AN EXPLORATION OF THE EFFECTS OF PARENTAL MODELING ON THE ACQUISITION OF EATING BEHAVIOURS BY OBESE CHILDREN

by

Joseph S. Rallo

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presented to the University of Manitoba
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Abstract

A single case A-B-A design was utilized to investigate the effectiveness of a modeling procedure, using parents as models, to alter the eating behaviour of their obese children. The subjects were four families, each of which included an obese child and an obese parent. The intervention ("B" phase) consisted of instructing the parents (models) to place their forks down between bites of food (target behaviour). Dinner meals were videotaped in each family's home for approximately two weeks. Measures of eating behaviour recorded for each family member included frequency of fork placing, number of bites, number of chews, chewing time, and non-chewing time. The results indicated that (a) the obese children modeled their parents' eating behaviours, although the effect was modest and restricted to the target behaviour, eating speed, and non-chewing time; (b) the age of the child, number of models, and obesity of the child may have been important factors influencing any modeling effects; and (c) eating behaviours were highly variable across meals and subjects. The results are discussed in terms of the usefulness of modeling procedures in the treatment of childhood obesity, and the influence of a parent's eating behaviours, and the family environment in general, on the development and maintenance of a child's obesity.

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Introduction

The use of behavioural methods is currently viewed as one of the most promising means of treatment for mild and moderate obesity (Stunkard & Kaplan, 1977). The increase in popularity of behavioural treatments followed Stuart's (1967) successful application of behavioural techniques to the treatment of eight overweight women. Since then, behavioural treatments have consistently produced greater weight losses than a variety of non-behavioural treatments (Brownell & Stunkard, 1978a). A series of "classic" studies which followed Stuart's (1967) report provided further empirical support for the utilization of behavioural strategies as the choice method for treating obese individuals (Hall, 1972; Hall, Hall, Hanson & Borden, 1974; Harris, 1969; Jeffrey, 1974; Mahoney, 1974; Penick, Filion, Fox & Stunkard, 1971; Romanczyk, Tracey, Wilson & Thorpe, 1973; Wollersheim, 1970). Most of these studies investigated the use of some variation or combination of self and stimulus-control techniques based on Ferster, Nurnberger, and Levitt's (1962) primarily theoretical paper which advocated the use of stimulus control as an "avenue to self-control". In a series of reviews of behavioural treatments of obesity (Abramson, 1973, 1977; Hall & Hall, 1974; Jeffrey, Wing &

Stunkard, 1978; Leon, 1976; Stuart, 1975; Stunkard & Mahoney, 1975; Wilson & Brownell, 1980) it was generally concluded that self-control techniques appeared to be the most promising for producing long-term weight loss. More specifically, treatments which emphasize teaching individuals to permanently alter their eating habits hold the most promise for producing and maintaining weight loss. For example, Leon (1976) concluded:

> The relatively greater effectiveness of behavioral management and environmental control procedures in the maintenance of weight loss may be related to the specific emphasis placed on learning how to permanently change one's eating patterns. (p. 575)

A second conclusion of these reviews was that a recurring feature of weight loss programs has been marked inter-individual variability in outcome. Wilson and Brownell (1980) have suggested that this is because the critical variables governing weight loss have yet to be identified, and recommended looking beyond average group outcome figures to the effects of treatments on specific individuals. One implication of this is that research designs particularly well-suited for obesity studies would be multiple-baseline designs, time-series analysis, and single-subject designs. This variability also suggests that each treatment program must be tailored to each individual subject, a strategy requiring knowledge of which techniques would be the most effective with a specific individual. Unfortunately, many researchers have focused on evaluating treatment "packages" or

designing innovative techniques. Few studies have attempted to isolate and evaluate specific components of large treatment packages. Many components assumed to be important have never been thoroughly investigated. Consequently, in spite of the large number of studies to date, a critical analysis reveals that little can be said about which techniques within the behavioural realm are the most effective. In general, self-control methods appear to be the most promising, but little has been done to assess the efficacy of specific techniques of self control. This is largely the result of methodological problems with the research to date (Stuart, 1975).

One specific technique of self-control which has received much attention is to reduce the speed at which an individual consumes his/her food. Ferster et. al. (1962) suggested that many eaters carry out the sequence of placing food on their fork, inserting it into the mouth, swallowing it, and retrieving more food at a very rapid rate. Several exercises designed to slow this sequence were recommended, and subsequently these exercises were incorporated as either a primary treatment strategy (e.g., Epstein, Parker & McCoy, 1976) or, more typically, as a component of larger treatment "packages" (e.g., Coates, 1977; Gross, Wheeler & Hess, 1976; Hall, Hall, Hanson & Borden, 1974; Harris, 1969; Penick et. al., 1971; Stuart, 1967; Stuart & Davis, 1972; Wollersheim, 1970). These exercises typically involved instructing obese

persons to slow their rate of eating by chewing longer, pausing between bites, placing their fork down between bites, and other similar tactics.

