end to the front.</td>
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<tr>
<td>8.</td>
<td>Pull the two ends together.</td>
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<tr>
<td>9.</td>
<td>Snap the hooks together.</td>
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<td></td>
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<tr>
<td>10.</td>
<td>Move the brassiere to the correct position.</td>
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<tr>
<td>11.</td>
<td>Grab hold of the right strap.</td>
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<tr>
<td>12.</td>
<td>Put the right arm threw the right strap.</td>
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<tr>
<td>13.</td>
<td>Grab hold to the left strap.</td>
<td></td>
<td></td>
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<tr>
<td>14.</td>
<td>Put the left arm threw the left strap.</td>
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<td></td>
</tr>
<tr>
<td>15.</td>
<td>Pick up the underpants.</td>
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<tr>
<td>16.</td>
<td>Bend over with the underpants in your hands.</td>
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<tr>
<td>17.</td>
<td>Lift right leg and put it into right hole of underpants.</td>
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<tr>
<td>18.</td>
<td>Put the right leg down.</td>
<td></td>
<td></td>
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<tr>
<td>19.</td>
<td>Lift left leg and put it into left hole of underpants.</td>
<td></td>
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</tr>
<tr>
<td>20.</td>
<td>Put the left leg down.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>Bend over and pull the underpants up to the knees.</td>
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<tr>
<td>22.</td>
<td>Stand up.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td>Pull the underpants up to the waist.</td>
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</tbody>
</table>
## Task Analysis For Dressing

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>24.</td>
<td>Sit on the bed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>Pick up the undershirt (or full slip).</td>
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<tr>
<td>26.</td>
<td>Hold up the undershirt (or full slip) over the head.</td>
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<tr>
<td>27.</td>
<td>Pull the undershirt (or full slip) down over the head.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28.</td>
<td>Look for the tag inside the undershirt (or full slip).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29.</td>
<td>Turn the tag to the back.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30.</td>
<td>Put the right arm through the right sleeve (or strap).</td>
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</tr>
<tr>
<td>31.</td>
<td>Put the left arm through the left sleeve (or strap).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32.</td>
<td>Pull the undershirt (or slip) down over the stomach.</td>
<td></td>
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<tr>
<td>Task Analysis For Dressing</td>
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<tr>
<td><strong>Yes</strong></td>
<td><strong>No</strong></td>
<td><strong>Comments</strong></td>
<td></td>
</tr>
<tr>
<td>1. &quot;Select&quot; the written instructions (or picture cues).</td>
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</tr>
<tr>
<td>2. Pick up the shirt, blouse, or pull-over sweater, dress.</td>
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<tr>
<td>3. Grasp shirt (blouse, sweater) by left neck and collar with left hand.</td>
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<tr>
<td>4. Put right arm in right sleeve hole.</td>
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<tr>
<td>5. Grasp left sleeve with the right hand.</td>
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<tr>
<td>6. Push left arm through left sleeve hole.</td>
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<tr>
<td>7. Position the shirt (blouse, sweater) correctly.</td>
<td></td>
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<tr>
<td>8. Grab hold of the right and left top of shirt (or blouse).</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>9. Put the left hand on the top button and the right hand on the top button hole.</td>
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<tr>
<td>10. Put the button through the button hole.</td>
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<tr>
<td>11. Continue until all buttons are buttoned.</td>
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<tr>
<td>12. Pick up the top.</td>
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<td></td>
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<tr>
<td>13. Grab hold and pull the top over the head.</td>
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</tr>
<tr>
<td>14. Put right arm in sleeve.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Put left arm in sleeve.</td>
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<td></td>
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<tr>
<td>16. Pull top down in place and position correctly</td>
<td></td>
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</tr>
<tr>
<td>17. Put button(s) through button hole(s).</td>
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</tbody>
</table>
### Task Analysis For Dressing

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Yes</th>
<th>No</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>&quot;Select&quot; the written instructions (or picture cues).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Sit on the bed.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Pick up the slacks, pants, or skirt.</td>
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<td></td>
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<tr>
<td>4.</td>
<td>Hold the slacks, pants, or skirt.</td>
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<tr>
<td>5.</td>
<td>Check to see if the tag is on the inside of the clothing.</td>
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<tr>
<td>6.</td>
<td>Hold the slacks or pants and put the right leg in the right pants leg.</td>
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<tr>
<td>7.</td>
<td>Hold the slacks or pants and put the left leg in the left pants leg.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Pull the slacks or pants up to the knees.</td>
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<td></td>
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</tr>
<tr>
<td>9.</td>
<td>Stand up.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>10.</td>
<td>Pull the slacks or pants up to the waist.</td>
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<tr>
<td>11.</td>
<td>Hold the skirt and step into it with your right leg.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Hold the skirt and step into it with your left leg.</td>
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<tr>
<td>13.</td>
<td>Pull the skirt up to the waist.</td>
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<tr>
<td>14.</td>
<td>Hold the zipper and pull it all the way up.</td>
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<tr>
<td>15.</td>
<td>Put the left hand on the button.</td>
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<tr>
<td>16.</td>
<td>Put the right hand on the button hole.</td>
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</tr>
<tr>
<td>17.</td>
<td>Put the button through the button hole.</td>
<td></td>
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</tbody>
</table>
### Task Analysis For Dressing

