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SELF-REINFORCEMENT IN THE ELDERLY AS A FUNCTION
OF FEEDBACK AND MODELING

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By

Howard R. Weiner

Dissertation Committee:

Richard A. Dubanoski, Chairman
Tom J. Ciborowski
Robert E. Cole
Ronald C. Johnson
Anthony Lenzer

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ABSTRACT

The major purpose of this study was to investigate two antecedent variables that might serve to facilitate self-reinforcement in older adults. Self-reinforcement has been viewed as a possible therapeutic technique for those elderly whose environments are deficient in sources of external reinforcement as compared to younger persons. Specifically, this experiment was designed to test the effects of systematically varied levels of feedback and modeling on the subsequent self-reinforcing behavior of a group of persons aged 65 and older.

The sample was composed of 180 persons, 96 women and 84 men, whose mean age was 71.5 years. The subjects were of multi-ethnic origins, diverse socioeconomic backgrounds, and all were in good health.

The subjects were divided by sex and randomly assigned to one of two modeling conditions (exposure to a model who self-reinforced or did not), and one of three feedback conditions (high positive, low positive, or no feedback). Half the subjects were exposed to a short videotape in which an elderly female model vigorously self-reinforced for achievement at an experimental task, while half the subjects saw the same model perform without self-reward. For the feedback variable, one third of the

subjects received feedback, via a light/chime apparatus, that 95% of their answers were correct at an ambiguous discrimination task, a third received feedback that they were correct on 45% of the trials, while a third received no information about their performance. The modeling and feedback conditions were presented in counterbalanced order. The final phase of the study involved a matching-to-sample task in which subjects could self-reinforce for self-perceived correct responding. The dependent measures were: (a) the number of self-reinforcing responses emitted over blocks of trials, and (b) the number of trials in which self-reinforcement occurred. In addition, measures of self-esteem were taken before and after the experimental manipulations.

The results showed that those subjects who had observed a self-reinforcing model emitted significantly more self-reinforcers and self-reinforced on significantly more trials than did the group who had viewed the non self-reinforcing model. Over blocks of trials there were significant increases in the number of self-rewards. However, this increase was accounted for by the subjects in the Modeled Self-Reinforcement Condition.

The number of self-reinforcers emitted was found to be a function of ethnicity. Subjects of Chinese and Japanese ancestry self-rewarded significantly more than did subjects of European ancestry in the Modeled Self-Reinforcement

Condition, while members of these three ethnic groups did not differ from each other in the No Modeled Self-Reinforcement Condition. Overall, Chinese-American subjects self-reinforced more than did Japanese- or European-Americans.

There were no differences in number of reinforcers self-awarded among the feedback groups. However, those in the Low Positive Feedback Group self-reinforced on significantly fewer trials than did those who received no feedback.

Self-reinforcement did not vary as a function of sex of subject, nor of order of presentation of the modeling and feedback variables. Self-esteem levels of the subjects were not related to self-reinforcement rates, nor did the experimental manipulations affect prior self-esteem. Several significant correlation coefficients were obtained between demographic variables and dependent measures.

It was concluded that self-reinforcement appears to be a feasible and potentially useful technique for the amelioration of environmental factors which reduce well-being in the elderly. Moreover, modeling processes were demonstrated as an effective method for the transmission of patterns of self-reinforcement in older adults.

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CHAPTER I
INTRODUCTION

Declining birth and death rates and low immigration have led to a striking increase in the absolute and relative size of the aged population of this country. The percent of the U.S. population aged 65 and over has risen from 4.1% in 1900 to 9.9% in 1970 and continues to grow (Cutler & Harootyan, 1975). The elderly now represent a substantial minority of over 22 million persons. The fact that there will be increasing numbers of older persons has sensitized researchers to the issues of aging and has helped focus attention on the later years as an area for scientific investigation.

Bennett and Eckman (1973) have reviewed the literature on attitudes towards aging in the United States. They found that the public view of aging and old people, in general, is a negative one. Young and old alike hold these negative attitudes which the authors suggest may contribute to observed maladaptive behaviors among the aged. It is suggested, for example, that negative attitudes may result in an old person's unwillingness to seek services, health care and other types of assistance. Furthermore, these negative views of aging can widen the gulf between young and old, and dissuade the young from planning intelligently for their own old age. Perhaps the most damaging attitude is the one that categorizes

aging as an undesirable, but immutable series of decrements, which are biologically ordained, and therefore irreversible and barely subject to alleviation.

Researchers in the field of gerontology seemingly have shared this fatalistic attitude, for the literature has offered a picture characterized by decrement and deterioration in almost every capacity and function. The early research in gerontology has fostered a stereotype of aging as a general, inevitable, and irreversible decline in the quality of behavior. The aging stereotype, like most standard images, contains elements of truth, but it is often evaluative, inaccurate, and distorted. Because the "irreversible decrement" hypothesis was so widely held, investigators generally limited themselves to descriptive studies and were satisfied with "counting and classifying the wrinkles of aged behavior (Kastenbaum, 1968, p. 280)."

Recently, however, there have been suggestions that intervention techniques and experimental manipulations are appropriate for utilization in the study of the behavior of the elderly. Hoyer (1973) viewed the aging process as an interaction between a biologically maturing adult and a changing environment. He stated that current reinforcement contingencies may be an important determinant of the behavioral deficits associated with aging. Operant techniques have been little used in the study of behavior in old age, and Hoyer suggested that substantial changes could be

effected in the behavior of the elderly by changing the environmental consequences of that behavior. While respecting the role of past reinforcement history in establishing and eliminating behaviors, he emphasized the role of current reinforcement contingencies in maintaining and altering behavior in the elderly. Hoyer concluded by suggesting that "The design of more appropriate environmental and self-regulated consequences of behavior may prove to be an effective means of reducing behavioral deficits associated with the aging process (p. 21)."

Labouvie (1973) also decried the concept of aging as irreversible, biological decrement and called for a strategy of intervention to deal with behavioral problems in old age. She concurred with Hoyer (1973) and Hoyer, Mishara and Riebel (1975) that performance deficits may be environmentally, as well as biologically, based. Research designed to uncover antecedent-consequent variables which can be subjected to manipulation, Labouvie stated, will result in direct benefits to the elderly. Additionally, this type of research will help to correct the stereotype of old age as a state of inferiority by removing the deficiency from within the individual and placing it in his or her environment.

The notion that there are environmental deficits affecting the behavior of the elderly was supported by the findings of Lewinsohn and MacPhillamy (1974) whose investigation was stimulated by the similarities between the behavior of

depressed and of elderly persons (i.e., feelings of emptiness and hopelessness, loss of appetite, psychosomatic symptoms and complaints, and a reduction in the rate of emission of all behavior). This study was conducted within the framework of a behavioral theory of depression which holds that there is an inverse relationship between positive reinforcement and depression. In other words, psychological depression is conceptualized as an extinction phenomenon. It was found that, while depressed and elderly individuals engaged in fewer pleasant activities than non-depressed and younger persons, enjoyability ratings did not systematically decrease as a function of age. These results led the authors to conclude that the decrease in the pleasant activity level in the elderly is not a function of a decrease in potency of reinforcers, but is related to the availability of reinforcement in the environment. It was suggested that changes in the abilities of the individual with aging may make him/her less able to engage in activities which are potentially reinforcing (e.g., those requiring physical activity and endurance). In addition, attitudes on the part of society (e.g., early forced retirement) may deprive elderly persons of many behaviors which offer potential for reinforcement. Thus it is possible that the environment of many elderly is characterized by a relative lack in the availability of positive reinforcement as compared to the environment of younger persons, and therefore, many elderly are in a state

of relative deprivation as compared to the young. Support for this notion is provided by a study conducted by Bellucci and Hoyer (1975) which investigated self-reinforcing behavior in young and old women. It was found that the elderly subjects showed a greater increase in self-reinforcing behavior following noncontingent positive verbal feedback than did the younger subjects, suggesting, perhaps, a greater state of relative deprivation for the old as compared to the young.

Hoyer (1973) suggested that self-reinforcement techniques might be particularly relevant to the problems of the elderly in light of the suspected deficiency in external, environmentally based reinforcement systems for this age group.

In line with this suggestion by Hoyer, the present study was designed to explore the antecedent-consequent relationships between self-reinforcing responses and two major variables--modeling and environmental feedback, that have been demonstrated to affect subsequent self-reinforcement. Before intervention procedures employing self-regulatory methods with an older population are attempted, it should be demonstrated that older adults can easily acquire self-reinforcement techniques. Therefore, a major purpose of this study was to investigate the acquisition of patterns of self-reinforcement by means of the experimental manipulation of independent variables believed to have importance as antecedents of self-reward.

Self-Reinforcement

Self-reinforcement may be defined as the self-administration of a reinforcing stimulus contingent on a self-imposed criterion of performance (Weiner & Dubanoski, 1975). The supposition that humans can and do set standards for themselves and then reward or punish themselves contingently is widely credited to Skinner (1953). He stated, "The individual has it in his power to obtain reinforcement but does not do so until a particular response has been emitted (pp. 237-238)." Of course, self-control, or the self-management of behavior, has been studied for centuries, but only recently has this phenomenon been subjected to scientific analyses and controlled application (Thoresen & Mahoney, 1974). Learning theory proponents (Bandura, 1971a; Homme, 1965; Skinner, 1953; Watson & Tharp, 1972) have suggested that what had been labeled intrapsychic, purposive characteristics of the self are actually learned behaviors which respond to the same learning principles that govern externally directed behavior. It may be assumed that self-directed or "inner" behaviors are established originally by external contingencies, and these behaviors follow the same principles that govern the acquisition, maintenance, and extinction of those that are publicly accessible. There is experimental evidence that the course of self-reinforced responses parallels that, from establishment through extinction, of externally reinforced responses (Weiner, 1973).

Self-reinforcement may be considered as one of three components in the process of self-regulation, which consists of: (a) self-monitoring, (b) self-evaluation, and (c) self-reinforcement (Mahoney & Thoresen, 1974).

Kanfer (1970) and Bandura (1971a) have placed heavy emphasis on the role of self-reinforcement in self-control behaviors. These two investigators, and their associates, have been in the forefront of the exploration of self-reward processes in laboratory settings.

While sharing certain general conceptual aspects, these two researchers have varied the methodology and the focus of their investigations. Kanfer and his associates have generally used direct training techniques through the use of differential reinforcement in their investigations of self-reinforcement. Usually subjects were trained externally, through experimenter administered reinforcement, and then asked to administer their own rewards. Kanfer's research has generally involved ambiguous verbal or perceptual learning tasks where correctness of the response is difficult for the subject to ascertain. A variety of variables relating to the development and maintenance of self-reward patterns has been examined.

Bandura and his co-workers usually have used observational learning strategies in the study of self-reinforcement. Subjects have observed an adult or peer model who displayed

self-reward procedures and are then placed in a similar situation where they have the option for self-reward.

Each of the above mentioned paradigms have contributed useful data to the study of self-reinforcement, and each, including variations of the basic paradigms by other investigators, will be examined. Also to be examined is the central question of whether self-administered reinforcement has the same effects as externally controlled rewards.

Acquisition of Self-Reinforcement by Direct Training.

Using direct training procedures, Kanfer and Marston (1963a) found that the type of instruction given the subject resulted in different rates of self-reward. Lenient instructions produced frequent self-reward, while stringent instructions produced relatively infrequent self-reinforcement. As a consequence of these findings, Kanfer and Marston (1963b) varied social approval for self-reinforcement. They found that frequency of self-reinforcing responses varied as a function of experimenter attitude towards self-reward, as perceived by the subject. The performance of some subjects was generously rewarded with accompanying approval for self-reinforcement, while others were grudgingly rewarded and cautioned against reward without positive confirmation of accuracy. Those who received lenient training later self-reinforced at a significantly higher rate than those who were instructed to inhibit themselves.

Marston (1969) investigated the modifiability of rates of self-reward. He employed a pseudosubliminal perception task. After baseline measurement of self-reward rates, the subjects received positive feedback in the form of praise from the experimenter contingent on either (1) having self-reinforced on that trial, or (2) not having self-rewarded. He found that praise increased rates of self-reinforcing for those in the first group, and paradoxically, the positive feedback for not self-rewarding also produced increases in self-reward rates in the second group.

A number of investigators, working with children, have lent additional support to the notion that self-reinforcing responses can be established through direct training through the use of differential reinforcement. Bem (1967) trained 3-year-old children to press a lever as many times as the number of lights displayed in a particular trial. She then shifted control of behavior to the subject's own self-instructions by means of verbal cues. The children learned to control their own behavior by having their own verbal responses function as discriminative stimuli which in turn controlled their behavior.

Meichenbaum and Goodman (1971) developed a similar procedure to train "impulsive" children to control their own behavior. Through the use of guided participation and gradual shaping, the children were taught to give themselves self-instructions, first overtly then covertly, and to self-reinforce for performing tasks in a slow and deliberate

manner. This technique of self-instruction and self-reinforcement has been used successfully in modifying the behavior of schizophrenics (Michenbaum & Cameron, 1973), highly test anxious students (Meichenbaum, 1972), and multiphobic clients (Meichenbaum & Cameron, 1974). Meichenbaum (1974) has suggested that training old people to talk to themselves, using his self-instructional treatment approach, might result in the amelioration of certain behavioral deficits associated with aging.

The experimental evidence, therefore, suggested that self-control mechanisms could be established experimentally by means of learning procedures similar to those used for the establishment of external stimulus control. However, an important theoretical question remained for the earlier self-reward researchers: does self-administered reinforcement have the same effects in strengthening and maintaining behavior as does external reinforcement?

Self- Versus External Reinforcement in Behavioral Maintenance. Marston and Kanfer (1963) conducted one of the first studies comparing the effects of external reward with self-reward. Their male undergraduate subjects were exposed to one of three conditions: (1) experimenter administered reinforcement for correct responding, (2) no reinforcement, or (3) self-reinforcement. The results showed that external reinforcement and self-reinforcement were about equal and

that both were significantly better than the no reinforcement condition for performance maintenance.

Marston (1967) found evidence that external reinforcement was slightly less effective than was self-reinforcement and accuracy feedback in a study which compared the relative effectiveness of the three conditions on subjects' dart-throwing skills and line-length estimation.

In what may be considered a classic study, Bandura and Perloff (1967) compared the relative effects of self- and external reinforcement in the maintenance of effortful behavior. Elementary school children performed a manual wheel-turning task. Subjects in the self-reinforcement group selected their own performance standards and rewarded themselves on attainment of the self-imposed criterion. Children assigned to the externally imposed reinforcement condition were yoked to the self group, so that performance level was set for them. A control group performed without reward or were reinforced noncontingently. The results showed that the self-reinforced and the externally reinforced conditions were equally effective and produced many more responses than did the control condition.

Additional evidence for the behavioral maintenance properties of self-reinforcement comes from a number of applied studies done in the classroom. Lovitt and Curtiss (1969) studied the effects of self-imposed versus teacher imposed contingencies on the academic response rates of one

pupil. They found that higher rates occurred when the student arranged the contingencies than when the teacher imposed them. Glynn (1970) investigated the effects of experimenter-, self-, or chance-determined reinforcement on the academic performance of ninth-grade girls. She found that self-determined reinforcement was as effective as external reinforcement in improving test performance.

Felixbrod and O'Leary (1973) believed that neither the study by Lovitt and Curtiss (1969), nor that of Glynn (1970) permitted clear assessment of the relative efficacy of self-versus external reinforcement. Therefore, they also compared the effects of contingent reinforcement under conditions of self- and externally determined standards. The results showed that self-reinforcement was equivalent to external reinforcement in the maintenance of academic performance, and both were superior to the no reinforcement condition.