This prescription is based on three assumptions (LeBow, Goldberg & Collins, 1977). The first assumption is that obese persons eat differently from nonobese persons. Thus, obese persons are commonly said to have a unique eating "style". Eating style may include many aspects of eating behaviour, one of which is eating speed. Second, by instructing obese individuals to slow their eating rate an assumption is being made not only that the obese eat more rapidly than the nonobese, but that this is the most important difference in eating style to consider for treatment purposes. Finally, it is assumed that if the obese alter their eating style so that it is similar to the nonobese eating style (i.e., by eating more slowly), they will eat less, and subsequently lose weight.

Research in support of the last assumption is sparse, and this is largely the result of previous studies having merely inferred changes in eating speed from changes in weight, with little attention to assessing whether eating speed was actually altered, and whether this resulted in decreased consumption (Brownell & Stunkard, 1978a; Coates, 1977; Mahoney, 1975a).

The first assumption, that obese persons eat differently from nonobese persons, has been relatively more thoroughly

investigated by directly observing the eating behaviours of obese and nonobese individuals. The results of these studies have been equivocal and largely dependent upon the ages of subjects and the context in which eating was observed. At present, there is little consensus that obese adults eat differently from nonobese adults (Adams, Ferguson & Stunkard, 1978; Dodd, Birkby & Stalling, 1976; Gaul, Craighead & Mahoney, 1975; Hill & McCutcheon, 1975; LeBow et. al., 1977; Mahoney, 1974, 1975b; Marston, London, Cooper & Cohen, 1975; Meyer & Pudel, 1972; Strongman & Hughes, 1980; Warner & Balagura, 1975; Wooley, Wooley & Turner, 1975). In a review of studies on the direct observation of eating behaviours Stunkard and Kaplan (1977) drew the following conclusions: there is a remarkable plasticity of human eating behaviour; that it is strongly influenced by environmental variables; and if eating behaviour is so dependent upon the environment, it may be easy to modify. They criticized past research for failing to recognize the importance of environmental variables, and for failing to report the size or character of the meals eaten. Recent studies investigating the effects of environmental variables on eating behaviour have justified Stunkard and Kaplan's first criticism (Herman, Polivy & Silver, 1979; Polivy, Herman, Younger & Erskine, 1979; Waxman & Stunkard, 1980).

Research investigating differences in eating style between obese and nonobese children has produced more consis-

tent results (Drabman, Hammer & Jarvie, 1977; Drabman, Cordua, Hammer, Jarvie & Horton, 1979; Geller, Keane, & Scheirer, 1981; Keane, Geller, & Scheirer, 1981; Marston, London & Cooper, 1976; Waxman & Stunkard, 1980). These studies demonstrated that obese children, aged one and a half to fourteen years, tended to take more bites per minute than nonobese children, thus providing support for the assumption that obese children may eat more rapidly than their nonobese counterparts. Keane et. al. (1981) concluded that the data clearly support a distinctive eating style for obese boys and girls.

In response to the growing body of research supporting a distinctive eating style in obese children, it has been recommended that the development of techniques to modify eating habits in children would be a valid treatment approach (Drabman, Hammer & Jarvie, 1977; Geller et. al., 1981; Keane et. al., 1981). This recommendation is timely in view of the importance attached recently to treating obese children, based on the growing evidence that obese children tend to become obese adults (Asher, 1966; Garn & Clark, 1976; Garn & Cole, 1980; Rimm & Rimm, 1976). It has been argued that treatment in early life is especially crucial because children might learn and use appropriate eating habits more easily when they are young (Carman, 1976; Coates & Thoresen, 1978; Drabman, Hammer & Jarvie, 1977; Huenemann, 1974). Further support for this recommendation is derived from Ep-

stein et. al. (1976). They reported that slowing the rate at which school children consumed their lunches resulted in a significant reduction in the amount of food they consumed. The strategy which Epstein et. al. employed to modify children's eating speed was to simply instruct them to place their forks down between bites, and to reinforce this behaviour with praise.

The use of modeling procedures (Bandura, 1969) is a behavioural strategy which has only recently been utilized to modify eating behaviours. Modeling techniques have been found to effectively alter the amount of food consumed by individuals (Conger, Conger, Costanzo, Wright & Matter, 1980; DeLuca & Spigelman, 1979; Nisbett & Storms, 1974; Polivy et. al., 1979), the types of food chosen (Birch, 1980), and the number of chews and time spent chewing by individuals (Perry, LeBow & Buser, 1979). It appears from these studies that modeling may be an effective means of altering the eating behaviour of individuals. Of these studies, only Perry et. al. examined the effects of modeling on the eating behaviour of children.