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>&quot;Select&quot; the written instructions (or picture cues).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Sit on the bed.</td>
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<td></td>
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</tr>
<tr>
<td>3.</td>
<td>Pick up the stockings/knee hi's.</td>
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<tr>
<td>4.</td>
<td>Hold the stockings in the air.</td>
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<tr>
<td>5.</td>
<td>Lift the right foot and put into the right foot of the stockings/knee hi's.</td>
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<tr>
<td>6.</td>
<td>Pull the stockings/knee hi's up onto the right leg.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>7.</td>
<td>Lift the left foot and put into the left foot of the stockings/knee hi's.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Pull the stockings/knee hi's up onto the left leg.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Pull the stockings/knee hi's up to the waist.</td>
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<td></td>
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</tr>
<tr>
<td>10.</td>
<td>Pick up the right sock.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>11.</td>
<td>Lift the right foot and put into the right sock.</td>
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</tr>
<tr>
<td>12.</td>
<td>Pull the sock up.</td>
<td></td>
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<tr>
<td>13.</td>
<td>Pick up the left sock.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>14.</td>
<td>Lift the left foot and put into the left sock.</td>
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<tr>
<td>15.</td>
<td>Pull the sock up.</td>
<td></td>
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</table>
### Task Analysis For Dressing

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Yes</th>
<th>No</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&quot;Select&quot; the written instructions (or picture cues).</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2</td>
<td>Locate the shoes/slippers in the environment.</td>
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<tr>
<td>3</td>
<td>Find the right shoe/slipper.</td>
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<tr>
<td>4</td>
<td>Lift up the right foot and slide it into the right shoe/slipper.</td>
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<tr>
<td>5</td>
<td>Find the left shoe/slipper.</td>
<td></td>
<td></td>
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<tr>
<td>6</td>
<td>Lift up the left foot and slide it into left shoe/slipper.</td>
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</tbody>
</table>
APPENDIX D

READING ASSESSMENT FORM
READING ASSESSMENT

PLEASE READ THE FOLLOWING SENTENCES.

1. Please put on the underwear.

2. Please put on the blouse.
   Please put on the shirt.
   Please put on the sweater.

3. Please put on the slacks.
   Please put on the dress.
   Please put on the skirt.

4. Please put on the stockings.
   Please put on the knee hi’s.
   Please put on the socks.
5. Please put on the shoes.

Please put on the slippers.
# Self-Check Card

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Task Analysis 1 - Underwear</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. brassiere</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. underpants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. undershirt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. slip</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. panty hose</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2. Task Analysis 2 - Top Layer</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. blouse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. blouse snapped</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&amp; buttoned</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. shirt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. shirt snapped</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&amp; buttoned</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. sweater</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. sweater snapped</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&amp; buttoned</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>3. Task Analysis 3 - Lower Layer</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. pants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. pants zipped &amp; buttoned</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. slacks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. slacks zipped &amp; buttoned</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. skirt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. skirt zipped &amp; buttoned</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>4. Task Analysis 4 - Under layer</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. socks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. stockings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. knee hi's</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>5. Task Analysis 5 - Outer layer</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. shoes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. shoes tied or laced</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. slippers</td>
<td></td>
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</tbody>
</table>
APPENDIX F

PROCEDURAL INSTRUCTION CHECKLIST
PROCEDURAL CHECKLIST

1. Remind participants daily who I am and why I am there.

2. Check the tape and start the tape recorder.
   The tape recorder will run the entire session.

3. Turn up the first paper with the written instructions.

4. Greeting. "Good morning (Name). It is time to get dressed."

5. Set stop watch to 10 seconds and time the participant.

6. If the participant does not comply, say
   "Please look at the sentence."

7. If the participant fails to comply provide the verbal prompt.
   "Pick up the (brassiere, etc.)." Task 1
   "Please continue dressing." Task 2 - 5

8. Provide feedback for compliance (e.g., Great job).

9. Wait 10 secs if the participant still fails to comply within
   10 seconds provide graduated guidance.
   Assist the participant with the clothing.