Self-reinforcement procedures applied to behavior modification in the classroom have been investigated by Johnson and his associates (Bolstad & Johnson, 1972; Johnson, 1970; Johnson & Martin, 1971). They compared self-reinforcement to external reinforcement in the modification of inattentive and disruptive behavior in the classroom. Typically, young students were first rewarded with points, exchangeable for prizes, for reducing their inappropriate behavior. The subjects were then randomly assigned to one of three groups. The self group were trained to manage their

own reinforcement contingencies. An extinction group had reinforcement discontinued, and an external group continued to be experimenter rewarded. The results of the three studies were basically similar. Both external and self-reward produced considerable reductions in inappropriate classroom behavior; however, the self-reinforcement procedures were slightly more effective than were external procedures.

In an attempt to isolate and examine a subprocess of self-reinforcement, and spurred by the suggestion from the above studies that self-regulation procedures may be more effective, under certain conditions, than externally determined reinforcement, Weiner and Dubanoski (1975) investigated the standard setting component of the self-reinforcement process. Children in grades two through four were randomly assigned to one of two conditions. One group (Self) was permitted to select one of three schedules of reinforcement. For the second group (External), the schedule was determined by a yoking procedure. The results revealed that subjects who were allowed to select their own standard for reinforcement exhibited greater resistance to extinction than did subjects whose standards were experimenter selected. Apparently choice and perceived control over the environment is reinforcing. Additional evidence that choice may possess reinforcing properties is provided by Brigham and Bushnell (cited in Thoresen & Mahoney, 1974) who found that children

preferred to work at a task in which they could choose the reward (i.e., type of candy) rather than at one in which the experimenter chose the reward. An animal experiment by Catania (cited in Thoresen & Mahoney, 1974) also supports the concept that choice is reinforcing. Pigeons preferred a condition in which either of two keys provided reinforcement over a condition in which only one key was available.

In summary, the foregoing studies have indicated that self-reinforcement is analogous to external reinforcement in the acquisition and maintenance of behavior. Moreover, there is evidence (e.g., Weiner & Dubanoski, 1975) that greater resistance to extinction may occur under conditions of self-reinforcement than under external reinforcement. This greater resistance to extinction under self-regulated reinforcement conditions may be due to the reinforcing effects of choice and perceived control, components of the self-reinforcement process.

The Independent Variables

Modeling

Modeling, which may be defined as the execution of a response or series of responses as a function of prior observation of the performance of that act by another, has been examined by investigators from various theoretical persuasions. Some of the terms applied to the phenomenon of copying or matching the behavior of models have been: identification,

imitation, incorporation, role-taking, observational learning, and modeling.

Historically, modeling was regarded as instinctual, and humans were thought to reproduce the behavior of others because of an innate propensity (Tarde, 1903). There was virtually no research on modeling process by early proponents of learning theory, due principally to Thronrdike's (1911/1965) disappointing results with animal imitation, until the classic work on imitation by Miller and Dollard (1941). They proposed that for imitative learning to occur, observers must be motivated to act, modeling cues must be provided, the matching responses must be performed, and the observers must be positively reinforced. The Miller and Dollard experiments demonstrated that when subjects are consistently rewarded for imitating the choice responses of a model they show an increase in imitative behavior, but stop imitating the model if they are never rewarded for making the same choices. These experiments have been widely accepted as demonstrations of imitative learning and how it is acquired, although Bandura (1971b) has claimed they represent, "only a special form of discrimination place-learning (p. 9)."

The proponents of operant conditioning who have investigated the modeling phenomena (e.g., Baer & Sherman, 1964; Gerwitz & Stingle, 1968) have specified discriminative stimuli, response, and reinforcement as the necessary components in the modeling paradigm. This interpretation drops

the motivational requirement, but otherwise retains the same conditions (i.e., cue, response, reinforcement) as proposed by Miller and Dollard (1941) in their matching-to-sample paradigm.

A salient issue for investigators of modeling behavior concerns the role of reinforcement in observational learning. As noted above, reinforcement theorists (Baer & Sherman, 1964; Miller & Dollard, 1941; Gerwitz & Stingle, 1968) have proposed that imitative responses must be reinforced in order to be learned. On the other hand, social learning theory (Bandura, 1971b, 1971c) makes the distinction between learning and performance of matching behavior. For Bandura (1971c) reinforcement facilitates learning through its effects on attentional, organizational, and rehearsal processes. Both operant conditioning and social learning theories assume that reinforcement strongly influences whether or not people perform what they have learned observationally. However, under social learning theory, behavior is regulated not only by directly experienced external reinforcement, but by vicarious and self-reinforcement.

Bandura (1971b) has outlined what he believes to be the four subprocesses that govern the modeling process. They are:

1. Attentional Processes. An observer will not acquire matching behavior if he/she does not attend to,

recognize and differentiate the distinctive features of the modeled responses.

2. Retention Processes. In order to produce the modeled behavior at a later time, the observer must retain the original input in some symbolic form. That symbolic representation plays an important role in observational learning is supported by the study of Bandura, Grusec, & Menlove (1966) in which children observed several complex sequences of modeled behavior. The subjects either merely watched, coded the novel responses into verbal form, or counted to prevent verbal coding. It was found that children who verbally coded the modeled behavior reproduced significantly more of the modeled behavior than those who merely watched, who in turn responded at a higher level than those who engaged in the competing response of counting.

3. Motoric Reproduction Processes. The third major component of modeling is concerned with physical capabilities, the availability of symbolic representations to guide the overt responses, and the self-observation of reproductions.

4. Reinforcement Processes. Although an observer may acquire and have the capability to reproduce the modeled behavior, overt performance may not occur because of lack of favorable incentive conditions. Bandura (1965) found that the introduction of positive reinforcement translated observational learning into overt imitative responding. The reinforcement may take the form of external, vicarious (i.e., response consequences to the model), or self-reinforcement.

Modeling and Self-Reinforcement. Bandura and his co-workers have extensively investigated the acquisition of self-reinforcing responses by means of a paradigm in which a model displayed self-reward procedures to an observer who later is placed in a similar situation where the opportunity for self-reward is presented. Bandura has usually used children as subjects, and unlike Kanfer, who used perceptual tasks and symbolic reward (e.g., a green light), the responses have been discrete and motoric (e.g., cranking a handle, bowling), and the rewards concrete (e.g., candy, pennies).

In one of the earliest studies of the effects of modeling on self-reinforcement, Bandura and Kupers (1964) found that children imitated both the amounts of material reinforcement and the self-evaluative verbalizations of adult models. The subjects observed a model who played a miniature bowling game that allowed the experimenter to control performance feedback. The model displayed either a high or a low standard of self-reward. Verbal praise or self-criticism accompanied the self-reinforcing behavior. Later the subjects played the game alone, and their self-rewards were recorded. It was found that the observers' patterns and magnitudes of reward matched those of the model to which they had been exposed. Control subjects who were not exposed to a model showed no consistent relationship between performance score and amount of reward taken. The adult models were slightly

more effective than the peer models in transmitting self-reward standards.

In a partial replication of the above study, Bandura and Whalen (1966) exposed children to a low-achieving model who self-reinforced for mediocre performance, a moderately competent model who self-rewarded for midrange scores, or a very competent model who received high scores and imposed stringent self-reward standards. The bowling game task was again employed and candy served as rewards. The findings again showed that children's standards of self-reinforcement were significantly affected by their exposure to differentially self-rewarding models. Those exposed to the low and moderately competent models readily adopted the self-reward patterns that they observed. However, the children rejected the stringent standards of the superior model and adopted self-reward standards within the range of their achievements. This finding was interpreted in terms of social comparison theory (Festinger, 1954), which states that an individual will be less likely to adopt modeled values if these are too divergent from his/her own.

To explore some of the conditions that might lead children to emulate severe standards of self-reinforcement, Bandura, Grusec and Menlove (1967) varied nurturance (friendly or detached), status of model (peer or adult), and social reward for stringent standards (praise or no recognition). The results showed that children who had

been exposed to the adult model and had observed his social reinforcement for stringent standards were much more likely to adopt high self-reward standards than those who had observed the adult model not praised or the peer model. The warmth and friendliness of the model tended to produce more lenient standards.

Further evidence for the importance of modeled factors in the acquisition of self-reward patterns was furnished by Mischel and Liebert (1966). They also employed the bowling task in an investigation of the discrepancies between observed and imposed standards, a condition to which most children are exposed in the natural environment. The subjects were divided into three groups. For the first, a model rewarded himself for high performance but guided the subjects to reward themselves for lower achievement. In the second, the model adopted lenient criteria but imposed stringent ones on the subject. For the third group, observed and trained standards were both high. The results showed that when modeled and taught criteria were of different stringency, the subjects adopted the more lenient alternative. The stringent-stringent condition resulted in fewest deviations from the criterion.

In an extension of the above study, McMains and Liebert (1968) exposed their subjects to two successive models, the second of whom displayed standards either consistent or inconsistent with the standard set by the first model. It

was found that consistency did result in fewest deviations, and when there was a disparity between the two models, the subjects followed the standards of the one to which they had been most recently exposed. Hildebrandt, Feldman and Ditrachs (1973) replicated and confirmed the findings of the above two studies. Their results suggested that consistency of a standard and a recent model seems to be the most effective method in the adoption of a criterion for self-reinforcement.

In an attempt to compare the effects of direct training versus modeling in the acquisition of self-reinforced responses, Liebert and Allen (1967), using the same bowling game as in the previously mentioned studies, gave half their subjects direct training and had half observe self-reward patterns of a model, also varying rule structure (stringent or lenient) and amount of reward. They found that subjects exposed to the stringent rule structure deviated less than those exposed to the lenient rules. There was no significant difference between the direct training and the modeling groups. These findings were replicated by Liebert and Ora (1968).

Several generalizations regarding the establishment and maintenance of self-reinforcing responses may be made:

1. Self-reinforcement is at least equivalent to external reinforcement in the regulation of behavior.
2. Self-reinforcing behaviors may be acquired through direct training using differential reinforcement, or may be established through exposure to models, or both.

3. Self-imposed standards of reinforcement are influenced by leniency instructions, modeled standards, consistency thereof, and social reinforcement.

It should be noted that the data on the self-reinforcement processes come from studies in which children or college-aged persons were employed as subjects. Prior to this study, there has been no direct evidence that elderly persons would respond as did younger subjects when exposed to similar variables. There is, however, one bit of indirect evidence that older persons can and do imitate models to whom they are exposed. Hoyer, Kafer, Simpson and Hoyer (1974) conducted a study in which they attempted to reinstate verbal behavior in nonverbal geriatric mental patients using operant procedures. The reinforcement techniques succeeded in increasing the verbal behavior of their experimental subjects. It was also noted that during the training sessions, subjects not directly reinforced by the experimenter for verbalizing increased their verbalizations. The authors attributed this increase in verbal behavior of the control group, who were present during the intervention sessions, to the fact that the control subjects were imitating the reinforced subjects. Moreover, the studies dealing with modeling and self-reinforcement, in the main, have been concerned with the acquisition of modeled standards of reinforcement or maximum performance criteria for self-rewarding behavior, and only incidentally with the strengthening of an existing self-reinforcing

self-reinforcing response. Typically, the use of stringent and lenient conditions implied the value judgment that inhibition of self-reward is the desired behavior. The present study, however, was interested in the manipulation of variables which would serve to disinhibit self-reward in order to provide an additional source of reinforcement for an older population.

Feedback

Learning is governed, to a large extent, by the rewarding or punishing consequences of any action. Bandura (1974) has suggested that reinforcement serves informational and incentive functions in addition to response strengthening capabilities. He stated that during the course of learning, people make responses and then observe the differential consequences of their actions. On the basis of feedback, they develop hypotheses and expectations about the kinds of behavior most likely to succeed. The informational properties of reinforcement also enable the individual to formulate standards of behavior and evaluate the discrepancy between standard and performance.

Feedback, in the form of success/failure manipulations, has been studied extensively in relation to its effects on subsequent performance. Kennedy and Willcutt (1964) reviewed 50 years of research on the effects of praise and reproof on the performance of school children. They found that although success feedback (i.e., praise) generally acts as a

facilitator of performance, in certain studies (Forlano & Axelrod, 1937; Sandstrom & Weinz, 1958) blame was more effective than praise, and in others (Chase, 1932; Hurlock, 1924) praise and reproof were about equal and both more effective than control conditions. Of course, the latter findings may have been due to the Hawthorne effect (Roethlisberger & Dickson, 1939), in that the subjects may have been responding more to experimental change than to the specific content of that change.

Three studies by Feather (Feather, 1966; Feather & Saville, 1967; Feather, 1968) have indicated that prior success or failure at a task influences subsequent performance at the same task. Subjects who succeeded initially at an anagrams test subsequently performed much better than subjects who failed the first few items. The effects of this prior experience were greater as the amounts of initial success or failure were increased. It was found also that changes in confidence ratings were positively correlated with performance scores.

Miller, Brickman and Bolen (1975) compared success feedback to persuasion in a two-part study. In Experiment I they attempted to modify children's littering behavior and found that praise and success feedback were significantly more effective than persuasion and control conditions in changing the behavior of the subjects. Experiment II was designed to improve the math scores of second graders. Again it was

found that the success feedback condition was significantly more effective than the other treatments.

Feedback has been seen as important in the development of certain personality traits, such as self-esteem, intrinsic-extrinsic motivation, and locus of control. For example, Wylie (1961) stated that self-evaluation is learned through a combination of rewards and punishments for one's actions, and, therefore, self-esteem is the sum of learning about one's self while manipulating the environment. She reviewed a series of experiments in which subjects were made to succeed and/or fail on experimentally induced tasks. Wylie concluded that people will, under certain conditions, change their self-evaluations after the manipulation of success and failure, however, these changes are most likely to involve self-ratings on the experimental task, and are least likely to involve changes in global self-regard. There was more evidence that changes in self-rating upward following success would occur than changes downward after failure.

Deci and his associates (Deci, 1971; Deci & Cascio, 1972; Deci, Cascio & Krusell, 1973) have investigated the effects of positive and negative feedback on intrinsic and extrinsic motivation. Persons who seek their principal satisfaction from the inherent nature of the task (i.e., challenge, creativity) are referred to as intrinsically motivated. Those who concentrate on the rewards provided by the environment (e.g., money, job security) are labeled extrinsically

motivated. It was hypothesized by Deci that feedback that strengthened feelings of competence and self-determination would enhance intrinsic motivation while feedback that weakened these feelings would decrease intrinsic motivation. It was found that negative feedback decreased intrinsic motivation for all subjects, and positive feedback increased intrinsic motivation for males. However, females showed slightly less intrinsic motivation after positive verbal reinforcement than before.

Locus of control investigators have studied the effects of feedback on internal and external subjects. Locus of control is a general orientation and expectation about reinforcement and its source (Rotter, 1966). One is classified on the internal-external continuum according to the extent that one perceives reinforcement to be a consequence of one's own behavior. Baron and Ganz (1972) found that the performance of externals was superior to that of internals under conditions of external feedback. Heilbrun (1970) found externals to be highly responsive to external social reinforcement, both vicarious and direct. Bellack and his associate (Bellack, 1972; Bellack & Tillman, 1974; Bellack, 1975) have consistently reported that externals are highly dependent on external input, and they manifest performance deficits in the absence of such input. Therefore, externals seem to be much more susceptible than internals to the effects of success/failure feedback.

The studies of the effects of prior success and failure on subsequent performance at a task are complex and seem to depend on the characteristics of the person and of the particular situation.