Most of the studies assessing the effect of modeling on eating behaviours were conducted in a laboratory or artificial situation using unfamiliar persons as models. In view of recent evidence (Herman et. al., 1980) which suggests that an individual's eating behaviour may be influenced by the presence of unfamiliar observers, and Stunkard and Ka-

plan's (1977) conclusion that eating behaviours are strongly influenced by environmental variables, this approach is questionable in terms of its external validity. From the standpoint of clinical utility, the efficacy of modeling methods must be demonstrated in more natural situations where clients who would be potential candidates for this technique do most of their eating. The generalizability of modeling effects on eating behaviour from the laboratory to the natural environment has yet to be demonstrated. Even if such effects were found to generalize, there would be practical difficulties in administering modeling techniques over a long period of time in laboratory settings. For example, this might require having the client eat several meals in the presence of an appropriate model over a long time period. This provides a strong argument for considering the application of modeling methods in the client's natural environment, preferably using models to whom the client is already frequently exposed.

Modeling methods seem particularly applicable to altering the eating behaviour of obese children for at least two reasons. First, an observational learning paradigm would require relatively little effort on the part of a child. Minimally, the child would simply be required to eat in the presence of an appropriate model. Second, since a child typically eats the majority of his/her meals in the presence of other family members, he/she has available several relia-

ble potential models in his/her family. In particular, nearly all parents could potentially serve as models for their children. Using parents as models offers a distinct advantage. Parents are likely to possess many of the characteristics deemed valuable for enhancing a model's influence (Rosenthal & Bandura, 1978). For example, a parent is likely to be perceived by his/her children as one who deserves trust, one who compels attention, one who appears as a realistic reference figure to compare oneself with, and one whose conduct offers plausible standards to guide the child's aspirations (Bandura, 1969; Rosenthal & Bandura, 1978).

The purpose of the present experiment is to explore the effects of modeling, using parents as models, on the eating behaviours of their obese children. Specifically, this study will assess whether experimentally induced changes in a parent's eating behaviours will be matched by similar changes in his/her child's eating behaviours.

Considerations have been given to criticisms of past research on obesity by taking the following steps: (a) measuring the impact of the intervention on actual eating behaviours; (b) using subjects likely to present themselves for treatment of obesity; (c) using multiple measures to report the degree of obesity; (d) using both experimenter and subject-collected data; (e) standardizing and reporting the procedural details of service delivery; (f) concentrating on

evaluating the effectiveness of a specific technique commonly used in weight control programs; (g) reporting individual as opposed to group data by utilizing a single-subject design; and, (h) estimating the quantity of food consumed by subjects prior to, and following the intervention.

The target behaviour chosen for this study will be the frequency with which an individual places his/her fork down between bites of food. This behaviour was chosen because of its simplicity and salience. In addition, instructing obese individuals to place their fork down between bites has been a popular technique used in weight control programs to slow eating rate.

The study will be conducted in the subject's own home during dinner meals to increase the generalizability of this research to the natural eating environment.

Since this experiment will utilize a single-case design, it will not be possible to statistically test formal hypotheses. However, based on the modeling literature reviewed previously, the following changes in observed variables are predicted to occur, and will be assessed by visual inspection of the data. First it is predicted that there will be an increase in the frequency with which the target child places his/her fork down after bites following instructions to the parents to begin placing their own forks down after every bite, provided that the parents comply with these instructions.

Second, any change in other observed consummatory behaviours exhibited by the parents either as a result of, or independent of the intervention, will be matched by similar changes in the target child's consummatory behaviours.

Finally, since the intention of instructing an individual to place his/her fork down between bites is to slow his/her eating speed, it is predicted that an increase in the frequency with which either the parents or their children place their forks down between bites will be associated with a decrease in the rate of eating by those individuals as determined by any one or more of the following changes:

1. a decrease in the average bites/minute per meal;
2. an increase in the average length of time between bites during a meal.

Method

Participants

Families were solicited for participation in the study through a newspaper advertisement (Appendix A). The advertisement offered, as an incentive for faithful participation in the study, free participation in a behavioural weight control program administered by the experimenter for one or more of the obese family members. The advertisement was run in two newspapers for 14 days during a three week period.

Selection Criteria. A telephone interview (Appendix B) was used to assess the following criteria:

1. Family composition: The family was to consist of at least one parent and one child (aged 4 to 12 years).
2. Weight of Family members: Parents were to be at least 20% overweight based upon the 1959 Metropolitan Life Insurance company norms (U.S. Dept. of Health, Education and Welfare, 1967). At least one child aged 4 to 12 years was to be at least 20% overweight based upon Falkner's (1962) height and weight standards for children.

Families eligible based on the above two criteria were interviewed (Appendix C) and provided with a copy of the Stanford Eating Disorders Clinic Questionnaire (Agras, Ferguson,

Greaves, Qualls, Rand, Ruby, Stunkard, Taylor, Werne, & Wright, 1976) (Appendix D) to complete. During the interview, each family member was weighed on a physician's beam balance after removing their shoes, outdoor clothing, and any heavy jewellery. A Harpendon skinfold caliper was used to measure triceps skinfold thicknesses (right arm). In addition, height and circumference measures were taken (chest, waist, hips, right thigh).

