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Training Self-Control in Food Selection through Verbal Self-Instruction

Thomas Vincent O’Melia
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TRAINING SELF-CONTROL
IN FOOD SELECTION THROUGH
VERBAL SELF-INSTRUCTION

by

Thomas Vincent O'Melia

A Thesis
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
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TRAINING SELF-CONTROL IN FOOD SELECTION THROUGH VERBAL SELF-INSTRUCTION

Thomas Vincent O'Melia, M.A.
Western Michigan University, 1982

This project was designed to teach children self-control through verbal self-instruction and self-reinforcement procedures prior to snack time in order to determine if they would learn to choose more nutritious foods during that period. Food facts and related health information were taught by the use of fictitious stories. In the experimental classroom the children heard stories, approximately 3 to 5 minutes long, that emphasised food facts and related health effects. After the stories, the children were allowed to go to a snack bar to select from "good and bad" foods. A set of questions and information was rehearsed prior to selection. This tutoring, (based on a verbal self-instruction procedure) followed the DISTAR training methods. The results of the study showed that storytelling increased nutritious food selection and verbal self-instruction training facilitated self-control.
ACKNOWLEDGEMENTS

This study was funded in part by a Federal Research Grant (NICH-HD #R01-HD13170) award to Dr. Joetta Long. My most sincere appreciation is given to Dr. Neil Kent for his advice. Special thanks must also be given to Keith Walker for his dedicated assistance as research aide and Susan Dickerman for advice and editing.

Thomas Vincent O'Melia
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CHAPTER I

INTRODUCTION

There are at least three distinct components to self-control training: self-evaluation, time delay and verbal self-instruction. With rigorous covert measurement/assessment methods (Kendall & Hollon, 1981) and the conceptualization of converting overt behaviors to covert behaviors (Kanfer & Karoly, 1972) self-control procedures and learning processes can be empirically studied. Recent studies show self-control procedures used successfully in the reduction of smoking behavior (Newman & Bloom, 1981), in weight loss maintenance (Cohen, Gelfand, Dodd, Jensen & Turner, 1980), in increasing resistance to temptation (Hartig & Kanfer, 1973), in training coping skills (Barrios & Shigetomi, 1979; Kendall & Zupon, 1981) and in training families and teachers in effective child control procedures (Glenwick & Barocus, 1979; Denicola & Sandler, 1980).

A study by Wood and Flynn (1978) compared an external token system to a self-evaluation token system. Six predelinquent male youths placed in Florida state agencies, aged 13 to 15, participated in a token economy in which room cleaning was either externally evaluated
by contingency managers or self-evaluated. Self-evaluation ratings were matched to observer-evaluations with points contingent upon agreement. After reaching an 80% accuracy criteria tokens were determined solely by the youths' ratings. Using a random inspection accuracy check procedure the youths lost accuracy points for self-ratings below 80% accurate. This study employed a well designed faded checking procedure to eliminate external control and provide accurate self-control. Results showed that during the external token condition, room cleanliness increased to an average 12.0 items correct, but after termination, the average fell to 6.8 items correct within 10 days. Self-evaluation increased to 13.0 items correct and fell to only 11.4 after 10 days. Self-evaluation was shown as an effective method in increasing and maintaining room cleaning behavior for all youths participating in this study.

The second approach to self-control is through delay of gratification or time delay. In delay of gratification studies, self-control is facilitated using exposure to (1) live models (Bandura & Mischel, 1965), (2) increased time delay of reward (Newman & Bloom, 1980 a), (3) time delay with cue salience and active rehearsal (Newman & Bloom, 1980 b), (4) symbolic rewards presented during time delay (Mischel & Moore, 1973;
Mischel, 1974), and (5) thinking "fun things" during the delay period (Mischel, Ebbesen & Zeiss, 1972).

Children presented with either live or symbolic models differed substantially in post exposure delay behavior when compared to a control group (Bandura, 1965). Children in the live model group watched as models delayed playing with toys that had been placed directly in front of them. After exposure to the models the children were presented with the toys and told not to play with them. This group showed modeling delayed play behavior was an important factor in increasing children's ability to delay reward. One problem with this study is that it did not account for effectiveness of time delay increments as a means of shaping self-control.