Feedback and Self-Reinforcement. One of the first studies of the effects of prior success/failure manipulations on self-reinforcement was that of Bandura and Whalen (1966). This study investigated self-reward as a function of prior modeled behavior and also the effects of pretask success and failure. Before observing a model, the subjects were exposed to either positive or negative feedback concerning their accomplishments on several disparate tasks. The effects of the success/failure manipulations were not clear. Subjects who had undergone failure tended to reward themselves less than subjects who had experienced success, if they had observed a model. The no-model control subjects who had been exposed to failure self-rewarded at higher rates than those who had experienced success. The authors attempted to explain this latter finding, which was contrary to prediction, by suggesting that, "under certain circumstances self-gratification may primarily serve a therapeutic rather than a self-congratulatory function (p. 381)." In other words, persons can engage in self-reinforcement as a treat for a job well done, or may dispense self-reward following failure to cheer themselves up or provide distraction in order to reduce aversive stimuli associated with failure.

Mischel, Coates and Raskoff (1968) were concerned with the affective component of the success-failure manipulation. It had been demonstrated (Isen, 1966; Kanfer & Marston, 1963a) that if a person receives feedback indicating he is doing well at a task, he contingently rewards his performance on it more generously than when he thinks he is doing poorly at the task. However, the influence of success and failure experience on later noncontingent self-reward in a context entirely different from the initial success/failure task had not been tested. In two experiments, children were provided with success or failure experiences on a bowling game. Following the manipulation the subjects were given the opportunity to reward themselves noncontingently with tokens on a different task. Children who were successful at the bowling game rewarded themselves quite generously later. Those who had failed initially did not self-reward heavily, providing no support for the "self-therapy" hypothesis. The results were interpreted to mean that those children who were feeling good about themselves and had "the warm glow of success" celebrated by taking more of the freely available reinforcers than did the failure and control subjects.

Isen and her co-workers (Isen, 1970; Isen & Levin, 1972; Isen, Horn & Rosenhan, 1973) investigated the effects of success and failure on children's generosity to themselves (self-reward) and to others (altruism). It was found that success leads to generosity towards self and others. These

prosocial behaviors were attributed to the positive affect generated by the success manipulations. Isen et al. concluded, "The experience of success understandably makes one feel one has earned contingent rewards and encourages greater self-reinforcement than does failure or 'non-affect' control conditions (p. 246)."

Masters (1972) hypothesized that "therapeutic" self-reinforcement might increase under conditions in which the failure experience was sufficiently dissimilar from the self-reward opportunity, whereas self-therapy would decrease when the self-reward task was similar to the one on which failure was experienced. Children experienced success, failure or no feedback on a highly distinctive task and then were allowed to reward themselves on a second task which was either identical or quite different from the earlier task. In line with the previously reported results, children increased their levels of self-reinforcement following success, especially when such reward was contingent on a task similar to the one at which they had been successful. Following failure children showed increased self-reward only when such reward was noncontingent on their performance or occurred during performance at a task which was distinctively different from the one on which they had experienced failure. This study demonstrated that self-reinforcement could take the form of self-congratulations or self-therapy, depending on the proper conditions.

Underwood, Moore and Rosenhan (1973) further investigated the congratulatory and therapeutic effects of self-reward by manipulating positive and negative affect. Third graders were instructed to think "happy" thoughts, "sad" thoughts, or to count numbers. Following this presumed affect induction procedure, each subject was allowed to take, privately, as many pennies as he/she wished from a large chest. Children in both the positive and negative affect conditions took more pennies than the control children, although the effect was marginal for the negative affect group. These findings were replicated and extended by Rosenhan, Underwood and Moore (1974).

Taken together, the above reported studies seem to indicate that the experience of success makes the self a more rewarding and to-be-rewarded object, which serves to facilitate self-reinforcement. However, as with the previously cited studies of modeling and self-reinforcement, a cautionary note should be interjected. All of the studies cited above on the effects of feedback as an antecedent of performance in general and self-reinforcement, in particular, have employed children and college-age persons as subjects. The data on the effects of feedback on the subsequent performance of older persons are sparse. Lair and Moon (1972) employed old and middle-aged men in a study of the effects of praise and reproof on subsequent performance at digit-symbol substitution tasks. The findings were mixed and

difficult to interpret. In some conditions praise seemed more effective than reproof or neutral control, while for other cells, there were no differences between the three reinforcement conditions. The authors suggested that the data were supportive of, "the commonly held notion that at least some portion of the elderly population is not responsive to the usual social amenities as presented by other persons (p. 238)."

Hutchinson (1974) used young and old females in a cross-sectional study of the effects of praise and reproof on subsequent paired associate learning. The praise and reproof conditions did show significant age differences. For the younger subjects, the no feedback control group made significantly fewer errors than did either the praised or reproofed groups. No significant differences were found among the elderly subjects in relation to praise reproof or control. This finding of no differences for the elderly group led the author to suggest the results were due to, "some type of deficit in the elderly in terms of motivational state or arousal propensity (p. 185)." However, the finding that the younger group performed in a manner which was contrary to expectation did not elicit suggestions of a deficit on their part from the investigator.

Hoyer and Cone (1974) conducted a socialization experiment which included assessments of elderly female foster-grandparents' caretaking behaviors with retarded children. A

manipulation designed to test the effects of false feedback concerning child performance showed no significant differences between the feedback conditions.

Caution must be taken in interpreting the findings from the three studies cited above in which the behavior of elderly subjects apparently was not affected by the feedback manipulations. The lack of effects may have been due to experimental artifact, the special characteristics of the samples used, the insensitivity of the measuring instruments, or any combination thereof. Care should always be taken in the ascription and interpretation of results which support the null hypothesis.

In perhaps the only study extant of self-reinforcement and feedback which employed elderly subjects, Bellucci and Hoyer (1975) found that noncontingent positive feedback, in the form of praise on a prior task, produced increases in self-reinforcing behavior. Greater increases were demonstrated for elderly than for young subjects. The elderly were more susceptible to the feedback than the young, and the general effect of the treatment was to raise the level of self-reinforcement and self-evaluation of the elderly subjects to approximately that of the younger in the positive feedback conditions. The authors concluded by suggesting that some of the age-associated declines in behavior might be attributed to a lack of positive feedback in the typical environment of older adults.

Sex Differences

The studies relating to self-reinforcement have not revealed important differences between males and females regarding their self-reinforcing behavior. The possible reason for the lack of differential results for the sexes may be the type of experimental design used. Many of the studies cited herein have either: (a) employed subjects who were all of one sex, or (b) not controlled for sex as an independent variable. Other investigations have found no differences in responding between males and females (e.g., Liebert & Allen, 1967). However, Bandura and Whalen (1966) found that boys and girls differed significantly in frequency of verbal self-reinforcement, but not in self-administration of material rewards. This finding of more positive verbal self-evaluation by boys held in only two of the three experimental conditions. The authors had no ready explanation for the results.

In a similar finding, Deci et al. (1973) discovered a sex difference in responding to positive verbal feedback, which increased intrinsic motivation of males, but decreased the intrinsic motivation of females. The sex of the experimenter did not make a difference in the results. Again, the authors had no convincing explanation, but attributed this finding to the speculation that, "Females evaluate feedback in a way that is different from the way males evaluate it (p. 8)." It would appear that for the females in

the two above studies, positive verbal feedback actually acted as an aversive stimulus and decreased responding.

Bandura and Perloff (1967) found that boys emitted more self-reinforcing responses than did girls. However, the dependent measure involved a cranking response in which the subjects made the effortful response of turning a crank handle in order to get points. The higher number of responses emitted by the males may have been a function of greater physical strength on their part as compared to the females.

It was decided to use sex of subject as an independent variable in this study in order to partial out a possible source of variation, and, additionally, because the data on sex differences in behavior in later life are very sparse.

Order of Presentation of Modeling and Feedback

Bandura and Whalen (1966) manipulated positive and negative feedback before exposing children to models. They found that the modeling effects superceded the success/failure results, in that modeling was more effective for the adoption of standards of self-reinforcement than was prior feedback. However, as in the previously cited studies of McMains and Liebert (1968) and Hildebrandt et al. (1973), the results may have been artifactually determined by a recency effect (i.e., experience that has just occurred is more likely to determine the outcome of an immediate situation than a less recent experience, Epstein & Rock, 1960).

Therefore, in the present study, the order of presentation of the feedback and modeling phases was counterbalanced (i.e., half of the subjects were exposed to the feedback condition first and then to the modeling condition, and for the other half, the order was reversed).

Self-Esteem

Although self-esteem was not used as a manipulated independent variable, it was employed as a correlational variable in this study because of its assumed important relationship to the areas of self-reinforcement and of aging.

Rosenberg (1965) defined self-esteem as an attitude towards an object which happens to be the self. Unlike other attitudes, this attitude towards the self is central to the individual, coloring thoughts, feelings and behavior. Branden (1969) stated that self-esteem has two interrelated aspects: a sense of personal efficacy and a sense of personal worth. Wylie (1961) suggested that self-esteem is learned through a combination of rewards and punishments for one's actions, and therefore, it is the sum of learning about one's self while manipulating the environment. Diggory (1966) believed that self-esteem results from the value we attach to ourselves as a result of success and failure in accomplishments. He stated, "It is success in behavioral terms that leads to higher self-evaluation and self-esteem (p. 94)."

Self-Esteem and Self-Reinforcement. Bandura (1971a) defined self-concept as the result of discrepancies between an individual's behavior and the standards that one has set as indicators of one's personal worth. When behavior falls short of one's personal evaluation standard, then one judges him/herself negatively. When performance coincides with or exceeds a self-set standard, a person evaluates him/herself favorably and increases their self-esteem. Within a social learning approach, a negative self-concept is defined in terms of self-punishment and a favorable self-concept is reflected in a disposition to engage in self-reinforcement.

This suggestion by Bandura that self-reinforcement can be a reflection of one's self-esteem was experimentally examined by Rechly and Mittman (1973). Junior high school students were divided into high, middle, and low self-esteem groups on the basis of Rosenberg's (1965) self-esteem measure, and performed tasks of varying ambiguity. The dependent measure was the number of points self-awarded on each task. A strong positive relationship was found between levels of self-esteem and amount of self-reinforcement. On the other hand, a study by Oziel and Berwick (1974) which investigated the effects of self-concept and feedback on subsequent self-reinforcement found that self-esteem was not related to rates of self-reinforcement, but that facilitating feedback (i.e., success) raised self-reinforcement and inhibiting feedback (i.e., failure) decreased self-reward. There were no

differences in self-reinforcement rates between high and low self-esteem subjects either in regard to baseline rates or change scores after the experimental manipulations.

In one of the few studies of self-punishment, Herbert, Gelfand and Hartmann (1969) measured self-esteem and its relationship to self-punitive behavior. The subjects were children, and the bowling game apparatus, employed in many studies of modeling, was used. Half the children saw an adult model who criticized his performance and fined himself for low scores. Half saw no model. The subjects were also divided into high and low esteem groups, and on the basis of sex. The results showed that those subjects who had observed the self-critical model were much more self-punitive than those who had not seen the model. There was no change in subjects' self-esteem ratings from pre- to post-testing for either the experimental or the control group. Moreover, there was no correlation between self-esteem ratings and negative self-reinforcement.

Self-Esteem and Aging. Self-esteem has been viewed as the essential ingredient in successful aging (Schwartz, 1975). Because the development of self-esteem has been assumed to be dependent on a sense of personal efficacy and impact on the environment (Branden, 1969; Diggory, 1966; Schwartz, 1974; Wylie, 1961), and because older persons are thought to be less effective and therefore to value themselves less than

do younger persons (Bennett & Eckman, 1973; Kogan, 1961), it has been widely hypothesized that self-esteem declines with age (Kogan & Wallach, 1961; Lehner & Gunderson, 1953; Mason, 1954). The evidence on this issue has been less than definitive. There have been studies which have reported decreasing self-regard with increasing age. Mason (1954) found younger subjects to have higher self-esteem than older persons, and the lowest mean scores were from a group of aged, institutionalized, low economic status subjects. Kogan and Wallach (1961) investigated age changes in values and attitudes and found their overall results supportive of the prediction of decline in self-concept with age. Lehner and Gunderson (1953) found a curvilinear relation between age and self-esteem, with increases in self-valuation to age 30 for men, followed by a period of stability and then decline. For women, the curve was similar but occurred later in life. This notion of a curvilinear relationship supported Buhler's (1935) concept that the psychological curve of development parallels the biological curve in a sequence of expansion, stability, and contraction.

Other investigators who have found evidence of decline in self-esteem with increasing age were Cameron (1967), Dodge (1961), and Ziller and Grossman (1967).

Conversely, there have been a number of studies which have found that older age groups tend to be more positive in self-regard than younger groups. Trimakas and Nicolay (1974)

measured self-esteem in 162 elderly women using the Tennessee Self-Concept Scale (Fitts, 1965). They found their sample had a significantly higher mean score than did a younger normative sample. Both Clements (1972) and Postema (1970) found significantly higher means for elderly than for younger persons using the same instrument. Kitching (1972) investigated the self-concept of middle-aged women and found that subjects in late middle-age had higher self-concept scores than women in the early middle years. Tuckman, Lorge and Zeaman (1961) hypothesized that human figure drawings would show increasing loss of intactness when drawn by older subjects, indicating psychological and physiological differences in an older population. Their hypothesis was not supported. Bloom (1961) also found no evidence of increases in self-rejection with age.

The general lack of agreement between studies in this area has led investigators to examine the possibility that the relation between age and self-esteem is a conditional one. Schwartz and Kleemier (1965) hypothesized that illness and aging have an effect on self-esteem. They found that differences in self-concept were a function of illness but not of age. However, illness had a greater downward effect on the self-esteem of the elderly patients than of the younger patients.

Kaplan and Pokorny (1970) aware of the contradictory findings on the relationship between aging and self-esteem,

attempted to specify conditions under which aging is inversely related to self-attitude. They factor-analyzed responses of 500 subjects to Rosenberg's (1965) self-esteem scale and a questionnaire regarding recent life events. They found no relation between aging and self-esteem, overall. However, they found an inverse relationship between self-esteem and the number of recent life experiences which required behavioral adaptation (i.e., moving, death of a spouse). In addition, there were three circumstances relating to standards of living, household composition, and childhood fears, which showed an association between self-esteem and age. The authors suggested that their findings were not inconsistent with Disengagement Theory (Cumming & Henry, 1961) which postulated that voluntary withdrawal from life activities is a desirable and satisfying process for older persons.

Lowered self-esteem in old age may be the result of inability or unwillingness to modify standards for self-judgment. Bandura (1971a) suggested that dysfunctions in self-reinforcement systems can lead to psychopathology by creating excessive self-punishment through overly high standards for self-reinforcement. A harsh set of standards for self-reward may give rise to feelings of worthlessness, discouragement, and lack of purposefulness. Clark and Anderson (1967) believed that reassessment of the criteria for self-evaluation among the elderly was most important if feelings of uselessness and concomitant self-punishment were to be

avoided. If, for example, older persons adhere to prior standards of achievement, many of their performances will be self-punished, leading to lower self-esteem, with possible apathy and a low rate of behavior emission. It is suggested that behavioral improvements are possible in the absence of external reward if persons can supply rewards to themselves. It is further suggested that self-reinforcement holds promise for increasing the capacity of the elderly to regulate their own feelings, thoughts, and actions.

Purpose of This Study

The major purpose of this study was to investigate the effects of feedback and modeling on self-reinforcing behavior for a sample of older adults. Very little is known regarding patterns of self-reinforcement in older persons. Moreover, feedback and modeling have not been systematically varied using elderly subjects. Almost all of the data on the effects of these two variables has been obtained using children and young adults as subjects. Whether the social learning model is generalizable to all age groups has been questioned by Duke, Shaheen and Nowicki (1974) who stated, "It is intriguing to consider, however, that social learning theory, much of the support for which is obtained from studies with children and college age adults, may be differentially applicable to older populations (p. 284)." They go on to suggest that many of the basic findings in the literature

should be reevaluated with geriatric populations to determine if results, once thought widely generalizable, are, in fact, age related.