Families were excluded if any family member was on any kind of special diet, was involved in any organized weight control program, or was trying to control his/her weight through the use of self-help manuals, programmed diets, or popular fad diet books; or, any family member was taking medication that would affect water retention, appetite, or metabolism.

For all respondents who were eligible based on the above criteria, a home visit was arranged to assess lighting, seating arrangement at meals, and practicability of videotaping the dinner meals. Families chosen for participation in the study were required to sign a consent for use of data form (Appendix E).

There were 42 respondents to the advertisement. Of this original 42, only 21 were willing to have their dinner meals videotaped, and only 4 of these 21 families were eligible based on the selection criteria. The other 17 families were not eligible because there were either no obese children (12

families), or no children between the ages of 4 and 12 years (5 families).

Of the four families participating in the study, three were single parent families (mother only), three had only one child and one had two children (one obese male and one nonobese female).

The parents ranged in age from 28 to 51 years (mean 38 years) and weighed between 60.75 and 83.25 kg (17% to 51% overweight). Although one parent did not meet the 20% overweight criterion, this family was included because of (a) the difficulty obtaining suitable participants and, (b) the desirability of including a family with one overweight child and one underweight child. Three of the five parents exceeded the minimum triceps skinfold thickness indicating obesity (Seltzer & Mayer, 1965). The target children were aged 4 yr 6 mo, 8 yr 0 mo, 9 yr 4 mo, and 10 yr 3 mo, and were 28%, 24%, 24%, and 22% overweight (respectively). Three of the four target children exceeded the minimum triceps skinfold thickness indicating obesity. There was one child (female, age 10 yr 6 mo), the sibling of a target child, who was 15% underweight.

In all cases it was the mothers who wanted to lose weight. The one father among the participants was 24% overweight but expressed no interest in losing weight. The mothers each had a long history of weight problems, and recalled attempts to lose weight beginning between the ages of

10 yr and 15 yr. The number of past attempts to lose weight (self-reported) ranged from 4 to 10 (mean number of previous attempts, 7.8), and all parents had tried at least one supervised diet. No data was available on the children's weight history, and most parents reported that they couldn't recall when their children first became overweight, but that they have recently become concerned about it.[1]

All parents reported some obesity in their families of origin, and three of four mothers reported that their own parents were slightly to very overweight.

Observers

The selection interviews, pre-observation phase and post-observation phase were conducted by the author. During the baseline, intervention and post-intervention phases data was collected by one nonobese male (the author) or by one nonobese female. The male observer was a graduate student in clinical psychology and the female observer was an undergraduate student enrolled in a psychology research methods

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[1] Typically, when questioned about their children's weights, parents reported that their children were always "good eaters" but that they have only recently become aware that there might be a weight problem. This generally occurred as the result of the overweight child's experiences at school or with peers who may have teased him/her about his/her weight. The fact that parents did not recognize earlier that their children might have a weight problem is understandable considering (a) "plump" children who were "good eaters" were often considered "healthy" by their parents, and (b) it is difficult for practitioners, let alone parents, to assess a child's degree of obesity (LeBow, 1977). Parents certainly are not unbiased observers of their children's weight or eating practices.

course. Both observers were trained to set up videotape equipment and to give standardized instructions to families (Appendices H, I). In addition, both observers were trained to collect information on quantities of food consumed during a meal. Each family was randomly assigned to one of the two observers for the baseline, intervention and withdrawal phases.

Consummatory behaviours were coded from videotapes by the author. An additional research assistant with graduate training in research methods and design was trained to code eating behaviours from videotapes. This research assistant coded randomly selected videotapes throughout the study and this information was used to calculate the reliability of the coding procedure.

Setting

All phases of the experiment were conducted in the family's home, with all members present. Meals were typically consumed in the kitchen or dining room. During observed meals, each member was instructed not to begin eating until everyone was seated, and to remain at the table until they were finished. Watching television, reading, or similar activities were not permitted while eating. The observer remained in the meal setting long enough to record information on quantities and types of foods served to each member, and to begin videotaping the meal. The observer then removed

himself/herself from the setting, and returned at a pre-arranged time following the meal to record quantities consumed and to dismantle the equipment.

Materials

The research materials included a physician's beam balance for weighing family members (Health o Meter, Continental Scale Corp.), a Harpendon skinfold caliper (John Bull, British Indicators Ltd.), a household scale for weighing food portions, two Sportex 7 jewel stopwatches for timing meal length, bite intervals and chewing times, and The Barbara Kraus 1981 Calorie Guide to Brand Names and Basic Foods (1981) for calculating the calorie content of food portions. Dinner meals were videotaped using two different systems. One system was a portable Panasonic Omnivision II color video cassette (VHS) recorder and a matching colour camera mounted on a tripod. The second system consisted of a Sony Solid State Videocorder (VTR), model AV-3600, and a Phillips black and white video camera mounted on a tripod. Videotapes/cassettes were viewed on a Sony Transistor Video Monitor, model CVM-115. Eating behaviours were coded on to audio cassettes using a Phillips Portable Cassette Recorder, model N2205/42.