Newman and Bloom (1981 a) conjectured that smoking behavior is a problem of self-control. They stated that self-control in smoking behavior is an instance of a response deficit and not a response absence. That is, smoking inhibition is aversive during time delay increments; the ability to delay exists but needs to be shaped. In addition, it is suggested that smoking inhibition be practiced in settings where the person normally smokes. The research was performed with 30 male and 30 female undergraduate student volunteers who had smoked.
a minimum of one and a half packs per day for over a year. Each subject was taken to an experimental room, sat in a chair, told to light a cigarette, place it in an ashtray and take a puff whenever they wanted. Participants were asked to delay as long as possible to allow for physiological data to be obtained. In the treatment phase, participants were instructed when to take a puff and only one puff after a certain amount of time had elapsed. Delays were increased 10 seconds every trial up to 300 seconds in the final trial. An F-test revealed that subjects delayed significantly longer in the increasing delay group but not in either the decreasing or random delay groups. The major finding reported is that imposed exposure to increasing delay improved subjects' tolerance to smoking inhibition.

The second study by Newman and Bloom (1981 b) studied the influence of increased temptation cue salience and decreased degree of external control on increasing delay to facilitate self-control. Forty male and forty female participants followed a procedure similar to the above except that the cigarettes were either hidden or in view. In the external control condition the experimenter handed the cigarette to the participant while in the self-imposed condition the experimenter told the participant to smoke. Self-imposed
delay condition participants were instructed to take a puff whenever they wanted. An analysis of variance on residual change scores indicated that both self-imposed delay and cue salience training resulted in longer delays. A significant decline occurred in the galvanic skin response (GSR) in the cue salience condition. These findings suggest that rehearsal in the presence of the tempting stimuli are more effective with self-imposed delays.

In self-evaluation the essentials for self-control appear to be self-monitoring and reward with faded external checking. The time delay approach shows that sequential time delays, cue salience, and self-imposed delays facilitated smoking inhibition without the aversiveness associated with delay of reinforcement. Mischel and Moore (1973) studied the influence of symbolically presented rewards upon self-control during delay periods. The purpose of this study was to demonstrate the effect of preferred attentional strategies, either to the actual food rewards or to the contingent symbolic rewards on delay of gratification. In all conditions relevant imagery presentation produced the longest delay time; either exposure to actual rewards or instruction to imaging these rewards interfered drastically with delay time.
In an earlier study on delay of gratification Mischel, Ebbesen and Zeiss (1972) investigated means of facilitating self-control with 50 children, ages 3 1/2 to 5 1/2, while faced with immediate less preferred or delayed preferred food rewards. Results revealed that delay time was extremely low (1/2 minute) when the children had no distraction stimuli available to reduce frustration. Significant results were found when children were either instructed to "think fun" things or presented with overt distractors. The results showed a mean delay time of 14.48 minutes for the "think fun" condition and 12.86 for the no instruction condition. The control group waited .78 minutes when instructed to think about the food reward. In summary, "fun stimuli" presented during the delay time, whether relevant or irrelevant to the food reward, facilitated children's self-control.

Investigation of findings to this point are that self-imposed delay of reward depends on a person avoiding stimuli associated with delay aversiveness, and that self-imposed delay marks self-control (Mischel & Ebbesen, 1974). Mischel and Ebbesen answered their 1970 study hypothesis that children need to focus attention on other behaviors, covering eyes, resting head on hands, etc., while not attending to the reward objects and any activity that can be substituted for delay should subse-
quently reduce aversiveness.

Whether delay time is self-imposed or externally imposed appears to be insignificant on delay time (Yates & Mischel, 1979). Results in this experiment with both preschoolers and older children showed children delayed equally long periods of time regardless of external or self-imposed delay. Younger children preferred exposure to real stimuli, regardless of relevance, to the actual delayed rewards while older children preferred irrelevant stimuli presented during the time delay. Yates and Mischel reported irrelevant stimuli reduced attentiveness toward and aversiveness of delayed rewards.

As the present study delays snack eating time, it is deemed essential to investigate previous research findings which present methods that facilitate self-control during presentation. Dunker (1938) used social suggestions presented in story form to influence children's food preference. Each day during the 12 day testing procedure the children heard stories about story heroes who ate good foods. As early as the Dunker study, it was reported that children's food preference could be influenced through social modeling.

Bohannon and Friedlander (1973) showed that in presentation methods for story effectiveness with children "meaningfulness alone doesn't constitute a
good basis for language meaning and understanding."
This study with primary school children investigated the effects of intonation on syntax recognition as a variable to increase the children's understanding on meaning. Results indicated children were not good listeners. Mode of presentation (i.e., live, television, audio tape) was shown to have significantly different modeling effects with elementary grade children (Wetstone & Friedlander, 1974). When these children participants were exposed to stories read by a teacher via live, television or audio tape modes of presentation, listening comprehension was more significantly influenced for the video presentations.