More importantly, perhaps, self-reinforcement is viewed as a possible prosthetic technique for those elderly whose environments are deficient in external sources of reinforcement as compared to younger persons. If, as has been suggested (e.g., Lewinsohn & MacPhillamy, 1974), the availability of reinforcers from external sources is diminished for many elderly persons, then it might be well to teach older persons to self-reinforce in order to compensate for deficits and losses in the quantity and quality of behavior. Self-reinforcement is a behavior that can be learned just as other behaviors are learned (Watson & Tharp, 1972).

Additionally, it has been suggested (Lawton & Simon, 1968) that as the competence of the aging individual decreases, the proportion of behavior influenced by environmental, as contrasted to personal, conditions increases. This places the older person with declining abilities in the position of relying more on external supports, in comparison to a younger person. The development of self-directed behavior could lessen this dependency on external criteria, especially at a time when positive external support may be lacking.

A related purpose of this study was to investigate the relationship between self-esteem and self-reinforcement. Although a positive relationship has been reported between

these two variables (Rechly & Mittman, 1973), other evidence suggests that self-reinforcement rates are not associated with self-esteem (Herbert et al., 1969; Oziel & Berwick, 1974). Since it has been argued that positive self-esteem is a central factor in successful aging (Schwartz, 1974, 1975), it is important to investigate whether the enhancement of a self-reinforcing behavior system would increase positive self-evaluation at a time in life when self-appraisal is thought to become increasingly more dependent on external criteria.

The investigation of self-reinforcement processes is a necessary prerequisite to the application of intervention methods using self-regulatory techniques. Goldfried and Merbaum (1973) have suggested that self-reinforcement, as an integral feature of self-control, is currently assuming a central focus in theories of behavior. They stated that this shift in focus to covert processes demands, "A concerted effort to integrate, objectify, and specify the antecedents of self-regulatory processes in scientifically meaningful terms (p. 32)." The purposes of this study are directly in line with the above suggestion.

It is suggested that modeling and feedback are two powerful facilitators of self-reinforcement. The work of Bandura and his associates and others (e.g., Bandura & Whalen, 1966) have shown that patterns of self-reinforcement can be transmitted by means of modeled behavior.

Feedback, in the form of success/failure manipulations, has been shown to affect subsequent performance (e.g., Feather, 1968). The affective component of success/failure feedback has been effective in influencing self-reinforcement (e.g., Mischel et al., 1968). Direct application of positive verbal feedback has been shown to increase self-reinforcement in elderly subjects (Belluci & Hoyer, 1975).

The systematic manipulation of feedback and modeling with self-reinforcing responses as the dependent measure has been attempted only once, using children as subjects (Bandura & Whalen, 1966). No effort was made to counterbalance the order of presentation of the independent variables, and the obtained results may have been influenced by artifactual recency effects.

Therefore, the main purpose of this study was to investigate the effects of systematically varied levels of feedback and modeled performance on the subsequent self-reinforcing behavior of elderly subjects.

Four independent variables were used. They were: (a) modeling (exposure to a model who self-reinforced or did not); (b) feedback (high positive, low positive or no feedback); (c) order of presentation of the modeling and feedback variables (feedback first, then modeling or the reverse); (d) sex of subject. In addition, measures of self-esteem were taken before and after the experimental manipulations. The dependent measures were: (a) number of

self-reinforcing responses emitted over blocks of trials, and (b) number of trials in which self-reinforcement occurred.

There were a number of predictions. One, subjects who were exposed to a model who self-reinforced would emit more self-reinforcing responses than those who viewed a non self-rewarding model. Two, subjects in the High Positive Feedback Condition would self-reinforce more than subjects in the other two feedback groups. Three, the greatest amount of self-reinforcement would occur for the subjects exposed to the combination of High Positive Feedback and Modeled Self-Reinforcement Conditions.

CHAPTER II

METHOD

Pretesting

Prior to actual data collection, a total of 22 persons served as pilot subjects in order to refine the procedure and test the apparatus. Twenty pilot subjects were undergraduate students at the University of Hawaii, Manoa, and two were members of a Honolulu senior citizens club.

Subjects

Initially, 183 men and women, age 65 and over, served as subjects. Of this total, three persons were eliminated for failure to follow directions. The remaining 180 subjects were divided almost equally by sex--96 females and 84 males. The mean age of the sample was 71.5 years, with a range of 65 to 86 years. All subjects were volunteers, recruited through various senior citizens clubs and at housing for the elderly. Each was paid \$2 for participation. The subjects were of multi-ethnic origins, and were distributed by ethnicity in approximately the same proportions as the resident population of the State of Hawaii (Population Breakdown, 1975), with the exception that persons of Chinese ancestry were overrepresented (24.4%) as compared to the population (4.9%). A breakdown by marital status showed that 58.3% of

the subjects were married at the time of testing, 2.8% had never married, with the balance (38.9%) being either divorced, separated or widowed. The socioeconomic backgrounds of the subjects were diverse, and almost equally distributed among seven categories of major life occupation, ranging from laborer through professional. The median number of school years finished by the subjects was 10.4, which was significantly less than the median 12.3 years completed by the adult population of the State of Hawaii, $t(179) = 6.58$, $p < .01$ (Census Portrait of Hawaii, 1974). All subjects were in apparent good health at the time of testing.

Apparatus

Feedback. The apparatus and materials used during the feedback phase were: (a) a series of 22 slides of matrices composed of light and dark cells, (b) a Kodak automatic slide projector, model 850-H, (c) a portable screen, 1.02 X 1.02 m, (d) a small box, 13 X 7.5 X 5 cm, with two buttons mounted on top, and (e) a metal box, 15.2 cm square, in which was installed a NuTone two-note door chime, and which had a 25 watt, amber electric light bulb mounted on top.

Two of the slides served as training stimuli and were designed so that the proportion of light to dark cells was easily discriminable. For the remaining slides, the proportion of light to dark areas was .50 in all cases, but this was not readily apparent, even with relatively long exposure to each stimulus pattern (see Figure 1). The patterns were

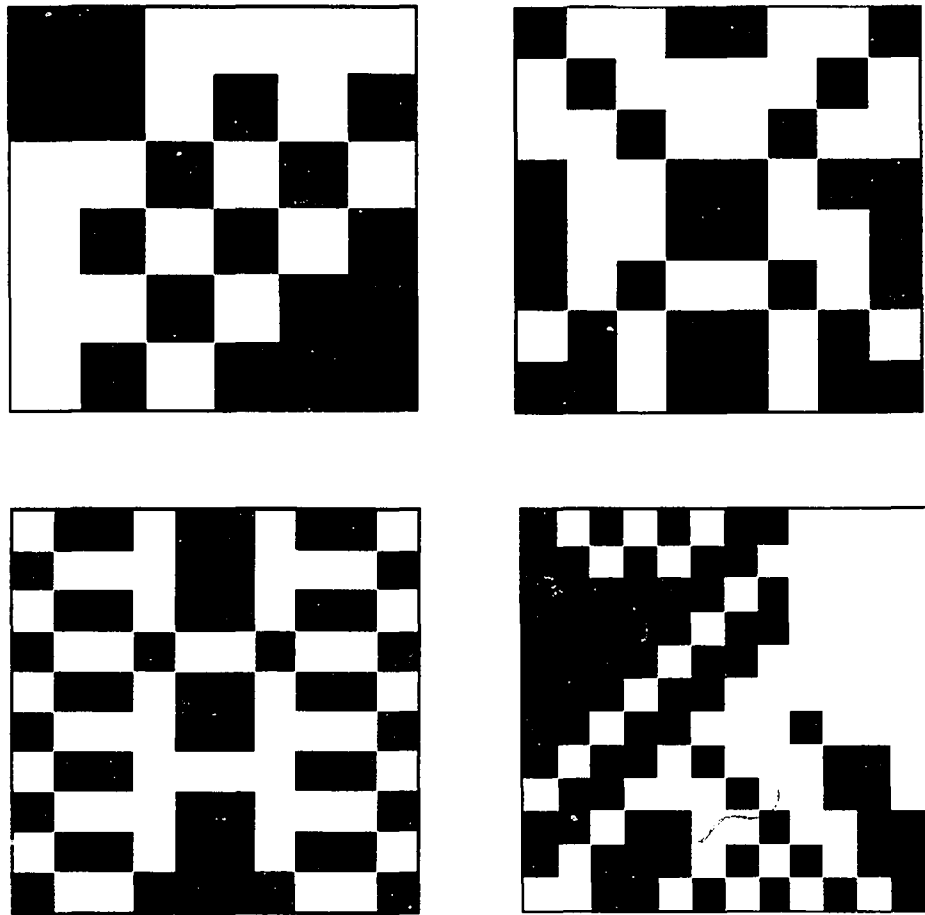


Figure 1. Samples of patterns used as ambiguous stimuli in feedback phase. Each design is an example of a different matrix grain.

constructed using clear acetate sheets, 21.5 X 25.5 cm on which there was an overlay of translucent orange acetate, 13 X 13 cm. (trade name, Amberlith, Ulano Graphic Art Supply Co., Brooklyn, N.Y.). The matrix was formed by cutting away the orange material to produce the desired pattern. Four $N \times N$ matrix grains were used, with N equal to 6, 8, 10 or 12. Five patterns were constructed in each matrix grain, and with the two training patterns, were made into standard 2 X 2 inch (5 X 5 cm) slides.

The subjects made responses, during this phase, by pressing one of two buttons, labeled white and orange respectively, which were mounted on the small box. These responses were monitored, remotely by the experimenter, who could provide feedback, under the appropriate conditions, consisting of auditory and visual stimuli. When the experimenter pressed a button on his control panel, a pulse was sent to the feedback device, causing simultaneous activation of the chime and light.

Videotapes. For use during the modeling phase, two videotapes were made, using Sony 1/2 inch (1.27 cm) videotape. The opening segment of each tape was identical, but each had a different ending, depending on the experimental condition. The first part consisted of the experimenter talking to an interviewer about the topic of aging, and, ostensibly, about a past gerontological research project in which the experimenter was the principal investigator. The

format of this simulated interview resembled that of a television talk show for the purpose of stimulating viewer interest so that subjects would be relatively certain to attend to the tape. The second segment of the tape was different for each of the two modeled conditions (see Appendix A for the complete videotape scripts). Those in the Modeled Self-Reinforcement Condition observed the model, a 75-year-old Caucasian-American female, ostensibly in a film clip taken during an actual experiment. The model was seen to be engaged in a matching-to-sample discrimination task (Raven's Matrices), and vigorously self-reinforcing (using the point dispenser apparatus to be described later) for self-perceived correct judgments. The model judged her performance correct on six of seven modeled trials and self-dispensed a total of 24 points. The subjects in the No Modeled Self-Reinforcement Condition observed the same model engaged in the same task, for the same number of trials, but the point dispenser was not present and the model did not self-reinforce.

A Sony Videotape Recorder, model AV 3400, and a Sony TV Monitor, model CVM-110UA, were used to present the videotapes to the subjects. The total viewing time for each of the tapes was 5.5 minutes.

Matching-to-Sample. The matching-to-sample apparatus was used during the final phase in which the dependent measures of self-reinforcement were taken. Other equipment

used in this phase included: (a) a series of 22 slides of various size circles, (b) two slide projectors, a Kodak 850-H, and a Sawyer model 500R, (c) a portable screen, and (d) a box, 30 X 24.5 X 24.5 cm, on which was mounted a metal lever, a small green light and a response counter. The matching-to-sample apparatus was based on a type of device used in the studies of perceptual accentuation (Bruner & Goodman, 1947; Carter & Schooler, 1949), by means of which a subject could cause a projected circle of light to vary in size. The apparatus consisted of a light source provided by the Sawyer projector, an iris diaphragm which could be varied in diameter by turning a knob, a lens to focus the light and a mirror to bend the beam of light 90° (see Figure 2 for sketch of apparatus). There was a cover over the apparatus, so the subject could see only a large box, 61.5 X 57.5 X 15 cm, with a knob facing him/her at the front and a beam of light emerging from the rear onto the screen.

A series of 20 slides were made by photographing 10 circles ranging in diameter from 2 to 20 cm at regular increments of 2 cm, each twice, plus two training slides, 3 and 19 cm respectively. These 22 slides served as sample stimuli to be matched by the subject. They were projected, in randomly arranged order, on to the screen, 30 cm to the right of the image controlled by the subject.

The subject could self-reinforce, for self-perceived correct matching of the sample stimuli, by pressing the lever

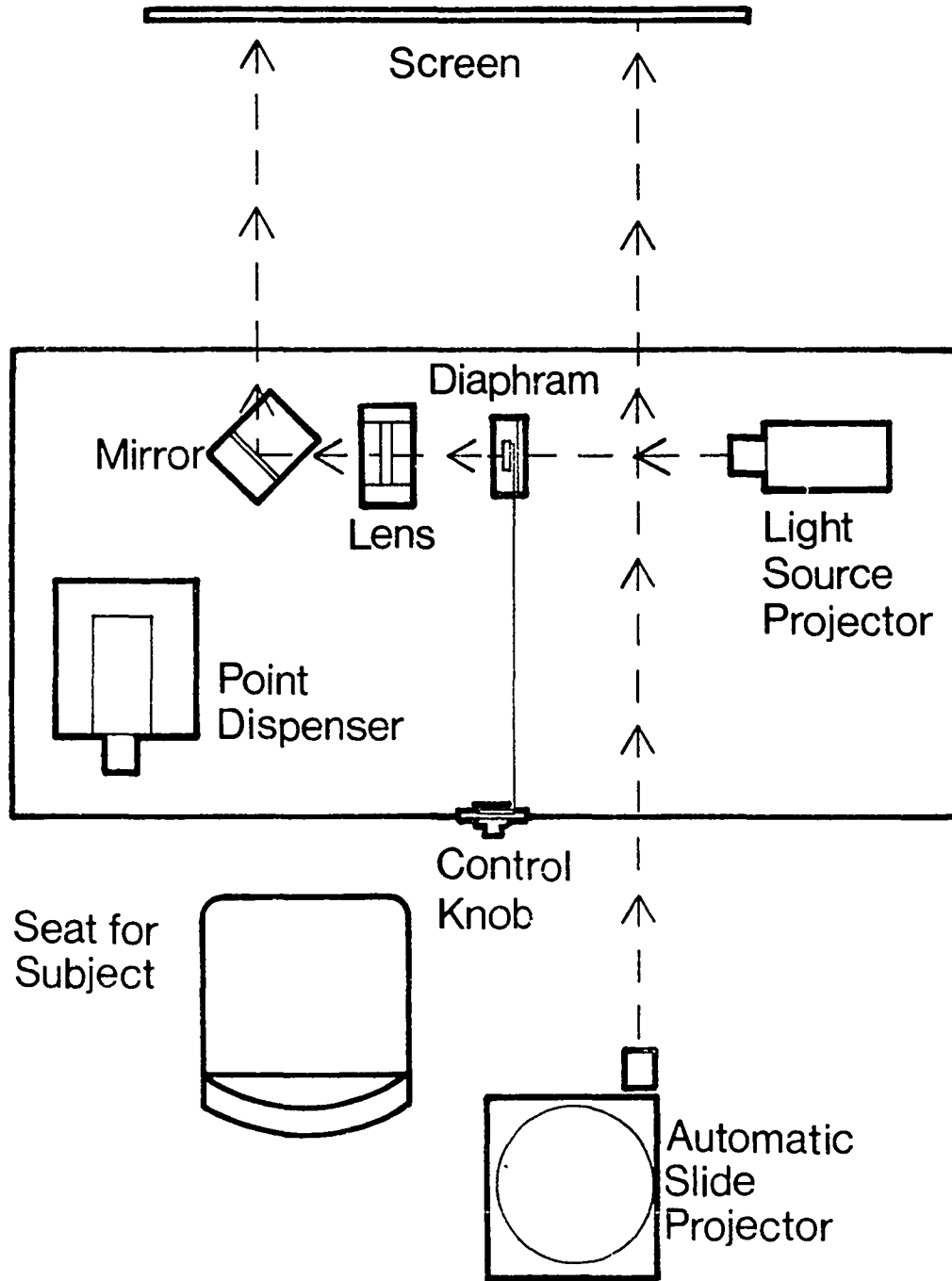


Figure 2. Schematic, overhead view of matching-to-sample apparatus and point dispenser.

protruding from the face of the box referred to as the automatic point dispenser. Each depression of the lever was counted on a response counter mounted above the lever. A small green light, next to the counter flashed briefly at each lever press. The experimenter was able to monitor the number of responses emitted by means of another response counter connected to the lever and mounted on the experimenter's control panel.