Observation Procedure and Behaviour Definitions

Each family specified in writing (See Appendix F) a minimum of 12 days over a two to three week period during which they were willing to have their evening meals videotaped. On the scheduled days the observer arrived at the family's home approximately 15 minutes prior to the scheduled meal time and set up the videotape equipment so as to permit the recording of all family members' eating behaviours. Family seating arrangements were re-arranged where necessary. The quantities and types of foods served to each member were recorded, weighing portions when necessary. The observer then started the videotape equipment, and either left the home or went to a separate room where he/she could not interact with the family during the meal. Following the meal, the observer returned to the eating area, recorded what was eaten, dismantled the videotape equipment, and left the home. Quantities of second helpings of food were estimated from the videotapes.

Videotapes were reviewed the same evening and eating behaviours were coded onto an audio cassette tape using a coding system developed by LeBow, Goldberg and Collins (1976) for investigating eating behaviour. This system involves clicking, tapping or rubbing the microphone of a cassette recorder to code different consummatory behaviours. Using this methodology, videotapes could be erased and re-used while retaining a permanent record of the following behaviours:

1. Number of bites: a bite was defined as moving solid food to the mouth followed by closing the jaws on it.
2. Inter-bite interval (IBI): defined as the amount of time between any two consecutive bites.
3. Number of chews: a chew was defined as closing the jaws on food--the first chew in a bite interval is the bite itself. This was measured most easily by watching the subject's chin move.
4. Chew time: defined as the total time of all intervals spent chewing during a meal. A chew interval would begin with a bite and end with the last chew before the next consecutive bite.
5. No-chew time: defined as the total time not spent chewing.
6. Number of times the fork is placed on the table (hereafter referred to simply as "forks"): placing the fork down on the table was defined as when the subject placed his/her fork down such that it was resting on his/her plate, or on the table, and his/her fingers were not closed around the fork. The hand or fingers could have been touching or resting on the fork, provided that the fork was not being held by the hand.
7. Meal duration: the beginning of a meal for each family member was defined as when the first bite of food was taken. Termination of the meal was defined as

the last chew response. Total meal duration should equal the sum of all of the inter-bite intervals plus the length of the last chew interval for each family member.

Measures

The following measures were calculated to assess the predictions of this study.

1. Forks per bite (F/B): This was the target behaviour and was defined as the number of times a family member placed his/her fork down during a meal divided by the total number of bites taken by that individual during the meal. A forks per bite rate was calculated for each family member for each observed meal. This measure of the rate of fork placing behaviour was chosen rather than forks per minute since the length of a meal may have been dependent on the fork placing behaviour--that is, the more often an individual placed his/her fork down during a meal, the longer it may have taken him/her to finish. In addition, the length of the meal was highly dependent on the nature of the foods eaten during the meal.
2. Bites per minute (B/M): This was defined as the total number of bites taken by an individual during a meal divided by the total number of minutes taken by that individual to complete the meal.

3. Mean inter-bite interval: This was defined as the average length of the inter-bite intervals (IBI) for an individual during each meal. Although this measure is directly dependent on bites per minute (i.e., a decrease in B/M should be associated with an increase in mean IBI), it was included here in order to allow comparability of this study with other independent studies, to provide a more meaningful interpretation of the results, and when combined with B/M it provides a multiple measure of eating speed in general.
4. number of chews per bite (C/B).
5. number of drinks per bite (D/B).
6. mean time spent chewing each bite of food (Mean chew time per bite, or mean CT/B).
7. mean time spent not chewing during an inter-bite interval (mean no-chew time per bite, or mean NCT/B).

Forks per bite provided a direct measure of the extent to which children modeled changes in their parents' fork placing behaviour. The two measures of eating speed (bites/min and mean IBI) were used to examine the prediction that an increase in fork placing behaviour would be associated with a decrease in eating speed. The remaining measures were used to assess the extent to which changes by the parents in consummatory behaviours not directly manipulated by the experiment were matched by similar changes in the children's consummatory behaviours.

Reliability

The reliability of the consummatory behaviour coding system was assessed by having two observers independently code an individual family member's eating behaviour from the same videotape. Reliability checks were conducted for five randomly selected meals for each family, yielding a total of 20 reliability checks. Reliability coefficients were calculated for frequency counts of bites, chews, drinks, and fork placing by dividing the number of agreements by the the sum of the number of agreements plus the number of disagreements, and multiplying by 100.