Wolf (1973) measured the influence television has on children's verbal and task behaviors which replicate resistance to deviation as modeled by the televised presentation. Verbal modeling cues were shown to qualitatively differ in terms of informational cues transmitted. Participants differed in the extent to which cues translated into behavioral enactments. In brief, children's active rehearsal and participation in modeled tasks increased resistance to deviation informational verbalizations. Delay of reward studies showed self-control increased when frustration reducing "fun stimuli" were presented during the delay time.
Studies on mode of presentation showed that children attend more to televised modes of presentation measured by increased verbalization when paired with active rehearsal. Stories presented via live models can be effective in increasing self-control when presented during the delay period and when children have the opportunity to actively participate in the modeled behavior.

In a study on the design of stories for teaching procedures Rileigh (1973) showed that kindergarden children have an attention span of approximately 156 seconds (3 minutes) to stories with natural syntax and good intonation. Kindergardeners did not have the ability to distinguish between story versions and all children listened to superficial aspects of stories. Engelmann (1980) conceptualized that there are several procedures in the instruction model that are essential for teaching children. The following basic rules of instruction were outlined by Engelmann: a) the story should show sameness/difference with a wide range of examples; b) the story should use as few of these examples as possible to teach the greatest possible shared features; c) the story needs to label examples in the same manner; d) differences need to range from minimal to maximal; and e) the story should provide examples to test the children's
knowledge of the difference.

The third approach to self-control is verbal self-instruction procedures. In verbal self-instruction the trainer teaches the individual a verbal response repertoire which guides the individual through a task behavior, followed by shaping verbal self-reinforcement for correct behavior. Simply, this process is one of internal cuing, instructing and reinforcement. Cuing and self-instruction must be self-imposed prior to or in conjunction with performance. This is referred to as a correspondence by other investigators (Risley & Hart, 1968). These investigators demonstrated that if a teacher rewarded a child for a desired verbalization only if it accurately reflected a previous play behavior, a correspondence developed between what the child did and what the child said with the desired outcome being that the child began to make the desired actions more often. Repeated reinforcement of the verbal behavior was sufficient to maintain the non-verbal behavior.

Israel (1978) investigated the inverse of this procedure, "say-do" correspondence. Similar to the present study, Israel's study on correspondence suggests that a say-do paradigm is superior to a do-say paradigm. For one reason, in the do-say paradigm, children continued to add a non-verbal response, as giving a toy to another
child, following the do-say correspondence actually making it a do-say-do paradigm. Maintenance of behavior is said to be enhanced because of the absence of external cues. Generalization via control of non-verbal behaviors is more evident.

Verbal self-instruction training was predominately defined by Bem (1967). In a termination of task behavior study with children having low pretest performances, Bem indicated the low pretest scores are due to an absence of verbal self-control. Bem showed that a child trained to respond to self cues is able to control their own behavior through self-generated cues which are experimentally established. When external cues were faded, control shifted to internal stimuli. This deficiency approach was further investigated by Miechenbaum and Goodman (1971) in establishing a training procedure for impulsive children. Impulsive children, described as either hyperactive, poor self-control, or behavior problems, were given a set of instructions and a model to follow through a repetitive task. The verbal self-instruction group received trials with external instructions which were faded as the child reached criteria. The fading procedure allowed for covert measurements through observation of "other" overt behaviors that signified "thinking". Self-guidance mediated control
of non-verbal behavior. Cognitive modeling plus self-instruction groups were most effective in altering decision time and reducing task errors. Self-instruction was shown to bring impulsive children's overt behavior under their own verbal discriminative control.

The self-instructional training procedure (Meichenbaum, 1975) was administered on an individual basis and proceeded as follows: a) the child observed a self-verb-alizing model perform a task (such as a finger maze task); b) the child performed the same task while following the verbal instructions of the model; c) the child was then instructed to talk aloud while doing the task, approximating the model's verbalizations; d) the child was instructed to employ covert self-instructions; and e) the child went through a final stage to consolidate the internalization process. The verbalizations that the therapist modeled and the child subsequently used included: a) questions about the nature of the task; b) answers to these questions in the form of cognitive rehearsal and planning; c) self-instruction in the form of self-guidance; d) instruction on coping with frustration and failure; and e) self-reinforcement. In this way, impulsive children develop a new cognitive approach (learning set) in which they can size up, cognitively rehearse, guide their performance by means of self-
instructions, and finally appropriately reinforce themself.

The self-instructional training procedure follows a similar sequence with the fading of verbalizations as task proficiency increases. Thorensen and Mahonev (1974) found that in self-instructional procedures, it is important to insure that the child does not say the self-statements in a relatively mechanical, rote, or automatic fashion without accompanying meaning and rehearsal. The acquisition experiment can be individually tailored to the needs of each child with some children requiring many trials of modeling and overt self-instructional rehearsal. Effective covert self-control methods require careful environmental planning so the trainee learns self-management by means of observation, practice and performance feedback (Thorensen & Mahoney, 1974).