Procedure

The subjects, who had signed up in advance for specific testing times, came individually to the testing area. They were asked to read and sign a consent form, which had been approved by the Committee on Human Experimentation of the University of Hawaii. This form consisted of a general description of the procedure and an explanation of the legal and ethical rights of the subjects. To those whose reading ability was limited, the consent form was read aloud and explained in nontechnical language. Following this, a short demographic information form was completed, and the first half of the Rosenberg (1965) Self-Esteem Scale was administered. The second half of the measure was completed at the end of the session, following collection of the dependent variable data. Copies of the above forms are presented in Appendix B.

After completion of the consent, demographic, and first self-esteem forms, the subject received the \$2 payment. The sum was paid in advance so as to forestall any feeling that

the money was contingent on a certain level of experimental performance. A brief eye test then followed, consisting of identification of two block letters, an "E" and a "W", each 4.5 cm high, at a distance of 3 m. All subjects were able to perceive the letters.

Subjects were divided by sex and randomly assigned, by alternation, to one of three levels of feedback and one of two levels of modeling. The order of presentation of the feedback and modeling phases were counterbalanced, i.e., half of the subjects were exposed to the feedback condition first and then to the modeling condition, and for the other half, the order was reversed.

Feedback Phase. Each subject was seated at a table from which he or she could comfortably view a screen, 1.5 m in front, on which were projected the slides of ambiguous stimuli. The first training slide was shown and the subject was instructed that the task was to judge whether there was more white or more orange colored area in each stimulus pattern. Each was further instructed to make a response by pressing one of the two buttons in front of them, and if she/he were correct, the light would flash on and the chime would sound. No mention was made of the light/chime apparatus to those in the No Feedback Condition.

After making sure that each person understood the directions and responded correctly to the two training

slides, the slide presentation commenced. The experimenter set the automatic slide projector to change at 15 second intervals and retired behind a screen where he could monitor responses and provide feedback. Verbatim instructions for all phases may be found in Appendix C. Those subjects in the High Positive Feedback Condition received feedback, via the light/chime apparatus, that they were "correct" on 19 of the 20 trials (Trial 14 was designated "incorrect"). In addition, the experimenter dispensed high positive social feedback, after the last slide, in the form of a set phrase, "That was very good, Mr./Mrs./Miss _____! You did better than most persons your age!"

The subjects in the Low Positive Feedback Condition received feedback that they were "correct" on 9 of the 20 trials (Trials 1, 2, 5, 8, 10, 14, 15, 18, and 20). For this condition, the set phrase emitted by the experimenter was: "That was fine, Mr./Mrs./Miss _____. You did as well as most persons your age." Those in the No Feedback Condition made their responses without receiving any feedback.

Modeling Phase. The experimenter informed each subject that it would take a few minutes to set up the equipment for the next phase, and casually suggested that this short period of waiting might be spent in watching a videotape in which he, the experimenter, was interviewed about his research with older persons. The subject was seated in a chair and each watched the appropriate tape with seeming interest.

Measurement of Self-Reinforcing Responses. Each subject was seated at the table used in the feedback phase, with the viewing screen, the matching-to-sample apparatus, and the point dispenser in front of him/her. Each was told that this was a matching task in which they were to adjust the diameter of a circle of light so that it would match the size of a series of circles projected along side on the screen. The operation of the knob controlling the circle size was demonstrated, and each person turned the knob through its range several times for familiarization purposes. The training slides were projected, one at a time, and the subjects matched the size of the circle they controlled to that of the projected circle. They were told that they could reward themselves for correct matching by awarding themselves points on the "automatic point dispenser." The point dispenser apparatus was demonstrated, and the subjects were told that they could award themselves as many or as few points as they wished for each self-perceived correct match. Each was informed that the points could be exchanged later for a back-up reinforcer of their choice. The back-up reinforcers, on display at an adjacent table, consisted of canned goods such as corned beef, tuna, hash, pork and beans, and various breakfast cereals. These items each had a retail value of from 60¢ to 99¢.

The experimenter made sure that each person understood the directions, and could manipulate the apparatus before

setting the slide projector to automatically advance at 15 second intervals. The experimenter again retired behind the screen where he could monitor responding.

The experimenter returned to the testing area at the end of the 20 trials, administered the second part of the self-esteem scale, allowed each subject to choose a back-up reinforcer (all were told that they had awarded themselves a sufficient number of points to qualify for a prize), warmly congratulated each on having performed capably and successfully, and conducted an informal debriefing session. During this debriefing, the subjects were questioned as to their subjective feelings during the testing, especially during the feedback phase, and awareness of the true purpose of the experiment was probed (Orne, 1962). The purposes of the experiment were discussed in a general manner, each was promised a written summary of the results and cautioned not to discuss the procedures with friends or relatives who might also be subjects.

Two dependent measures were taken. They were: (a) total number of points self-awarded, over blocks of trials, and (b) number of trials in which self-reinforcement occurred.

CHAPTER III

RESULTS

Dependent Measure: Number of Self-Reinforcing Responses

The primary dependent measure was the number of self-reinforcing responses emitted by subjects over the series of 20 trials. The most salient finding was that subjects who were exposed to a model who self-reinforced emitted more than three times the number of self-reinforcements ($\underline{M} = 126.54$) than did subjects who were exposed to a model who did not self-reinforce ($\underline{M} = 41.09$). An analysis of variance was performed on the data from this dependent measure and the summary table is presented in Table 1. The analysis confirmed that the strong main effect of modeling was highly significant. An index of association, omega squared (ω^2), (Hays, 1963) was calculated for the modeling variable. The value obtained, $\omega^2 = .2505$, reflects the amount of variability accounted for by the experimental treatment--in this case, about 25% of the total variance. No other main effects or interactions of this ANOVA were significant.

No ethnic comparisons in responding had been planned for this study. However, during data collection it was observed that the total number of self-reinforcing responses seemed to vary as a function of membership in one of the three major ethnic groups represented in this study. These

Table 1
 Summary Table of Analysis of Variance:
 Number of Self-Reinforcing Responses

Source	df	MS	F	ω^2
Feedback (A)	2	519.0000	0.0472	
Modeling (B)	1	341641.0000	31.0820**	.2505
Sex (C)	1	18780.0000	1.7085	
Order (D)	1	2812.0000	0.2558	
A X B	2	527.5000	0.0479	
A X C	2	1185.5000	0.1078	
B X C	1	21480.0000	1.9542	
A X D	2	7263.0000	0.6607	
B X D	1	89.0000	0.0081	
C X D	1	8.0000	0.0007	
A X B X C	2	10905.5000	0.9921	
A X B X D	2	16731.5000	1.5222	
A X C X D	2	24974.5000	2.2721	
B X C X D	1	98.0000	0.0089	
A X B X C X D	2	32575.0000	2.9636	
S(ABCD)	156	10991.5937		

** $p < .01$

three groups, Americans of European, Japanese, and Chinese ancestry, comprised 85% of the sample. An examination of the number of responses broken down by membership in these three ethnic groups revealed a differential pattern of responding seemingly as a function of ethnicity. In Table 2 are presented the means and standard deviations of number of self-reinforcements for the interaction of ethnicity and modeling.

An analysis of variance was performed on the self-reinforcement scores, blocking for membership in one of the three major ethnic groups, and using the independent variables of feedback, modeling and sex. This analysis (the summary is presented in Table 3) revealed that the main effect of ethnicity was significant, as was that of modeling. The interaction of ethnicity and modeling was of borderline significance ($p = .053$). A Newman-Keuls test for multiple comparisons showed that, overall, Chinese-American subjects emitted significantly more self-reinforcing responses ($p < .01$) than did Japanese- or European-Americans, who did not differ significantly from each other. A Newman-Keuls test performed on the Ethnicity by Modeling interaction revealed ethnic differences which depended on the modeling condition. In the No Modeled Self-Reinforcement Condition, there were no significant differences among the ethnic groups. However, in the Modeled Self-Reinforcement Condition, European-American subjects emitted

Table 2
Means and Standard Deviations: Number of Self-Reinforcing
Responses as a Function of Ethnicity and Modeling

Ethnicity	Modeling Condition					
	Modeled Self-Reinforcement			No Self-Reinforcement		
	<u>n</u>	<u>M</u>	<u>S.D.</u>	<u>n</u>	<u>M</u>	<u>S.D.</u>
European-Americans	29	70.58	41.09	28	46.14	46.58
Japanese-Americans	24	128.87	156.77	28	28.89	18.83
Chinese-Americans	27	178.77	161.93	17	48.29	59.02

Table 3
 Summary Table of Analysis of Variance:
 Number of Self-Reinforcing Responses
 with Ethnicity Variable Added

Source	df	MS	F	ω^2
Ethnicity (A)	2	47360.3435	4.4478**	.0633
Feedback (B)	2	213.3245	0.0201	
Modeling (C)	1	236279.5621	22.1897***	.1905
Sex (D)	1	15886.2500	1.4920	
A X B	4	6769.8380	0.6358	
A X C	2	31796.2070	2.9861*	.0736
A X D	2	4169.4220	0.3916	
B X C	2	1838.7650	0.1727	
B X D	2	7047.1425	0.6619	
C X D	1	23092.2660	2.1687	
A X B X C	4	5487.3468	0.5154	
A X B X D	4	9924.0363	0.9320	
A X C X D	2	4641.3515	0.4359	
B X C X D	2	146.4555	0.0138	
A X B X C X D	4	3095.2275	0.2907	
S(ABCD)	117	10648.2030		

* $\underline{p} < .06$

** $\underline{p} < .02$

*** $\underline{p} < .01$

significantly fewer self-reinforcements than did the Chinese-Americans ($p < .01$) or the Japanese-Americans ($p < .05$), who were not significantly different from each other.

The self-reinforcing responses were collected over 20 trials. When the total number of responses for each subject was broken down into four blocks of five trials each, a linear pattern of increasing responding over time emerged. This pattern was made clearer by examination of the Modeling by Blocks of Trials interaction, which revealed that this increase did not occur for both levels of the modeling condition, but only for the subjects who were in the Modeled Self-Reinforcement Condition (see Figure 3). Those subjects who observed the self-reinforcing model emitted progressively more responses, on the average, as the trials continued, while those subjects who had observed the non self-reinforcing model emitted about the same number of responses in each of the trial blocks.

A repeated measures analysis of variance showed that the main effects of blocks of trials was significant, $F(3,468) = 3.46$, $p < .02$. A Newman-Keuls Test performed on the means of the main effect of blocks of trials showed that the mean for Block 4 ($M = 24.04$) was significantly higher than for Block 1 ($M = 18.74$, $p < .01$). A trend analysis (by the method of orthogonal polynomials) disclosed a significant linear trend in the data, $F(1,468) = 10.70$,

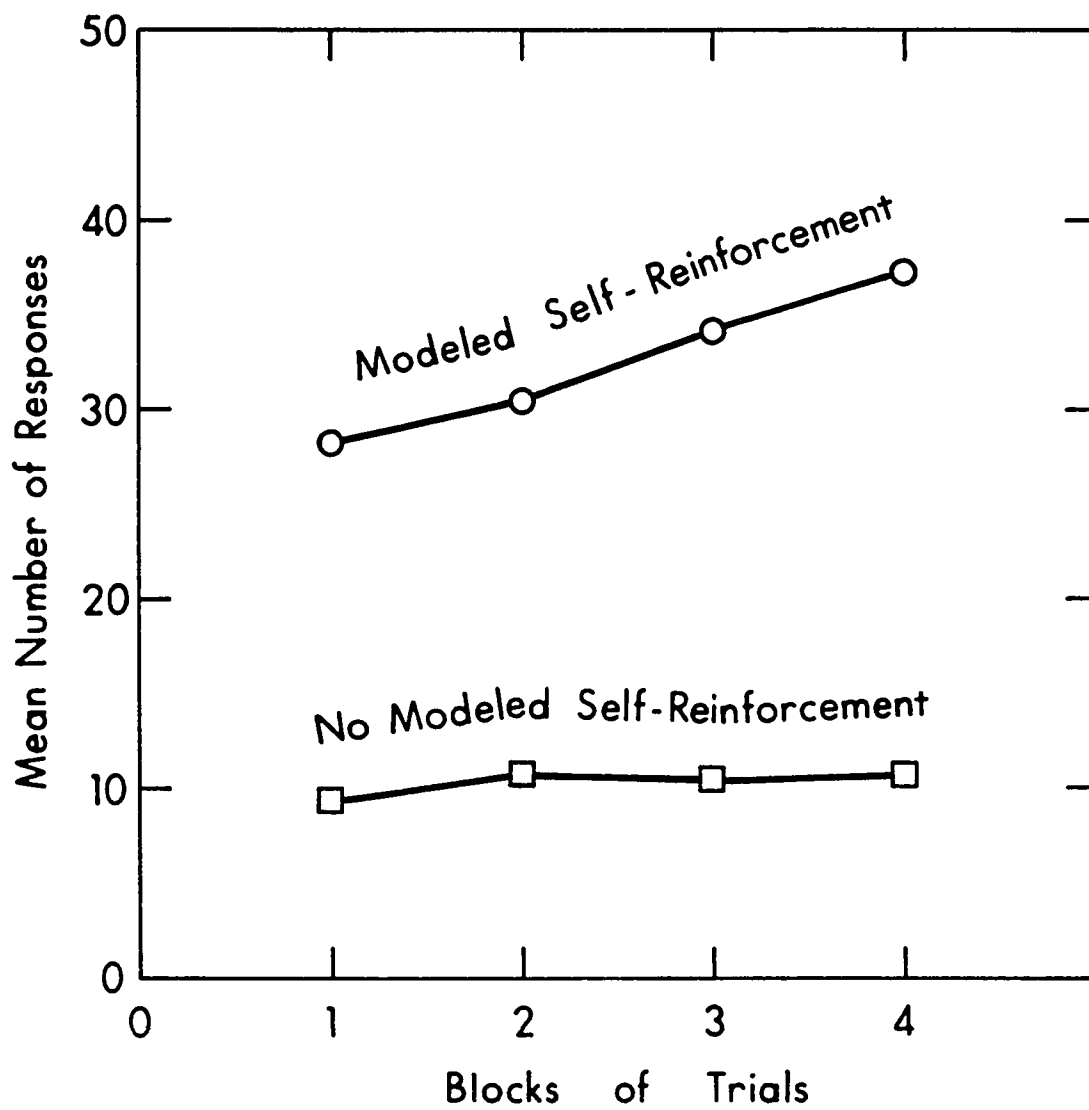


Figure 3. Self-reinforcing responses as a function of blocks of trials for modeling groups.