Experimental design

This study utilized a single case withdrawal design (A-B-A) with three replications of the original experiment (i.e., a total of four experiments). The baseline ("A") phase consisted of a minimum of four separate days of observation. This follows from the recommendation by Barlow and Hersen (1973, cited in Hersen & Barlow, 1976) that "a minimum of three separate points, plotted on a graph, during this baseline phase are required to establish a trend in the data" (p. 76). The intervention ("B") phase consisted of a minimum of four days of observation during which the conditions of the intervention were in effect. Following the "B" phase, the conditions of the intervention were withdrawn and observations were recorded for a minimum of three additional

days (withdrawal phase). Whenever possible, all observation days were scheduled on consecutive days.

Because of the naturalistic nature of this study, and the inconvenience of the procedure to the families involved, the length of the three phases was typically limited to the minimum criteria set out above.

Procedure

Pre-observation phase. The pre-observation phase consisted of one visit to the family's home in order to: (i) negotiate a contract outlining the responsibilities of the family members and the experimenter, and the scheduled days for observation (Appendix F); (ii) explain the procedure to the family using standardized instructions (Appendix G); and (iii) make the family members more comfortable with the observer's presence in their home in order to minimize reactivity during the initial days of observation.

Pre-Intervention ("A") phase (baseline). Meals were recorded for a minimum of four consecutive days using the observation procedure outlined earlier. Instructions and procedures during this phase were standardized (Appendix E). Family members were asked to continue eating during this phase as they had prior to their contact with the experimenter. The specific nature of the intervention (next phase) was unknown to the family during this phase.

Intervention ("B") phase. Following the completion of the baseline phase, and prior to the first day of observation in the intervention phase, the observer met with the parents of each family in order to explain to them the conditions of the intervention. Each parent was instructed to place his/her fork down on the table or on his/her plate after each bite of food until he/she had chewed and swallowed each mouthful (Appendix I). A brief typed summary of these instructions was given to the parents at this time. Prior to each meal the parents were reminded of the instructions, and provided with praise for their previous day's efforts. When necessary, inaccuracies in the implementation of the instructions were corrected. The children were not instructed to place their fork down between bites, but were informed by the observer (at the beginning of this phase) that their parents were being asked to do so. Instructions were given to the parents outlining how they should handle questions from their children related to the intervention. Every effort was made to ensure that the children were neither encouraged nor discouraged by either their parents or the observer from modifying their fork placing behaviour.

Post-intervention ("A") phase (withdrawal). Following the termination of the intervention phase, the parents were informed that they were not required to place their fork down between bites for the remaining days of observation. They were asked to try to return to their "normal" pre-in-

tervention eating behaviour. In cases where the parents expressed that they wanted to continue with their fork placing behaviour because they felt that they were benefiting from it, they were told that a definitive statement regarding the efficacy of the intervention would not be possible unless data could be collected for a few more days during which they did not implement this technique. Following that, they were free to re-implement the technique if they so desired.

Post-observation phase. Following the last day of the post-intervention phase, a meeting was arranged with all family members in order to collect post-observation data. This meeting typically took place following the recording of the last scheduled meal. Arrangements were made to re-weigh family members, and re-measure triceps skinfold thicknesses and body point circumferences. Each family member was individually administered the post-observation questionnaire (Appendix J). This questionnaire was designed to assess factors which may have threatened the internal validity of the study (for example: historical factors which may have affected eating rate; knowledge of the purpose of the study), as well as to gather information on the difficulties each family member may have experienced participating in the study (for example: the effect of the video camera on their dinner meals; the willingness to continue with the study at various points).

Contradictory Messages Questionnaire. Each child was administered the Contradictory Messages Questionnaire (LeBow & Rallo, note 1) (Appendix K). This questionnaire was developed to help uncover the frequencies of contradictory messages communicated to family members which may exacerbate obesity or inhibit its removal. The questionnaire was made up from a pool of questions believed to assess the existence of four contradictory messages delivered by parents and peers to obese children. The "meta-communication" delivered by these four messages would be something like:

Message B-4:

> "Play with us to be one of us, but fatties aren't good athletes, so don't play with us."

Message A-1:

> "Clean your plate if you wan't dessert, but you're getting too fat from eating too many sweets."

Message A-2:

> "Food is splendour, fat is ugly--but not entirely so."

Message B-3:

> "Eat to be friendly, but best friends aren't fat."

For each of these messages there were several related items to which the child was asked to respond. Scoring consisted of identifying response patterns which appeared to reflect the existence of each message. A table of these response patterns and a detailed description of the scoring procedure are provided in Appendix K.

All questionnaires were administered verbally, and other family members were not present during each individual administration. Family members were then given a full explanation of the true purpose of the study.

Results

Subject characteristics

Pre-observation and post-observation subject characteristics describing family composition, age, height, weight, percent overweight, and triceps skinfold thicknesses are presented in Table 1. Pre and post observation circumference measures are found in Appendix L (Table L.1). There were no marked changes during the study in any of the skinfold or circumference measures, and no significant weight losses for any of the subjects.