Friedling and O'Leary (1979) trained groups of hyperactive children in both academic and on-task behaviors through self-instructional procedures. The self-instructional group followed the Meichenbaum (1975) procedure while the control group was exposed to the same situation without the self-instruction training. Children in the self-instructional group improved accuracy in easy math, but no improvements were found in hard math, comprehension or on-task behaviors which were
relative to the experimental procedure. As a result of this failure to replicate results, these experimenters performed a two-part study to compare the self-instruction procedure to a token reward procedure. Tokens were found to increase on-task behavior but were not effective on academic measures, while child emitted verbal-evaluations decreased. In conclusion self-instruction is regarded as having greater utility in improving mastered skills not optimally performed. Secondly, from the results of this study, verbal self-instruction appears an effective teaching method for the present study in teaching food facts.

An instructional package used in teaching pedestrian safety skills to younger children was similar to a self-instructional procedure (Yeaton & Bailey, 1978). Children were taken to a street intersection, adjacent to the experimental school, and trained in safety crossing skills. The four phase procedure included: (1) tell them; (2) show them; (3) ask them; and (4) let them. The first phase was an instructional procedure, the second, third and fourth phases were designed to teach self-instruction with active rehearsal. The procedure was successful in producing 95% correct behaviors immediately and reached 100% in day three. A one year follow-up showed 79% correct behavior; still significant.
above the 40% baseline. Another major significant finding of this study was generalization of the training procedure. In this study a second street crossing site was used as the generalization street. Data obtained for the generalization street were 72% correct behavior post study and an increase to 87% at follow-up. Instructional procedures in which a child learns to self-generate cues, verbal instructions and self-reinforcements have greater generalizations across situations and maintenance of behaviors which are shown to improve with time (Yeaton & Bailey, 1978).

The greater effectiveness of internal control over external control procedures is predominant in generalization and maintenance as shown in other studies. In smoking reduction studies, Berstein (1969) compared a variety of techniques all of which showed increases in smoking at follow-up. Berstein contributes the short-term effectiveness of those procedures to external control components of the techniques. External controls are apparently more powerful in producing immediate effects on behavior when compared to internally induced criteria (Sagotsky & Patterson, 1978). Wood and Flynn (1978) report that room cleaning behavior rapidly returned to near baseline when external reinforcers were withdrawn. These investigators similarly concluded that
externally presented tokens were more effective, but when paired with self-evaluation and reinforcement contingencies, children maintained an appropriate level of room cleaning behavior long after external tokens were terminated. It appears that children learned to accurately report their own behavior (Wood & Flynn, 1978).

Self-reinforcements are any of a large supply of tangible reinforcers readily available to a person. Self-approval and praise are examples of reinforcers a person can deliver when performance criteria is reached or exceeded (Bandura, 1976). In self-reinforcement, a person is trained first to accurately evaluate their own performance and secondly to dispense appropriate degrees of self-reinforcement for attaining performance criteria (Wood & Flynn, 1978). Burron and Bucher (1978) showed a history of reinforcement for following self-instructions facilitated future successful implementation of the procedures to generalized other performances. Sawin and Parke (1979) showed that children could resist temptation if "instructing themselves to do so, but could not resist if instructing themselves to work on the task" (p. 125). Ability in self-instruction is described as a differential learning history of prohibitive and task directed behavior shown to facilitate or disrupt self-
control (Sawin & Parke, 1979).

The Hoedl (1981) study compared individual verbal trained to group verbal trained preschool children on corresponding snack selection with external versus group-peer reinforcement. Group verbal training was shown more effective and less time consuming in shaping verbal cues directing corresponding behavior of good food selection. No other experimentally produced behavior changes were maintained after termination of reinforcement procedures. The procedure used in the study was the direct verbal instructional model. In direct instruction children are instructed to say what they are going to do, through a prompted question and reply format, similar to Israel's (1978) "say-do" correspondence procedure. A second conclusion of the study was that the effects of external contingencies were short lived effects and natural reinforcers of the "junk" food nullified verbal instruction results.

This procedure differs slightly from Michenbaum's self-instructional procedure in that fading to covert and the emphasis on verbal self-reinforcement are not included. Still, the effectiveness of direct instructional procedure has been shown to be highly successful as an educational intervention (Becker & Carnine, 1980). In this study a comparison was made of three basic
educational philosophies. These philosophies included:
a) three models of subjective theories from Piaget, 
Freud and Dewey; b) two models oriented directly to 
student skill development with behavioral procedures;
and c) two educational models. The direct instructional 
model, oriented to student skill development, sponsored 
by the University of Oregon from the works of Becker 
emphasising use of small-group, face to face, instruc-
tion by teachers, with carefully sequenced lessons was 
proven to be the most successful. This program goes 
under the trade name DISTAR. The program study showed 
that the direct instructional method is more effective 
in establishing improvements in academic, cognitive-
conceptual and affective measures.