$p < .01$. The Blocks X Modeling interaction was marginally significant, $F(3,468) = 2.45$, $p = .063$. A Newman-Keuls Test performed on the means of this interaction revealed that the means of the modeling groups were significantly different from each other for each block of trials in each case ($p < .01$). The means for those in the No Modeled Self-Reinforcement Group did not vary significantly from each other over blocks of trials, however, in the Modeled Self-Reinforcement Condition, the means for the third ($p < .05$) and the fourth ($p < .01$) blocks were significantly higher than for the first block. In addition, the fourth block was significantly higher than the second block ($p < .05$). A trend analysis was performed on the Blocks X Modeling divergent interaction. The trend test revealed a significant linear trend, $F(1, 468) = 17.66$, $p < .01$, which indicated that the slope of the trend for one level of the modeling variable was significantly different from the slope of the trend of the other level.

Dependent Measure: Number of Self-Reinforced Trials

The second dependent measure taken was the number of trials during which the subject self-reinforced. Subjects in the Modeled Self-Reinforcement Condition self-rewarded on more trials ($M = 19.53$) than did those in the No Modeled Self-Reinforcement Group ($M = 19.00$). Responding also varied as a function of feedback, with those in the No Feedback Group self-reinforcing on the highest number of

trials ($\underline{M} = 19.62$), the subjects in the Low Positive Feedback Group self-rewarded on the fewest trials ($\underline{M} = 18.88$), and those in the High Positive Feedback Condition were in an intermediate position ($\underline{M} = 19.30$). An analysis of variance performed on the data from this dependent measure demonstrated that the main effects of modeling and of feedback were significant (the summary table is presented in Table 4). The absolute magnitude of the differences for this dependent measure were quite small, however, the obtained significances were due, in part, to the shape of the distribution of scores for this measure. The range of scores was restricted, with 96.7% of the scores between 15 and 20. This restricted range led to a low degree of variability which produced a very peaked distribution (kurtosis = 11.78). The characteristics of the distribution coupled with the large size of the cells ($\underline{N} = 90$ & 60 for the modeling and feedback variables, respectively) facilitated the findings of significant differences with relatively small absolute differences.

A Newman-Keuls test performed on the means of the feedback groups showed that the subjects in the No Feedback Condition self-reinforced on significantly more trials than did subjects in the Low Positive Feedback Condition ($\underline{p} < .05$).

Dependent Measure: Self-Esteem Scores

In order to determine possible effects of the experimental manipulations on the self-esteem of the subjects,

Table 4
 Summary Table of Analysis of Variance:
 Number of Self-Reinforced Trials

Source	2	MS	F	ω^2
Feedback (A)	2	8.1125	3.5551*	.1059
Modeling (B)	1	12.8000	5.2937**	.1159
Sex (C)	1	1.6540	0.6841	
Order (D)	1	0.6761	0.2797	
A X B	2	1.8010	0.7449	
A X C	2	2.8945	1.1971	
A X D	2	0.9480	0.3921	
B X C	1	0.1300	0.0538	
B X D	1	0.3660	0.1514	
C X D	1	1.0071	0.4165	
A X B X C	2	3.1190	1.2899	
A X B X D	2	1.4070	0.5819	
A X C X D	2	2.5500	1.0546	
B X C X D	1	0.9121	0.3773	
A X B X C X D	2	0.2450	0.1014	
S (ABCD)	156	2.4180		

* $\underline{p} < .04$

** $\underline{p} < .025$

a split-half version of the Rosenberg (1965) self-esteem scale was administered. All subjects answered the five questions of the first half of the scale (SE-1) before the testing, and the second half (SE-2) at the end of the experimental session. The total score (SETOT) was also computed. A comparison of the mean of SE-1 ($\underline{M} = 16.50$) with the mean of SE-2 ($\underline{M} = 15.42$) revealed a significant difference, $t(179) = 7.13$, $p < .01$. In an attempt to determine if this significant decrease was a function of the experimental conditions, or was artifactual, an analysis of covariance, and an analysis of variance of change scores (SE-2 - SE-1) were performed. The analyses revealed no significant main effects or interactions, which indicated that the decrease in mean score from part one to part two was not due to the experimental manipulations.

The self-esteem measure had been administered, for comparison purposes, to a group of 103 undergraduate students (mean age = 21.5 years) at the University of Hawaii, Manoa. A comparison of the SE-1 and SE-2 scores for the college age group showed that the SE-1 mean ($\underline{M} = 15.24$) was significantly higher than the SE-2 mean ($\underline{M} = 14.92$), $t(102) = 2.34$, $p = .021$. In addition, the young and old groups were compared to each other on each part of the self-esteem measure. This comparison is presented in Table 5.

From Table 5 it can be seen that the self-esteem means of the older persons were significantly higher than the

Table 5
Means and Standard Deviations:
Self-Esteem Scores, Young and Old Subjects

Group	Self-Esteem Scores					
	SE-1		SE-2		SETOT	
	M	S.D.	M	S.D.	M	S.D.
Old	16.50**	2.19	15.42*	2.37	31.91**	4.11
Young	15.24	2.16	14.92	2.50	30.17	4.47

* $\underline{t} < .10$

** $\underline{t} < .01$

means of the younger group on the first half and total scores, and marginally higher on the second half. No significant differences were found between the major ethnic groups in the elderly sample on the basis of their total self-esteem scores.

Correlates of Self-Reinforcement and Self-Esteem

An intercorrelation matrix was calculated of all the variables used in this study. In order to preserve the correlational assumptions of linearity and continuousness of variables, all qualitative variables were first dichotomized (e.g., Birthplace; foreign = 0, U.S.A. = 1). Of the total 21 variables, there were 15 that correlated significantly with each other. They are as follows: self-esteem, parts 1, 2, and total; number of self-reinforcements

emitted in each of the four blocks of trials and total; years of education; major occupation during work years; ethnicity; birthplace; place where major part of life was spent; current marital status. The significant correlation coefficients are presented in Table 6. From this table it is evident that there is a strong positive relationship between self-esteem and major life occupation category. The occupational variable was dichotomized by grouping executives, administrators, entrepreneurs, and professionals in one category and all other work classifications into a second category (i.e., executives, etc. = 1, all other = 0). A significant relationship was found also between occupation and the number of self-reinforcements emitted. Number of years of education was strongly related to self-esteem scores, and the demographic variables of education and occupation were significantly related to each other, $r(180) = .44$, $p < .01$. Both ethnicity and marital status were moderately but significantly related to self-reinforcement, and significantly related to each other, $r(180) = .22$, $p < .01$, because a higher percent of non-Caucasian than Caucasian subjects were married. Whether a person spent the major part of his/her life in a foreign country was related to the number of self-reinforcements awarded, with significant negative correlations between living in the U.S.A. and self-reinforcement. Place of birth was significantly related to the number of trials on which a subject self-reinforced,

Table 6
Significant Correlations Between Demographic and Dependent Variables

Dependent	Demographic					
	Major Occupation in Life	Years of Education	Ethnicity	Marital Status	Place where Spent Major Part of Life	Birth-place
Self-Esteem Part 1	.37**	.22**	--	--	--	--
Self-Esteem (Part 2)	.34**	.33**	-.19**	--	--	--
Self-Esteem (Total)	.39**	.31**	--	--	--	--
Self-Reinf. (Block 1)	.19**	.15*	--	.15*	-.16*	--
Self-Reinf. (Block 2)	.16*	--	.15*	.14*	-.14*	--
Self-Reinf. (Block 3)	.19**	--	.16*	.14*	-.18**	--
Self-Reinf. (Block 4)	.23**	.13*	.16*	--	-.18**	--
Self-Reinf. (Total)	.20**	--	.15*	.14*	-.19*	--
No. of Trials Self-Reinf.	--	.13*	--	--	--	.15*

* $p < .05$
** $p < .01$

Note: $\underline{n} = 180$

those born in the U.S.A. self-reinforced on more trials. The significant coefficient for ethnicity and SE-2 indicated that the scores for Caucasians were higher than for non-Caucasians on the second part of the self-esteem measure.

Summary of Results

1. Both the number of self-reinforcing responses emitted and the number of trials in which self-reinforcement occurred were a function of the modeling condition to which the subjects had been assigned. Those who observed a model who self-reinforced awarded themselves significantly more rewards, and self-reinforced on significantly more trials than did those subjects who had observed a non self-reinforcing model.

2. The number of self-reinforcements emitted was a function of ethnicity, in that Chinese- and Japanese-American subjects emitted significantly more self-reinforcements than did European-Americans in the Modeled Self-Reinforcement Condition, while members of these three ethnic groups did not differ from each other in the No Modeled Self-Reinforcement Condition. Overall, subjects of Chinese ancestry self-reinforced more than did members of the other major ethnic groups.

3. Over blocks of trials there were significant increases in the number of self-reinforcements, with a significant linear trend. This linear increase was restricted to those subjects in the Modeled Self-Reinforcement

Condition, while the means of the No Self-Reinforcement Group did not vary significantly over blocks of trials.

4. Self-reinforcement did not vary as a function of feedback, except in the number of self-reinforced trials dependent measure, and then in an unexpected manner. Those in the No Feedback Condition responded on the most number of trials, and subjects in the Low Positive Feedback Condition on the fewest trials, with High Positive Feedback being intermediate.

5. Self-esteem scores, on the average, declined between the pre- and the posttest. However, there was no evidence that this drop was due to the experimental manipulations. The scores of college age subjects were also significantly lower for the second part of the test, as compared to the first part, without experimental intervention. The self-esteem scores of the elderly subjects were, overall, significantly higher than those of the college age group.

6. Significant correlation coefficients were obtained between several of the demographic variables and the dependent measures. The strongest series of relationships was demonstrated between the major life occupation of the subjects and the self-esteem and self-reinforcement measures. Those subjects who had been in occupations typically considered to be of high status had higher self-esteem scores and emitted more self-reinforcements than those who had been

engaged in lower status occupations. However, the correlation coefficients between self-esteem and self-reinforcement were nonsignificant. Residence, in terms of foreign or domestic, and ethnicity and marital status were all related to self-reinforcement.

CHAPTER IV

DISCUSSION

The most salient findings of this study emerged from the manipulation of the modeling variable. Subjects who were briefly exposed to a model who self-rewarded emitted significantly more self-reinforcing responses, and self-reinforced on significantly more trials than did a group of subjects who observed a nonself-reinforcing model. Additionally, there were significant overall linear increases in responding over trials. However, this effect was due to increased self-reward over time for those who had been exposed to the self-reinforcing model, whereas the subjects who had observed a model who did not self-reinforce showed no increased responding over trials. The power of the modeling manipulation was revealed, also, in the unexpected finding of ethnic differences in self-reinforcement. Americans of Chinese and Japanese ancestry emitted significantly more self-reinforcers than did European Americans in the Modeled Self-Reinforcement Condition. However, there were no significant differences among these three ethnic groups for those subjects in the No Modeled Self-Reinforcement Condition. Overall, Chinese-Americans emitted more self-reinforcers than did the Japanese- or European-Americans.

Feedback was not demonstrated to be effective as a facilitator of self-reward. There were no differences in the number of reinforcers self-awarded for any of the three feedback groups. However, for the dependent measure, number of trials in which self-reinforcement occurred, there was a significant main effect of feedback, but it was in an unexpected direction. Those in the No Feedback Condition responded on significantly more trials than did the subjects in the Low Positive Feedback Condition.

Self-reinforcement did not vary as a function of sex of subject, nor of order of presentation of the modeling and feedback variables. Self-esteem levels of the subjects were not related to self-reinforcement rates, nor did the experimental manipulations affect prior self-esteem. Several significant correlation coefficients were obtained between demographic variables and dependent measures.

The finding that those persons who were exposed to a model who self-reinforced emitted more self-reward behavior than those exposed to a non self-rewarding model, supported the hypothesis for the modeling variable, and corroborates the many studies (e.g., Bandura & Whalen, 1966) that have shown modeling to be effective in the transmission of patterns of self-reinforcement. Furthermore, the results of this study provide evidence that persons 65 and older can benefit from intervention techniques employing modeling in the acquisition or reacquisition of behavioral sequences.

To this point there has been no direct evidence that elderly persons could learn through observation. Moreover, it had not been obvious that modeling would be a viable technique for teaching the elderly because observational learning entails several subprocesses such as: (a) the attention to, and perception of, modeled actions, (b) the coding and symbolic representation in memory of the perceived experiences, and (c) the ability to motorically reproduce and integrate the response patterns into meaningful actions (Bandura, 1974). These components presuppose a certain level of physical and mental competence on the part of the observer. However, at least for this sample of older persons, a single, relatively brief (1 min., 45 sec.) exposure to a televised model who self-reinforced sufficed in dramatically increasing the self-reinforcing behavior of one group (Modeled Self-Reinforcement) as compared to the other group (No Modeled Self-Reinforcement) who saw a non self-reinforcing model.

To state that modeling was responsible for the rather large differences in self-reinforcing behavior exhibited by the two modeling groups is to give a description rather than an explanation of the findings. According to Bandura (1971b), modeling can produce three separate types of effects depending on the processes involved. First, observers can acquire new patterns of behavior by watching the performances of others (e.g., Bandura, Ross & Ross, 1963). Second, there

can be inhibitory effects resulting in reduction in a modeled class of behavior, or a general decrement in responding as a result of seeing the model's behavior produce punishing consequences (e.g., Walters & Parke, 1964). Third, disinhibitory effects are evident when observers increase the performance of previously inhibited behavior after observing models engage in such behaviors without adverse consequences (e.g., Bandura, 1965).

It is likely that self-reinforcement was viewed initially as a behavior to be inhibited by the subjects in this study. Spontaneous remarks made by the subjects during the instructions in the self-reinforcement phase indicated that many of these elderly persons viewed the self-dispensing of rewards as a behavior in which they should not frequently or lavishly indulge. In many cases the experimenter had to reassure the subjects that giving themselves points for correct matching responses was perfectly all right, and they were not violating any rules by doing so. The permissive attitude of the experimenter towards self-reward in conjunction with the viewing of a model who engaged in previously inhibited behavior may have had a strong disinhibitory effect. In other words, the modeled self-reinforcement gave the subjects "permission" to self-reward. These findings are similar to those of a previously cited modeling study (Bandura, 1965), and of a study of direct reinforcement (Crandall, Good & Crandall, 1964) in which

no reaction by an adult to previously disapproved behavior on the part of children functioned as a positive reinforcer and increased the formerly socially disapproved responses. Therefore, the observation of a model who self-reinforced without punishment or censure may have functioned as a positive vicarious reinforcer, and in this way, increased the probability of the self-reinforcement response.

Hoffman (1970) succinctly summarized the findings regarding disinhibition and modeling when he stated, "The most clear-cut conclusion to emerge from our analysis of the experimental findings on imitative modeling is that direct observation of a model who yields to temptation and deviates from a social norm or prohibition has a disinhibiting effect on the observer, whether the model is rewarded or not (p. 316)."

In sum, for the subjects in this study, it was likely that what was learned through observation was not the acquisition of a new sequence of responses labeled self-reinforcement. Rather, it is probable that the increased self-reward following viewing of modeled self-reinforcement was due to the disinhibitory effect of vicarious positive reinforcement.

There is further evidence to support the conclusion that the significant modeling effects in this study may be attributed to the process of disinhibition. The significant main effect of increased responding over trials corroborates

previous research (Felixbrod & O'Leary, 1973; Karoly & Kanfer, 1974) which has shown that self-reinforcement rates increase over time. Felixbrod & O'Leary suggested that this change may occur when, "Persons can discriminate that no externally administered aversive consequences will follow the self-imposition of lenient performance demands (pp. 250-251)." However, in the present study, the Trials effect was due solely to the performance of the Modeled Self-Reinforcement Group. An examination of the Trials by Modeling interaction showed that the increase in responding over trials occurred only for those who had observed a self-reinforcing model. Those who viewed a non self-rewarding model displayed no increase in self-rewards over blocks of trials. Therefore, observing a model who self-rewarded without visible aversive consequences served not only to disinhibit responding for that group, but the disinhibition increased over time.