10. Wait 10 secs if participant still fails to comply within
    the 10 seconds provide verbal prompt and graduated guidance.
    "Here's how we put on the underwear."

11. Provide feedback for compliance (e.g., You're doing great).

12. Wait 10 secs for the participant to go to the next step
    in dressing.

13. Repeat the procedures until the participant is completely
    dressed.

14. Remind participant to use self-check card.
    Read with or to the participant.
    "(Name) let's put our checks on the card.

15. Closing. "See you tomorrow."
    Reinforce again for cooperation and compliance.
APPENDIX G

RECORDING FORM
<table>
<thead>
<tr>
<th>Name: Dav:</th>
<th>Date:</th>
<th>Condition:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Picture 1</th>
<th>Picture 2</th>
<th>Picture 3</th>
<th>Picture 4</th>
<th>Picture 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prompt 1</td>
<td>Prompt 2</td>
<td>Prompt 3</td>
<td>Prompt 4</td>
<td>Prompt 5</td>
</tr>
<tr>
<td>Prompt 1</td>
<td>Prompt 2</td>
<td>Prompt 3</td>
<td>Prompt 4</td>
<td>Prompt 5</td>
</tr>
<tr>
<td>Prompt 1</td>
<td>Prompt 2</td>
<td>Prompt 3</td>
<td>Prompt 4</td>
<td>Prompt 5</td>
</tr>
</tbody>
</table>

Prompt 1 = Verbal  
Prompt 2 = Gesture  
Prompt 3 = Verbal & assist
APPENDIX H

CAREGIVER ASSESSMENT FORM
Please circle the best response for each of the following items using the scale described below.

1=Strongly Disagree  2=Disagree  3=Agree  4=Strongly Agree

1. The patient wakes up on his own accord.  1 2 3  4
2. The patient dresses himself/herself.  1 2 3  4
3. The patient dresses without prompting or assistance from a caregiver.  1 2 3  4
4. The patient can button his/her buttons.  1 2 3  4
5. The patient can zip his/her zippers.  1 2 3  4
6. The patient can tie his/her shoe laces.  1 2 3  4
7. The patient can buckle his/her belt.  1 2 3  4
8. The patient can dress him/her self within 20 minutes.  1 2 3  4
9. The patient gets angry if you try to assist.  1 2 3  4
10. The patient dresses him/her self daily without assistance.  1 2 3  4
11. The patient knows left from right.  1 2 3  4
12. The patient knows front from back.  1 2 3  4
13. The patient likes to look nice.  1 2 3  4
14. The patient is able to determine different pieces of clothing (e.g. blouse from a skirt).  1 2 3  4
15. The patient is involved in daily activities (e.g., day care).  1 2 3  4
16. You assist the patient in his/her daily activities.  1 2 3  4
17. Colors and patterns are confusing for the patient.  1 2 3  4
18. You generally lay the clothing out for the patient.  1 2 3  4
19. The patient generally selects his own clothing.  1 2 3  4
<table>
<thead>
<tr>
<th></th>
<th>1=Strongly Disagree</th>
<th>2=Disagree</th>
<th>3=Agree</th>
<th>4=Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.</td>
<td>The patient puts on layers of clothing (e.g., puts on 2 pair of underpants).</td>
<td>1 2 3 4</td>
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<tr>
<td>21.</td>
<td>The patient is able to put on his night clothes without assistance.</td>
<td>1 2 3 4</td>
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<tr>
<td>22.</td>
<td>You assist the patient at least 2 times a week with his/her night clothes.</td>
<td>1 2 3 4</td>
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<tr>
<td>23.</td>
<td>The patient generally coordinates his clothing (e.g., matches solids with solids).</td>
<td>1 2 3 4</td>
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<td>24.</td>
<td>The patient puts his shoes on the right feet.</td>
<td>1 2 3 4</td>
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<td>25.</td>
<td>The patient is generally neat in his/her appearance.</td>
<td>1 2 3 4</td>
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<tr>
<td>26.</td>
<td>The patient has used velcros in clothing articles (e.g., velcros on tennis shoes instead of shoestrings).</td>
<td>1 2 3 4</td>
<td></td>
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</tr>
</tbody>
</table>
APPENDIX I

DATA SHEET-CELERATION CHART
<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Opp.</th>
<th>Acc.</th>
<th>Comments</th>
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APPENDIX J

COLLATERAL BEHAVIOR CHECKLIST