In summary, the present study is designed to train 
children in self-control skills for frequenting nutritious 
food selection at snack time. This is a preventive 
approach to good health and reduced dental problems. 
The study follows a three phase preventative approach 
to good health and reduced dental problems. The first 
phase is a training procedure to teach food facts through 
story presentations. Stories have been shown to be a 
viable means of teaching health and nutrition if the 
stories are "fun", and will hold the child's attention 
for a short 3 to 5 minute period. "Fun" stimuli presented
during the delay period are shown to reduce the aversiveness associated with delay of snacks. Secondly, self-control training through direct instruction, following Meichenbaum's verbal self-instruction procedure should facilitate good food selection skills during active rehearsal. Information learned through the stories will be applicable for answering questions during verbal self-instruction. Third, a carefully planned fading and checking procedure should shift external control to internal self-control.
CHAPTER II

METHOD

Subjects

The study was conducted at the Child Development Center which is a day care and kindergarten school for children ages 2 1/2 to school age. A class of preschool children registered for full or half days, and present for afternoon snacks, was selected to participate. The class consisted of 6 boys and 7 girls age 3 to 4 years old. Consent forms were signed by parents and all children were asked and agreed to participate in the study. A second essential function of the consent forms was to obtain information on individual child allergies to particular snack foods.

Setting

A classroom 30 x 40 feet located across the hall from the kitchen was set up for the study. The classroom was arranged so that the right front portion of the room was carpeted and the children upon entering the room could sit in the carpeted area before snacks. A wall divider of cabinets separated the carpeted area from the right rear snack bar area. The snack bar was a
table set up with two chairs for the experimenters. A second table located in the rear left area of the room, across from the snack bar, was arranged for the children to sit and eat. Neither the snack bar nor the dining table could be seen from the carpeted area.

Procedure

Measurement Procedures

As this was a study in self-control, a wide variety of snack foods were presented to the children to determine self-control. Each afternoon six snack choices were available consisting of three good foods and three bad foods (see Table I). The snack were presented in mixed order on separate dishes placed in two rows of three dishes. The children were called to the snack bar in order, one at a time, starting with the first child listed the first day. This child would be second on the second day and so on. This gave each child a chance at being first and at being last. Only one child was allowed at the snack bar to avoid peer modeling in food choice and answering questions. When the children arrived at the snack bar, they were asked several questions about food. The questions were:

(1) "Name the bad foods?", (2) "Name the good foods?",
(3) "Now you can choose your snacks." The control
<table>
<thead>
<tr>
<th>DAY</th>
<th>BAD FOOD</th>
<th>AMOUNT</th>
<th>GOOD FOOD</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>MON</td>
<td>Twinky</td>
<td>1/2 cake</td>
<td>Bananas</td>
<td>3-1&quot; chunks</td>
</tr>
<tr>
<td></td>
<td>Pretzel</td>
<td>3 each</td>
<td>Tomato</td>
<td>2-1/4 or; 3 Cherry</td>
</tr>
<tr>
<td></td>
<td>Candy</td>
<td>3 pieces</td>
<td>Peanuts</td>
<td>1 ounce</td>
</tr>
<tr>
<td></td>
<td>Alter:</td>
<td></td>
<td>Alter:</td>
<td></td>
</tr>
<tr>
<td>TUES</td>
<td>Hostess</td>
<td>1/2 cake</td>
<td>Apples</td>
<td>2-1/4 slices</td>
</tr>
<tr>
<td></td>
<td>Choc. Cupcake</td>
<td>3 each</td>
<td>Celery</td>
<td>3-long slices</td>
</tr>
<tr>
<td></td>
<td>Cheese Nips</td>
<td>3 pieces</td>
<td>Granola</td>
<td>1/2 bar</td>
</tr>
<tr>
<td></td>
<td>Candy</td>
<td>Alter:</td>
<td>Alter:</td>
<td></td>
</tr>
<tr>
<td>WED</td>
<td>Cookies</td>
<td>2 each</td>
<td>Grapes</td>
<td>6 each (whole)</td>
</tr>
<tr>
<td></td>
<td>Goldfish Crackers</td>
<td>6 each</td>
<td>Tomato</td>
<td>2-1/4 or; 3 Cherry</td>
</tr>
<tr>
<td></td>
<td>Candy</td>
<td>3 pieces</td>
<td>Carrots</td>
<td>3-1/4 long slices</td>
</tr>
<tr>
<td></td>
<td>Alter:</td>
<td></td>
<td>Alter:</td>
<td></td>
</tr>
<tr>
<td>THURS</td>
<td>Twinky</td>
<td>1/2 cake</td>
<td>Orange</td>
<td>2-1/4 slices</td>
</tr>
<tr>
<td></td>
<td>Saltine</td>
<td>3 each</td>
<td>Celery</td>
<td>3-long slices</td>
</tr>
<tr>
<td></td>
<td>Candy</td>
<td>3 pieces</td>
<td>Cheese</td>
<td>3-small slices</td>
</tr>
<tr>
<td></td>
<td>Alter:</td>
<td></td>
<td>Alter:</td>
<td></td>
</tr>
<tr>
<td>FRI</td>
<td>Cookies</td>
<td>2 each</td>
<td>Apple</td>
<td>2-1/4 slices</td>
</tr>
<tr>
<td></td>
<td>Cheese</td>
<td>3 each</td>
<td>Orange</td>
<td>2-1/4 slices</td>
</tr>
<tr>
<td></td>
<td>Nips</td>
<td></td>
<td>Carrots</td>
<td>3-1/4 long slices</td>
</tr>
<tr>
<td></td>
<td>Candy</td>
<td>3 piece</td>
<td>Alter:</td>
<td></td>
</tr>
</tbody>
</table>