Post-observation questionnaires

Parents. Of the five parents involved in the study, none reported any illnesses, injuries or dental work which might have affected their eating behaviour significantly. None of the parents started any weight control programs or new diets during the study. Three of the parents stated that they placed their forks down between bites during unobserved meals (breakfasts, lunches) giving the following reasons:

> "We found it increased our conversation during dinner because we ate more slowly."
>
> "I found I became fuller, faster...I wasn't eating as much."
>
> "It became automatic."

Table 1

Characteristics of Subjects at

Pre-observation and post-observation phases

Subjects	Age (yr, mo)	Height (cm)	Weight kg/% overweight		T.S.T.[b] (mm)	
			Pre	Post	Pre	Post
Family 1						
Mother	28, 1	154.9	78.8/51	77.4/48	31.0	31.0
Daughter[a]	8, 0	132.1	20.9/24	20.9/24	12.0	12.0
Family 2						
Mother	39, 3	165.1	69.3/17	68.0/15	16.2	15.2
Son[a]	9, 4	137.2	40.1/24	41.1/27	15.2	15.0
Daughter	10, 6	137.2	27.5/0	27.9/0	10.2	10.0
Family 3						
Mother	28, 5	162.6	60.8/21	63.0/25	29.0	29.0
Son[a]	10, 3	139.7	39.2/22	42.8/33	17.0	17.0
Family 4						
Mother	44,10	160.0	66.2/20	66.2/20	37.4	37.0
Father	51, 6	170.2	83.3/24	83.3/24	18.9	18.9
Son[a]	4, 6	111.8	24.8/28	24.8/28	19.6	19.6

[a]Target child.

[b]Tricep Skinfold Thickness.

Two of the parents reported that the video camera had no effect on them during meals. The other three parents reported that having their meals videotaped initially made them more aware of having dinner prepared in advance, and caused them to inhibit their bad eating habits. All three said that they became accustomed to the camera after one or two days. Two of the four families reported that they found their involvement in the study to be restricting insofar as always eating at a pre-arranged time, and making themselves available for observation on the scheduled days. The general feeling presented by three of the families was one of relief when the study was over, and they stated that they would have likely resisted extending the number of days of observation beyond the number of days scheduled. None of the parents reported noticing any significant changes in their children's eating behaviours, but two parents reported that their children either misbehaved more, or were better behaved during the observation of meals. None of the parents guessed that the purpose of the study was to examine whether their children modeled the fork placing behaviour.

Children. Two of the four target children reported no illnesses, injuries or dental work which might have affected their eating behaviour during the study. One target child reported that she bit her tongue on the last day, and another reported having had a mild cold during the last two days. The sibling of one of the target children (family 2)

reported having suffered from the flu during the first two days of the study. None of the children started any new diets or weight control programs during the study period. Two of the target children said that they were aware that their parents were trying to put their forks down between bites. All of the children reported that their parents did not encourage them to, nor discourage them from placing their forks down between bites. Four of the children stated that the videocamera had no effect on them during their meals, and one child (a target child) reported having felt uncomfortable at first, but said that this feeling only lasted a few days. None of the children guessed the purpose of the study.

Reliability

Reliability of the eating behaviour coding system was assessed twenty times for each frequency measure (bites, chews, drinks, forks). The mean reliability coefficients for each measure are presented in Table 2. The mean reliability for the four families across all four measures was 91.2% (range 82.8 - 96.4).

Table 2

Reliability of the eating behaviour coding system

	Inter-observer agreement[a]	
Measure	Mean[b]	Range
Bites	95.3	83.0 - 100.0
Chews	82.8	55.0 - 97.0
Drinks	96.4	67.0 - 100.0
Forks	90.4	57.0 - 100.0

[a]Calculated as the number of agreements divided by the sum of the number of agreements plus disagreements.

[b]The mean is the average inter-observer agreement across 20 reliability checks.

Accuracy of implementation by parents

Parents were asked to place their forks down after every bite of food during the intervention phase. In order to be able to assess whether this behaviour was modeled, it was essential to first determine if the parents did in fact implement the target behaviour. A measure of accuracy of implementation is provided by the forks per bite measure for each parent during each day of the intervention phase. Thus, a forks/bite value of 1.00 indicates that the fork was placed down after every bite (perfect accuracy of implementation), while values less than 1.00 indicate less than perfect accuracy of implementation. Across all parents and all meals during the intervention phase, the mean accuracy of implementation was 0.82 (range 0.36-1.00 for individual meals). Table 3 presents the mean accuracy of implementation by individual parents across all days of the intervention phase.

Eating behaviours

Tables 4 to 7 present the mean values of each measure of eating behaviour for each of the three phases of observation (baseline, intervention, withdrawal), for families 1 to 4 respectively. Raw data are found in Appendix L.

Fork placing behaviour. Figures 1 to 4 illustrate the effects of increased fork placing behaviour by the parents on the fork placing behaviour of their children.