The design of this study did not include comparisons of ethnic differences in responding. However, during data collection it became evident that there were differences in the number of points self-awarded as a function of ethnicity, in that Asian-American subjects seemed to be self-rewarding more than Caucasian-Americans. Analysis of variance confirmed this observation, and it was found that, overall, Chinese-American subjects (N = 44) emitted significantly more self-rewards than did Japanese-Americans (N = 52) or

European-Americans (N = 57) who did not differ from each other. These findings were sharpened and clarified by the examination of the Ethnicity by Modeling interaction which revealed no ethnic differences in the No Modeled Self-Reinforcement Condition. However, in the Modeled Self-Reinforcement Condition, Chinese-Americans emitted the most responses, European-Americans the fewest, and Japanese-Americans were in an intermediate position. This finding of rank order in differences between the three major ethnic groups is consistent with the results of Sue (1973), who found that Japanese-American students consistently fell into an intermediate position between Chinese-American and European American subjects on measures of personality, vocational interests, and academic abilities. Sue suggested that Japanese values may be more similar to European-American values than are those of the Chinese. This may be the result of differential acculturation patterns of the Asian-American groups, however, this reasoning is speculative since there are no data at present comparing the acculturation of Chinese- and Japanese-Americans to each other.

Not only are the data on Asian-Americans sparse, the research on elderly Asian-Americans is almost nonexistent (Kalish & Yuen, 1971). Therefore, it will be necessary to proceed largely in a speculative manner in attempting to explain the considerable ethnic differences in self-reinforcing behavior found in this study.

Since there were no significant differences in self-reward for the group which saw no modeled self-reinforcement, it is possible there are ethnic differences in susceptibility to modeling. Some evidence to support this view comes from a field study by Huang and Harris (1973) in which imitation, as a measure of conformity, was examined for Chinese subjects in Taiwan, and American subjects in New Mexico. It was found that the Chinese imitated a model more than did the Americans, and that a high status model was imitated more than a low status model, and the latter effect held especially for the Chinese. However, a later experiment (Huang & Harris, 1974), using the same subject populations, in which modeled helping behavior was the dependent measure, failed to replicate the modeling effect. There were no ethnic differences in modeled behavior in the second experiment."

Cultural differences, however, would seem to be causal insofar as the influence of the self-reinforcing model is concerned. Chu (1966, 1967) found that Chinese in Taiwan were more persuasible than Americans, and also more submissive to authority. Fenz and Arkoff (1962) found that students of Chinese and Japanese ancestry possessed higher "needs for abasement" than did European-Americans. In general, Asian-Americans appear to be more obedient, conforming, and dependent than Caucasians (Sue, 1973). These traditional Asian cultural values could have operated in this study to produce higher levels of imitative responding for members of the

Asian ethnic groups in comparison to those in the Caucasian group. Additionally, it has been documented (e.g., Bandura, 1971b) that models who are high in prestige are imitated to a greater degree than models of lower standing. This is probably the result of a generalization process in which the behavior of a high status model is more likely to be successful in achieving desired outcomes, and therefore, has greater value for the observer. It is possible that because the model, in this study, was Caucasian, high prestige value was attached to her performance by the elderly Japanese- and Chinese-American subjects who may have been socialized to regard Caucasians as higher prestige than themselves. Therefore, the characteristics of the model may have been more effective in facilitating imitative responding for the Asian- than for the Caucasian-American subjects.

An alternative explanation of the ethnic differences in self-reinforcement might be presented in motivational terms. Kimbrell and Blake (1958) found that the disinhibiting effects of modeling increased with the intensity of the observers' drive state (i.e., deprivation level). Schachter and Singer (1962) and Bandura and Rosenthal (1966) have also found that arousal enhanced the modeling effect. It is possible that the Japanese- and Chinese-American subjects in the present study were in a greater state of deprivation than were the European-Americans in regard to environmental

reinforcement, and would, therefore, be more likely to respond to the facilitating or disinhibitory modeling effects than would the Caucasians.

A third possible explanation lies in the early socialization experiences of the respective groups. The research on self-reward has shown that children can easily acquire the criteria for self-reinforcement (e.g., Bandura & Kupers, 1964) and furthermore, the leniency or stringency of the socializing agent can influence the future magnitude of self-generosity (e.g., Kanfer & Marston, 1963b). Masters and Christy (1974) found a high degree of individual consistency in the number of tokens self-dispensed contingently on a variety of tasks. They suggested that children acquire a high degree of internal individual consistency for self-reinforcement, and this consistency is acquired through the socialization process. It is possible that consistent socialization patterns accounted for the ethnic differences observed in this study. However, there are no data to support this speculation, and the traditional Asian family values which emphasize reserve, restraint and inhibition (Sue, 1973) would seem to argue against this explanation.

Success feedback on a prior task did not serve to facilitate subsequent self-reinforcement. No significant differences were found in number of self-reinforcements among the groups which received high or low positive feedback or no feedback at an ambiguous discrimination task. This finding

of no difference was contrary to prediction, and to the results of the studies which found that success feedback enhanced subsequent self-reward (Isen et al., 1973; Mischel et al., 1968; Underwood et al., 1973) through the raising of positive affect which worked to make the subjects more generous towards themselves. Additionally, the feedback findings in the present study were not supportive of the results of Bellucci and Hoyer (1975) who found feedback to be effective in increasing the self-reinforcing behavior of elderly subjects. There was a difference, however, in that Bellucci and Hoyer used noncontingent verbal feedback, and in the present study the feedback was contingent on ostensible correctness at a task and was primarily nonverbal (i.e., a light and tone signified correctness) in character. The lack of differences between the feedback manipulation groups was consistent with the findings of the studies (Hoyer & Cone, 1974; Hutchinson, 1974; Lair & Moon, 1972) which revealed that the performances of elderly subjects were unaffected by false external feedback.

Why didn't the feedback manipulation influence subsequent self-reward as had been predicted in the present study? There are several explanations possible. First, it has been suggested by Bandura (1971a) that performance knowledge, in and of itself, does not have inherent rewarding value, but assumes positive or negative qualities only when evaluated by the person in reference to his/her intrinsic

standards. In other words, lights or tones signifying correctness are not themselves rewarding, they have to be related to attainments which exceed personal standards of what constitutes a worthy performance. This suggestion by Bandura is consonant with the hypotheses of Brickman, Lisenmeier, and McCareins (1976) who classified feedback as relevant or irrelevant on the basis of the subject's evaluation that the success or failure experienced is predictive of how he/she will perform in the future. The feedback which leads the individual to expectancies of future consistency of behavioral consequences can be considered relevant and therefore influential on later performance. Whereas, feedback which the subject considers irrelevant because of luck or unusual circumstance will not affect future performance. The inference made by the subject will generally be based on factors such as the similarity of the content of the two tasks, the difficulty of one relative to the other and so on. Brickman et al. found that subjects who received irrelevant success did significantly worse than those who received relevant success and also worse than those who received relevant or irrelevant failure.

It is possible that in the present experiment, the subjects perceived the feedback task as trivial, and therefore, correctness was not regarded as reward, nor failure as punishment. Or, the feedback phase was so distinct and

different from the matching-to-sample task which involved self-reinforcement, that the prior feedback was regarded as irrelevant success or failure, or, because the ambiguous stimuli used in the feedback task were so difficult to judge (in actuality, they were indiscriminable) that being correct was equated with luck which made the feedback completely irrelevant.

Another possible explanation for the lack of a feedback effect is that what had been labeled and designed as high and low positive feedback were actually both negative or punishing feedback. In the High Positive Feedback Condition, 95% of the responses were signaled "correct." However, it was noted that the subjects, when congratulated for superior performance, according to the set phrase by the experimenter, often replied, "But I got one wrong!" or "I didn't get them all right." Those in the Low Positive Feedback Condition who received false feedback that 45% of their judgments were correct often complained of how poorly they did when told (by means of the standard phrase) their performance was average for their age. The significant main effect for feedback on the secondary dependent measure of number of trials in which self-reinforcement occurred tends to confirm the suggestion that neither high nor low positive feedback was rewarding for these subjects. The findings revealed that persons in the No Feedback Condition self-reinforced on significantly more

trials than those in the Low Positive Feedback Condition, with the High Positive Feedback subjects in intermediate place. The rank order sequence of the levels of feedback suggests that Low Positive Feedback acted as failure and depressed subsequent self-confidence which decreased the number of trials in which self-reinforcement took place, for subjects had been cautioned to award themselves points only for a successful match to sample. The High Positive Feedback Condition also seemed to depress the frequency of trials in which self-reward took place, relative to the No Feedback Condition, although the difference between the latter two levels was nonsignificant.

A third alternative explanation for the lack of feedback effects may be due to the possibility that older persons are less responsive to and influenced by external feedback than are younger individuals, as has been suggested by the findings of a number of investigators (e.g., Lair & Moon, 1972). However, the finding of significant differences in the frequency of self-reinforced trials tends to negate this explanation. In addition, during the debriefing period subjects (in the High and Low Positive Feedback Groups) were asked how they had felt when they had been "correct" and "incorrect" in that phase of the study. Almost unanimously, they indicated, with words like "happy," "good," "smart," "self-confident," and "rewarded" that signaled correctness had increased their positive emotional responding. When

false feedback indicated they were incorrect, they reported feeling "dumb," "bad," "like trying harder," "that my eyes were no good," and "aw, shucks." It appears, therefore, that the elderly persons in this study were not unaffected by the feedback manipulation, but were responding in an appropriate affective manner. However, the heightened affect was not translated into changes in self-reinforcing behavior. This was contrary to the findings which indicated that positive affect facilitated self-reinforcement (e.g., Mischel et al., 1968). The lack of effectiveness for positive feedback in enhancing self-reward was due, possibly, to some inadvertent flaw in operationalizing the feedback variable, rather than to the age or condition of the subjects.

No differences were found in responding based on the sex of subjects. This corroborates most of the studies on self-reinforcement which have used sex as an independent variable (e.g., Liebert & Allen, 1967). The finding of sex differences in responding on a self-reinforcing measure have probably been due to methodological procedures which emphasized physiological differences between the sexes (e.g., Bandura & Perloff, 1967).

The systematic variation of the order of presentation of the modeling and feedback variables produced no significant differences. This variable had been included to increase experimental control, specifically internal validity (see Campbell, 1972), and to determine if the saliency of

the modeling variable, as reported in other studies (e.g., Bandura & Whalen, 1966) could be attributed to an artifactual recency effect. No evidence of either recency or primacy effects were found.

There were no apparent effects of the experimental manipulations on the self-esteem scores of the subjects in this study. It was found, overall, that there was a significant decrease in mean score values for the second half of the test as compared to the first half. Analyses revealed that this decrease was not due to any of the experimental factors. It is probable that this difference between halves was due to ethnic differences in answering on part two. Although item analysis was not performed on the self-esteem measures, it was observed that many Asian-Americans answered two of the questions on the second half ("I wish I could have more respect for myself" and "At times I think I am no good at all") in the direction which would indicate a low self-esteem score. This observation is supported by two pieces of evidence: (a) a significant negative correlation was found ($-.19, p < .01$) between ethnicity and self-esteem scores only for part 2 of the measure, indicating Caucasians had higher scores than did non-Caucasians, and (b) a younger, but ethnically similar group, who were not exposed to the experimental conditions, also displayed significant decreases on the second half of the self-esteem measure. This finding would

be consistent with the results of studies (Arkoff, Meredith, & Iswahra, 1962; Fenz & Arkoff, 1962) which indicate that persons of Japanese and Chinese ancestry have a tendency to regard themselves with a good deal of modesty, and, in general, exhibit more verbal self-abasement than do European-Americans.

Examination of the relationships between the demographic and the experimental variables revealed that the highest correlation coefficients were obtained between major occupation in life, years of school, and total self-esteem score. This finding of strong relationships between high self-esteem scores, high status occupations, and high number of years of education would seem to indicate, that for this group of elderly subjects, self-esteem was a rather stable characteristic, not subject to fluctuations due to minor changes in the current situation. This is consistent with findings (Baron, 1970; Diggory, 1966; Herbert et al., 1969; Wylie, 1961) which suggest that self-esteem is based largely on past achievements, accomplishments and successes in the environment (i.e., past reinforcement history) rather than experimentally induced, short term success/failure. Self-esteem was not related to self-reinforcement, nor were there ethnic differences in total self-esteem scores.

The finding that self-esteem scores were significantly higher for the elderly subjects in this study than for a

group of college-age students was consonant with those studies which have found that self-esteem does not decline as a function of age (e.g., Trimakas & Nicholay, 1974).

A number of Significant correlations of moderate magnitude were found between the dependent measures of self-reinforcement and some demographic variables. The total number of self-reinforcing responses was positively related to major life occupation, with persons grouped in the professional-executive category self-reinforcing more than persons in lower status occupational groups. As noted above, self-esteem was also positively related to occupation, although self-reinforcement was not directly related to self-esteem, contrary to the findings of Rechly and Mittman (1973). The relationship that was found between ethnicity and self-reinforcement has been discussed previously. Marital status and self-reinforcement were positively correlated. This relationship can be explained by the fact that a higher proportion of Asian-Americans than Caucasians were married, and the Asian-Americans self-reinforced more than did the Caucasians. Those subjects who had spent the greater part of their lives in a foreign country emitted more self-reinforcements than those who had lived all their lives in the U.S.A., suggesting, perhaps, a greater state of deprivation. However, those born in the U.S.A. self-reinforced on more trials than did those who were foreign born. There are at present no data

which can explain the relationships between the demographic variables and self-reinforcing behavior. The oft-stated cliché regarding the need for further research is nowhere more pertinent than in the area of the effects of prior life experience on the self-reinforcing behavior of elderly subjects, especially those of Asian descent.

Conclusions and Implications

At this point it would be appropriate to interject several cautionary notes regarding the generalizability of the results of this study to the entire population of the elderly. First, as has been noted, all subjects were volunteers. The act of volunteering imposes a self-selection, and therefore, biasing aspect to the investigative process (Rosenthal & Rosnow, 1975). Second, almost all of the subjects were members of one or more voluntary organizations, such as senior citizens clubs, church groups, etc. It has been found (Christie, 1954; Sanford, 1950) that persons who belong to formal organizations differ attitudinally (e.g., higher on measures of authoritarianism) from persons who belong to no organizations. Third, persons of Chinese ancestry comprised 24.4% of the subjects in this study, whereas they account for only 4.9% of the population of the State of Hawaii, and are only fractionally represented (.2%) in the population of the entire U.S.A. (Census Bureau, 1970). The Chinese-Americans in this study emitted

significantly more self-reinforcing responses than did the other major ethnic groups, and were probably responsible for the very large obtained differences between the two modeling groups. Therefore, it would be prudent to replicate this study in the continental United States with a sample more representative of the entire aged population than was obtainable for this study. On the other hand, the extreme paucity of data on elderly Asian-Americans (Kalish & Yuen, 1971) lends interest to the findings of the present investigation.