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group was simply given the food choice.

As each child ordered snacks one experimenter served the food proportionately while a second experimenter recorded food preferences. The child went to the dining table after receiving snacks. Serving time was approximately 15 minutes. This was the length of time the last child waited before being served. This provided for a time delay. In the control group, the serving time required only several minutes.

After everyone received firsts, the children returned to the snack bar with their dishes allowing the experimenter to record amounts eaten. Children could then select a second serving. Children did not have to select seconds nor did they have to sit at the table after eating. The experimenter only asked the child, "What would you like". Selection sequence was again recorded. Seconds are recorded as both a measure of generalization and a measure of applied self-control.

The measureable characteristics of self-control include amounts of good and bad foods eaten, generalization to second servings, and maintenance of behavior. The first experimenter asked the child questions and served the snacks to the child. The second experimenter recorded, in numerical order, the sequence in which the child asked for the foods. When the child finished, the
first experimenter would again ask questions on which food the child ate while the second experimenter recorded the amounts eaten by thirds (if three slices of a fruit were served, and two pieces eaten, the experimenter recorded the two-thirds.) The thirds rating was used because the portions were small, proportioned and could quickly be visually inspected for amount eaten. For accuracy checks, two experimenters occasionally rated and recorded data. All mistakes were quickly discovered and corrected.

**Experimental Design**

The experimental group followed through three conditions of training: baseline I, story telling on food health facts, baseline II, and verbal self-instruction (VSI)/reinforcement. A within-subject design is used as a comparison between subjects in obtaining goals of self-control in each condition. In baseline I, a beginning measure for comparisons of food preference was obtained. During the story telling condition, the effects of the stories on selection was measured, and in the final self-control training condition, the effects of VSI and self-reinforcement on self-control are obtained. This design gives the results of a multiple comparison design.
The control group provides a measure of between subjects design, and additionally rules out extraneous variables. The comparison between groups gives the advantage of demonstrating the degree of selection over time due to exposure to the various foods.

Experimental Conditions

Baseline I

The baseline I condition was a three week period in which no treatment was provided. Data were obtained on food preferences of children prior to training. During baseline I the children, in groups, entered the snack room and were seated in the carpeted area. After they were seated the experimenter started calling the children to the snack bar. Children were asked to name the foods and then allowed to eat at the dining table. Children were corrected on names of foods. Second servings were similarly distributed.

Story Telling

In the second phase of training, the children in the experimental condition were told stories about various cartoon and real life characters who ate bad and good foods. The stories emphasised health and food facts pertinent to eating such foods. Stories were designed to
teach the children facts on nutrition. Each story incorporated sets of questions to be sure each child learned the correct facts. Each story was prepared and tested in the preliminary study. On the average, stories ran three to five minutes. Children's attention and quietness contributed to the length of story time. The story phase continued for 2 weeks. At the completion of each story the same procedure as in baseline I was used to call each child to the snack bar.

**Baseline II**

This 2 week phase was conducted with the same procedure used in baseline I. The baseline II conditions were needed to measure the effectiveness of story telling and maintenance of food selection behaviors due to treatment.

**Self-Control**

Implementation of verbal self-instruction and self-reinforcement procedures started on day 36, the start of the fifth week. This phase was cumulative to all other procedures except that stories on nutrition were eliminated the last week. When children were called to the snack bar the following set of questions were asked:
Questions: Answers:
1. Name the bad foods? 1. Names the three bad foods at the snack bar. Experimenter corrects answers.
2. What happened to ____ when he/she ate bad foods? 2. He/She was slow and fat and dumb. Other possible answers.
3. What will happen to you? 3. I will be slow and fat and dumb, etc.
5. What happened to ____ when he/she ate good foods? 5. He/She was smart and fast and etc.
6. What will happen to you? 6. I will be smart and fast and etc.

The experimenter filled in the blanks with the name of the daily story heros. Questions were asked quickly to save time and answers sped-up with prompts to avoid errors. After answering questions he/she was asked what foods he/she wanted. Each time a good food was choosen, the experimenter told the child "That's good! You tell yourself outloud 'Good! I picked the good food!'"
The child was required to repeat the statement.

After eating firsts, the child returned to the snack bar and amounts eaten were recorded. Next the child was asked: "What would you like for seconds?" Selection sequence was again recorded. The amounts of good and
bad foods eaten for seconds similarly were recorded. No
questions were asked and no self-praise was requested
on seconds as a test of generalization.

Fading of response cues for selection was incorpor­
ated within this phase of training. During fading
several steps were taken. First, after each child
could answer immediately and correctly, he/she was told
to "think" the answers (covert verbal self-instructions).
As each question was asked, the child hence "thought"
the answer. Overt behaviors such as eye movement, face
musculature movement and head and arm movements were
used as evidence that the child was thinking the
answers. These physical responses are similar to the
physical movements present during overt responding and
are therefore representative of covert speech.

Secondly, questions were faded. In this procedure,
"x"'s were placed by the childs name each time improve­
ments in percentages were recorded. With 1 "x", 3 of
the above questions were asked, with 2 "x"'s, 2 questions
were asked and with 3 "x"'s the child was told "think
about all the answers before choosing your snacks."
Similarly, self-reinforcement cues were faded and
measured through smiles and other physical gestures.
CHAPTER III

RESULTS

Figures 1, 2, 3, & 4 show the percentages of nutritious foods eaten for first and second servings across the four experimental conditions. Percentages of nutritious foods eaten were calculated by dividing the amount of nutritious food eaten by the total amount eaten.

During baseline I a 15 day recording period was used to gather information on individuals' selection and eating behaviors. The 15 day baseline was required because of the large fluctuations observed in food selection and eating behaviors. Baseline I data showed the mean amount of nutritious food eaten as 29.99% for the experimental group and 30.11% for the control group. The control group ate only 5.7% nutritious foods for seconds while the experimental group showed no difference. Food selection and food eaten were observed to be consistent with all children eating approximately 95% of selected snacks.

The results for the second condition, story telling to facilitate self-control, showed 8 of the 11 children in the experimental group eating 100% nutritious food by the end of the second week. The mean percentages of
Figure 1. Percentages of nutritious foods eaten by children 1, 2, & 3 in the experimental group across conditions.
Figure 2. Percentages of nutritious foods eaten by children 4, 5, & 6 in the experimental group across conditions.
Figure 3. Percentages of nutritious foods eaten by children 7, 8, & 9 in the experimental group across conditions.
Figure 4. Percentages of nutritious foods eaten by children 10 & 11 in the experimental group across conditions.
nutritious foods eaten increased to 56.83% for firsts and to 43.16% for seconds. A reversal to baseline I conditions, shown in baseline II, revealed the behavior was not maintained as 5 of the 8 improved children showed decreased percentages of nutritious food eaten. The baseline II percentages were lower then previously recorded in baseline I. Of the 3 improved children 2 continued to eat 100% good foods. The mean for firsts, 54.03% nutritious foods eaten, did not change compared to the story condition, while the mean for seconds decreased to 29.58% as in baseline I. The decrease in seconds was influenced by the fact that only 1 of the 3 maintainers selected a second serving during baseline II eating 33% nutritious food.

The verbal self-instruction (VSI) training results showed that self-control was facilitated for 10 of the 11 children. Five of these 10 children were eating 100% nutritious foods for firsts and seconds. Two children were eating 100% nutritious food for firsts and 0% for seconds. During the last week of training 3 children were occasionally selecting 100% good food. Fading of experimenter questions and required verbal responses was initiated individually as children reached 100% nutritious food selection. Figures 1, 2, 3, & 4 show self-control was facilitated as the selection and
eating behaviors for 7 children were maintained at 100% after fading procedures were discontinued. The mean percentage of nutritious foods eaten increased to 76.78% for firsts and to 56.58% for seconds. For the control group, the post-study mean percentage of nutritious foods eaten was 28.27% for firsts and 27% for seconds. Pre-measure post-measure control group comparisons show no difference in selection due to maturational and historical variables.
CHAPTER IV