Bearing in mind the cautionary notes stated above, a number of concluding comments can be made. First, self-reinforcement holds promise as a therapeutic or prosthetic intervention technique for use with those elderly whose environments are characterized by a relative deficiency in external reinforcement. The subjects who were exposed to the self-reinforcing model displayed rapid and effective acquisition of self-reinforcing behavior. There appears to be no doubt that intact older persons can be taught to self-reward contingently. Moreover, the self-reinforcement process holds potential for benefit in at least three ways: (a) the increased reinforcement, material and nonmaterial, will serve to enhance the satisfaction and well-being of those elderly whose environments are lacking in reinforcement; (b) self-reinforcement can be used in the modification of behavioral deficits particular to aging, as an adjunct to

conventional behavior therapy techniques; (c) standard setting has been viewed as the key component in self-reinforcement (Premack & Anglin, 1973), and standard setting has been shown to have reinforcing properties (Weiner & Dubanoski, 1975). Recent research in institutional settings for the aged (Langer & Rodin, in press; Schulz, in press) has shown that choice and perceived environmental control resulted in improved alertness, participation and a general sense of well-being for the experimental groups as compared to comparison groups. Therefore, self-reinforcement, through the choice involved in the standard setting component, could furnish a sense of control and personal efficacy which could alleviate feelings of helplessness and hopelessness that can occur with increasing age. Striking evidence of the relation between perceived control and well-being in geriatric patients is furnished by Ferrare (cited in Zimbardo & Ruch, 1975) who found that of 17 subjects who perceived they had no control over their move to an old age home, 16 had died after 10 weeks of residence. By comparison, among residents who voluntarily moved to the home, only one died during that period. It is possible, therefore, that some of the negative consequences of aging may be retarded or even reversed through the enhancement of personal responsibility and choice for elderly persons, and that self-reinforcement is one method of providing a sense of personal competence for this population.

This study also demonstrated that the use of modeling techniques was an effective method for the transmission of patterns of self-reinforcement. It is possible that observational learning, especially via television or videotape, is a method that deserves further investigation in the teaching of older persons. As a direction for further research, a comparison of the efficacy of traditional teaching methods with those that rely heavily on televised content might be attempted using older persons as subjects. The typical findings of behavioral deficits of elderly adults engaged in learning tasks (e.g., Canestrari, 1968) might be subject to revision with the increased use of television. For older viewers, TV is a dependable medium often used as compensation for lack of other modes of interaction in their lives. Therefore, the elderly are more likely to accept information delivered via TV than are younger persons (Davis, 1975).

Additionally, elderly subjects were shown to be quite capable of imitative behaviors which required the active processes of attention, symbolic coding, retention, and motoric reproduction. There is a large body of research evidence demonstrating that children and young adults can acquire patterns of behavior, attitudes, and emotional responses through exposure to modeled stimuli (Bandura, 1971b), but until this study there was no evidence that the social learning model is applicable to the older age groups.

The suggestion by Duke et al. (1974) that the social learning principles may be differentially applicable to older populations was not supported by the present findings.

The implications of the present study are quite straightforward. Self-reinforcement appears to be a feasible and potentially useful technique for the amelioration of environmental factors which reduce well-being in the elderly. It is probable that the observation of modeled stimuli is an effective method for the facilitation and enhancement of self-reward in older persons.

Self-reinforcement is but one component in the self-management process. Further investigation of the components in this process, and of the variables related thereto is, of course, warranted.

Growing old is accompanied by losses and hazards. A legitimate goal of gerontological research should be the understanding and minimization of such perils.

APPENDIX A

VIDEOTAPES SCRIPT

VIDEO	AUDIO
Fade in to LS of Host & Guest	Voice of Announcer is heard over
Cut to MS of Hessberg	ANNOUNCER: Good afternoon. Welcome to Psychology Tomorrow, the show that explores topics and trends in psychology. Our host today is the noted psychologist, Dr. Ferne Hessberg. The topic is aging and Dr. Hessberg will be talking to Mr. Howard Weiner, who is studying behavior of older persons.
Cut to MS of Weiner	
Cut to MS of both	HESSBERG: Good afternoon, Mr. Weiner. It's so nice to have you with us today. Could you tell us something about your research with the mature person.
Shots as needed	WEINER: Certainly, Dr. Hessberg. I always enjoy talking about my favorite topic, gerontology, which, as you know, is the study of aging.
	HESSBERG: Isn't gerontology a rather new field of study?
	WEINER: Yes, it is only in the past 20 years that we have started to scientifically look at the behavior of mature adults and their specific problems, but it is an area of growing importance and great future significance.
	HESSBERG: Why is that, exactly?

Note: LS = Long Shot
MS = Medium Shot
CS = Close Shot

VIDEO

AUDIO

WEINER: Well, because of lower birth and death rates, the number of older persons is increasing rapidly. At the moment, about 10% of the population of this country is over 65. That's about 21 million people. In 15 years there will probably be about 40 million senior citizens.

Shots as needed HESSBERG: Yes, and as the older population increases, the problems associated with aging will become more visible. I know that most of the research in gerontology has presented a picture of decline and deterioration as a kind of inevitable process. Have you found this to be true?

WEINER: Well, there are losses, but we believe that they are not necessarily inevitable. Perhaps through training techniques certain processes associated with aging can be slowed down or even eliminated.

HESSBERG: Can you give us an example?

WEINER: A psychologist named deVries has shown that 15 minutes of systematic exercise per day for several months increased the physical well-being of a group of men over 70. Most importantly, their oxygen usage capacity increased by 30%. This ability to take in and use oxygen is directly related to good mental functioning.

HESSBERG: That's interesting. But can other problems of aging be helped through psychological techniques?

VIDEO

AUDIO

Shots as needed

WEINER: I think so. But before we can design intervention techniques, we need to know much more about aging processes. That's why I'm so interested in research with older persons.

HESSBERG: Can you tell us something about the type of studies you have been doing?

WEINER: Yes, I have been looking at the ways in which aging affects perceptual discriminations and visual judgments. I've brought along a film clip to show what our studies are like. This clip shows me giving instructions to a subject who then proceeds to do an experimental task.

Fade out

End of common beginning.

Ending #1MODELED SELF-REINFORCEMENT

VIDEO

MS of Model seated at table with Ravens Matrices book open in front of her; point dispenser to her left.

Cut to CS of book, then hold CS on point dispenser five seconds.

Model glances from standard to sample and back--makes a choice and presses lever twice Alternate between MS and CS of Model pressing bar.

Trial #1--Model makes a choice, then presses lever four times

Trial #2--Model makes choice, then shakes head side to side slightly, frowns slightly. No lever press.

Trial #3--Model chooses, smiles, presses lever three times.

Trial #4--Model chooses, smiles, presses four times.

Trial #5--Model chooses, smiles, presses five times.

AUDIO

WEINER: You are about to begin a series of trials at an experimental task. This task involves looking at various patterns, each of which has a missing part. Please try to pick out the proper part which will correctly complete the design. When you think you are correct, you can award yourself points on this automatic device. Is that clear?

MODEL: Yes

WEINER: OK, let's do one for practice

WEINER: That was very good. Now, you may start.

MODEL: I think I'm right.

MODEL: Good for me!

MODEL: Right again. I'm doing well.

VIDEO

AUDIO

Trial #6--Model chooses, smiles,
presses four times.

Trial #7--Model chooses, smiles,
presses four times.

Fade out

END OF ENDING 1

Model has pressed lever total of 24 times, in Trials 1, 3, 4, 5, 6, 7,
and twice in Practice Trial.

NO SELF-REINFORCEMENT--Ending No. 2

VIDEO

AUDIO

MS of Model seated at
table. same as in previous
ending, except point dis-
penser is absent.

Cut to CS of book

MS of model, then alternate
between MS & CS of model
choosing.

Model glances from standard
to sample and back--and
makes a choice by pointing
at one of the stimulus
patterns.

Trial #1--Model makes choice

Trial #2--Model makes choice,
then shakes head slightly side
to side, frowns slightly.

Trial #3--Model chooses, smiles.

Trial #4--Model chooses, smiles. MODEL: Good for me!

Trial #5--Model chooses, smiles. MODEL: Right again. I'm doing well.

Trial #6--Model chooses, smiles.

Trial #7--Model chooses, smiles.

Fade out

END OF ENDING 2

WEINER: You are about to begin a series
(voice of trials at an experimental
over) task. This task involves looking
at various patterns, each of which
has a missing part. Please try
to pick out the proper part
which will correctly complete
the design. Is that clear?

MODEL: Yes.

WEINER: OK, let's do one for practice.

WEINER: That was very good. Now, you
may start.

MODEL: I think I'm right.

APPENDIX B

CONSENT FORM

Agreement to Participate in a Psychological Research Project
Investigating Behavior in Elderly Persons

Principal Investigator: Howard R. Weiner, M.A.,
Department of Psychology,
University of Hawaii, Manoa

Participation in this project will involve procedures which consist, mainly of viewing slides and making judgments about what is seen. In addition, subjects will answer a short personal history and self-evaluation measure. It is expected that the session, which will last for about 30 minutes, will be a pleasant, positive experience for those involved. Each individual will have the opportunity to obtain a small prize. Moreover, knowledge about the behavior of older persons will be increased and potential benefits include the development of techniques and methods which may contribute towards wholesome and meaningful living for older persons.

I certify that I have read and understand the foregoing, that I have been given satisfactory answers to my inquiries concerning project procedures and other matters and that I have been advised that I am free to withdraw my consent and to discontinue participation in the project or activity at any time without prejudice.

I herewith give my consent to participate in this project with the understanding that such consent does not waive any legal right nor does it release the principal investigator or the institution or any employee or agent thereof from liability for negligence or for any wrongful act or conduct.

Signature of Participant

Date

Signature of Witness
(PI or Authorized Representative)

Date

PERSONAL HISTORY

Please answer all questions as best you can. The information will be confidential and used for research purposes only. All individuals will be assigned a confidential code number and no names will ever be used.

S # _____

Name: _____
 Last First Initial

Age: _____ Sex: Male: _____ Female: _____

Place of Birth: _____
 City or Town State Country

Place Where You Have Spent the Greatest Part of Your Life:

_____ City or Town State Country

Years of Education or Schooling: _____

Major Occupation in Life: _____

Marital Status: Single _____ Married _____ Divorced _____
 Separated _____ Widowed _____ Other _____

Current Occupation: _____

What is Your Ethnicity? Please put check next to category that best describes your ethnic background.

American Indian _____ Black _____ Caucasian _____

Chinese _____ Filipino _____ Hawaiian _____ Japanese _____

Korean _____ Puerto Rican _____ Samoan _____ Thai _____

Vietnamese _____ Other _____

S _____

Self-Esteem Form, Part 1

PLEASE ANSWER ALL THE QUESTIONS BELOW. CIRCLE THE ANSWER THAT MOST ACCURATELY DESCRIBES YOUR FEELINGS ABOUT YOURSELF FOR EACH STATEMENT.

I feel that I'm a person of worth, at least on an equal plane with others.

- (4) Strongly agree
- (3) Agree
- (2) Disagree
- (1) Strongly disagree

All in all, I am inclined to feel that I am a failure.

- (1) Strongly agree
- (2) Agree
- (3) Disagree
- (4) Strongly disagree

I am able to do things as well as most other people.

- (4) Strongly agree
- (3) Agree
- (2) Disagree
- (1) Strongly disagree

I certainly feel useless at times.

- (1) Strongly agree
- (2) Agree
- (3) Disagree
- (4) Strongly disagree

I take a positive attitude toward myself.

- (4) Strongly agree
- (3) Agree
- (2) Disagree
- (1) Strongly disagree

Note: The numbers in parentheses indicate the point value of each answer. The higher the score, the higher the self-esteem rating. Highest possible self-esteem score--total of 40 points.

S _____

Self-Esteem Form, Part 2

PLEASE ANSWER ALL THE QUESTIONS BELOW. CIRCLE THE ANSWER THAT MOST ACCURATELY DESCRIBES YOUR FEELINGS ABOUT YOURSELF FOR EACH STATEMENT.

I feel that I have a number of good qualities.

- (4) Strongly agree
- (3) Agree
- (2) Disagree
- (1) Strongly disagree

I feel that I do not have much to be proud of.

- (1) Strongly agree
- (2) Agree
- (3) Disagree
- (4) Strongly disagree

On the whole, I am satisfied with myself.

- (4) Strongly agree
- (3) Agree
- (2) Disagree
- (1) Strongly disagree

I wish I could have more respect for myself.

- (1) Strongly agree
- (2) Agree
- (3) Disagree
- (4) Strongly disagree

At times I think I am no good at all.

- (1) Strongly agree
- (2) Agree
- (3) Disagree
- (4) Strongly disagree

APPENDIX C
VERBATIM PROCEDURAL INSTRUCTIONS GIVEN TO SUBJECTS
IN EXPERIMENTAL SESSION

Feedback Phase

High Positive & Low Positive Feedback Conditions. This task will involve looking at a series of patterns (first training slide shown). Your job will be to judge whether there is more white or more orange in each design. If you think there is more white, please press the button in front of you marked "white"; if you think there is more orange, press the button marked "orange." You will know that you are correct if this light goes on and the chime sounds (pointing to feedback device). Is that clear?

O.K., let's do this one for practice. Tell me verbally first if there is more white or more orange in the pattern on the screen. That's correct. Now press the correct button (feedback device activated). That was very good. Now please try this second one for practice (second training slide projected and instructions and procedure used with first training slide are repeated).

That was fine. Now we are ready to begin. But first, do you have any questions? Is everything clear? OK, the slide projector will start to work automatically in a few seconds. The patterns will come on, one by one, automatically.

As each comes on, you judge whether there is more orange or more white and then press the proper button. Remember, the light and the chime will tell you that you are correct.

(After last slide, to High Positive Feedback subjects)
That was very good. You did better than most persons your age!

(After last slide, to Low Positive Feedback subjects)
That was fine. You did as well as most persons your age.

No Feedback Condition. This task will involve looking at a series of patterns (first training slide shown). Your job will be to judge whether there is more white or more orange in each design. If you think there is more white, please press the button in front of you marked "white"; if you think there is more orange, press the button marked "orange." Is that clear?

O.K., let's do this one for practice. Tell me verbally first if there is more white or more orange in the pattern on the screen. That's correct. Now press the correct button. That was very good. Now please try this second one for practice (second training slide projected and instructions and procedure used with first training slide are repeated).

That was fine. Now we are ready to begin. But first, do you have any questions? Is everything clear? O.K., the slide projector will start to work automatically in a few

seconds. The patterns will come on, one by one, automatically. As each comes on, you judge whether there is more orange or more white and then press the proper button.

(after the last slide, experimenter reappears and gives instructions for next phase).

Modeling Phase

It will be a few minutes until I'm ready for you to start the next part. Why don't you sit here (indicating chair) and watch this short videotape. It shows me being interviewed on one of those talk shows, and talking about my research with older persons. I think you will find it interesting. So just sit here and relax and watch it, and I'll let you know when I'm ready for you. Can you see the TV all right, and hear it? O.K., enjoy.

Matching to Sample Phase

See this knob (pointing), by turning it you can make that circle of light on the screen get bigger or smaller. Watch me do it (demonstrating). Now you try it. Turn the knob slowly to the left and see the circle get smaller, now turn it to the right to make it bigger. Your next task will involve matching the size of that circle (pointing) to be the same size as circles which will be projected on the screen, one at a time. (First training slide projected) Now, you adjust the size of your circle, on the left, to be the same size as that circle on the right. Go ahead, try it. That

was very good. Each time you think you have correctly matched the circle size, you can award yourself points on this automatic point dispenser. Each press of this lever gives you one point. The points are added up here on this counter. You can award yourself as many or as few points as you want for each successful match. Later on you can exchange your points for one of these prizes (pointing to back-up reinforcers).

O.K., let's do another one for practice. There's the projected circle (second training slide), now you try to match it. All right, if you think you matched it correctly, you can award yourself points. Press the handle as many times as you wish. Remember, you can give yourself as many or as few points as you want for each successful match.

Do you have any questions? Is everything clear? All right, the slide projector will start to work automatically in a few seconds. As each circle comes on, you try to match it in size. Remember, if you think you matched correctly, you can give yourself points.

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