DISCUSSION

Results in Figures 1, 2, 3, & 4 showed that children learned self-control when trained to verbally instruct themselves to select nutritious foods. Several other studies similarly concluded that verbal self-instruction training facilitated self-control (Bem, 1967; Meichenbaum, 1975; Friedling & O'Leary, 1979). When given the choice to select between three nutritious snack foods and three junk foods, the percentages of nutritious foods eaten increased as seen in 10 of the children. During VSI the experimenter prompted the children to answer questions about eating good and bad foods. These food facts were presented in the stories before snacks. Children were assisted in giving correct answers. The emphasised advantage of self-control training is in both the self produced cues and the self rewards for accurate responding. As the experimenter's cueing is gradually eliminated the child's self-cueing becomes more dominant in the presence of the wide selection of snack foods. In other words, the learned internal cueing and rewarding skills are achieved through the fading of the external
experimenter prompted questions. Self-control skills can additionally be applied as a preventive approach to health problems that occur later in life.

Maintenance, shown through continued selection of nutritious foods during VSI, is the result of verbal self-reinforcement accurately dispensed for nutritious food selection. The experimenter did not reinforce nutritious food selection. Self-reinforcement is essential because, as shown in other studies, internal rewards have a long lasting effect on behavior, whereas, studies on the effect of external rewards show that behavior diminishes when the rewards are no longer available (Wood & Flynn, 1978). Children who accurately reinforced themselves showed higher percentages of nutritious food selection when they applied self-instructions.

Generalization, in selection and eating behaviors, was slower to develop as seen in the differences in percentages for firsts and seconds and in the group means. These results were found in both training conditions and in baseline II. In another study results showed generalization continued to improve long after training (Yeaton & Bailey, 1978).

Story telling alone did not facilitate self-control but rather had the effect of teaching information on
nutrition, types of nutritious foods and health related effects. Figures 1, 2, 3, & 4 showed that during the story telling condition the story effects prompted good food selection. These increased percentages did not last during baseline II when stories were discontinued.

During baseline II time delay was continued but showed no effect in facilitating self-control. Baseline II results showed the children who improved during the story condition decreased to levels lower than baseline I. For this reason time delay cannot be considered as a variable in producing the selection behavior. The percentages for John and Krista however were maintained at 100% for both firsts and seconds. A longer baseline II would be needed to determine whether these children would continue to select high percentages of nutritious foods. One variable that could account for the maintenance of behavior in these two children is the self-reinforcing statements they began making during story telling. These statements included "I'm smart cause I got good food to eat" and "you got bad food, I got the good food." Burron and Bucher (1978) stated that a history of accurate self-evaluative behaviors will determine acquisition rate of future self-control. In conclusion, a combination of history, time delay, self-evaluation and self-reinforcement
could account for the acquisition of self-control in these 2 children.

Story presentations of food and health facts were included within the story telling condition. The high percentages of nutritious foods eaten indicate that story presentation and story characters are variables that influenced selection and eating behavior. Stories, pretested in the preliminary study, showed that improved children were attentive during story telling and talked about the stories at the dining table.

It should be noted that only 3 children did not attain high percentages of nutritious foods eaten. Kristina and Renee were observed to be quiet children who named on the average only 2 of the available snack foods and only pointed to the other foods. During VSI they rarely answered questions and did not talk with the other children. Dave did not attend to either the stories or the instructions as evidenced by his wrong answers and not knowing who the story heros were. He was a very active child who was always running, sliding or watching other activities in the room. For these 3 children, there were few opportunities for self-evaluation as the reinforcing value of the junk food was greater than the self-reinforcements.

The main objective of this study was to determine
whether younger children could learn to control their eating behaviors. When the children were presented with an open snack bar and given a chance to select whatever they wanted, children showed no self-control as shown in their selecting all the junk foods and few good foods. Through the use of stories on food facts and verbal self-instructions the children's behavior was modified using only experimenter prompts. The procedure, when conducted in small groups, can be considered time and cost efficient requiring, on the average, only 45 minutes per session for several weeks to conduct. For this reason it would be recommended that the procedure be tested using only the story plus VSI condition. In both the story telling condition and the VSI condition the children were presented stories on food facts, story models and the opportunity to actively rehearse good food selection. The carry over effects from story telling to VSI possibly enhanced rapid increases in percentages of nutritious food selection. An analysis of the VSI procedures would more accurately test the efficiency and effectiveness of this procedure.

Another recommended variation in the procedure is to include a tangible reinforcement phase to initiate good food selection. In the present study, for both experimental and control groups, children showed a
tendency to randomly select all foods during baseline I. A tangible reinforcement phase earlier in the procedure may more rapidly facilitate nutritious food selection for all participants.
BIBLIOGRAPHY


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