Table 3

Accuracy of implementation of instructions by parents (intervention phase)

Family	Parent	Accuracy of implementation	
		Mean	Range
1	Mother	0.93	0.75 - 1.00
2	Mother	0.62	0.36 - 0.84
3	Mother	0.93	0.86 - 1.00
4	Mother	0.71	0.63 - 0.79
	Father	0.87	0.70 - 0.95

Note. Maximum accuracy of implementation = 1.00

Table 4

Mean levels of measures of eating behaviours for the baseline, intervention, and withdrawal phases

Family 1

Measure	Phase		
	Baseline	Intervention	Withdrawal
Forks/bite			
Mother	0.08	0.93	0.50
Daughter	0.07	0.19	0.17
Bites/min.			
Mother	5.70	3.03	3.84
Daughter	4.90	4.51	5.31
IBI[a]			
Mother	10.71	20.89	16.42
Daughter	12.53	13.70	11.47
Chew-time/bite[b]			
Mother	5.78	9.90	6.85
Daughter	6.27	5.69	3.71
No chew-time/bite[b]			
Mother	4.92	10.84	9.47
Daughter	6.19	7.97	7.74
Chews/bite			
Mother	7.15	9.84	7.71
Daughter	6.33	5.19	3.33
Drinks/bite			
Mother	0.00	0.03	0.00
Daughter	0.03	0.05	0.04

[a]Inter-bite interval (in seconds).

[b]In seconds.

Table 5

Mean levels of measures of eating behaviours for the baseline, intervention, and withdrawal phases

Family 2

Measure	Phase		
	Baseline	Intervention	Withdrawal
Forks/bite			
Mother	0.09	0.62	0.07
Son[a]	0.10	0.14	0.06
Daughter	0.20	0.04	0.06
Bites/min.			
Mother	6.42	3.88	5.76
Son	5.97	3.63	6.15
Daughter	4.71	5.56	6.55
IBI[b]			
Mother	9.72	16.08	10.50
Son	10.29	18.35	9.96
Daughter	14.79	11.17	9.45
Chew-time/bite[c]			
Mother	5.45	8.26	5.99
Son	4.23	5.57	4.35
Daughter	5.52	4.45	4.82
No chew-time/bite[c]			
Mother	4.26	7.81	4.55
Son	6.12	12.73	5.65
Daughter	9.40	6.72	4.63
Chews/bite			
Mother	5.13	8.61	7.02
Son	4.80	5.97	5.61
Daughter	5.68	4.38	6.00
Drinks/bite			
Mother	0.06	0.09	0.02
Son	0.07	0.12	0.07
Daughter	0.07	0.04	0.05

[a]Target child.

[b]Inter-bite interval (in seconds).

[c]In seconds.

Table 6

Mean levels of measures of eating behaviours for the baseline, intervention, and withdrawal phases

Family 3

Measure	Phase		
	Baseline	Intervention	Withdrawal
Forks/bite			
Mother	0.04	0.93	0.23
Son	0.09	0.17	0.15
Bites/min.			
Mother	6.20	2.94	4.20
Son	3.76	3.26	3.35
IBI[a]			
Mother	9.94	19.54	14.85
Son	16.23	20.38	19.58
Chew-time/bite[b]			
Mother	6.22	9.99	7.13
Son	6.67	8.44	9.46
No chew-time/bite[b]			
Mother	3.70	9.36	7.67
Son	9.56	12.27	10.01
Chews/bite			
Mother	7.37	12.65	9.08
Son	8.52	9.91	11.00
Drinks/bite			
Mother	0.01	0.04	0.09
Son	0.04	0.10	0.09

[a]Inter-bite interval (in seconds).

[b]In seconds.

Table 7

Mean levels of measures of eating behaviours for the baseline, intervention, and withdrawal phases

Family 4

Measure	Phase		
	Baseline	Intervention	Withdrawal
Forks/bite			
Mother	0.08	0.71	0.06
Father	0.17	0.87	0.19
Son	0.07	0.27	0.05
Bites/min.			
Mother	4.98	2.57	4.77
Father	6.47	2.60	6.04
Son	5.38	3.84	5.25
IBI[a]			
Mother	12.42	23.78	12.81
Father	9.42	23.68	10.12
Son	11.36	18.02	11.53
Chew-time/bite[b]			
Mother	6.56	11.64	6.59
Father	3.84	10.88	4.55
Son	4.41	7.02	4.96
No chew-time/bite[b]			
Mother	5.91	12.15	6.26
Father	5.57	12.76	5.60
Son	6.93	11.10	6.59
Chews/bite			
Mother	7.93	14.17	9.74
Father	4.85	15.21	7.04
Son	5.21	7.87	6.67
Drinks/bite			
Mother	0.00	0.04	0.20
Father	0.05	0.17	0.13
Son	0.02	0.02	0.00

[a]Inter-bite interval (in seconds).

[b]In seconds.

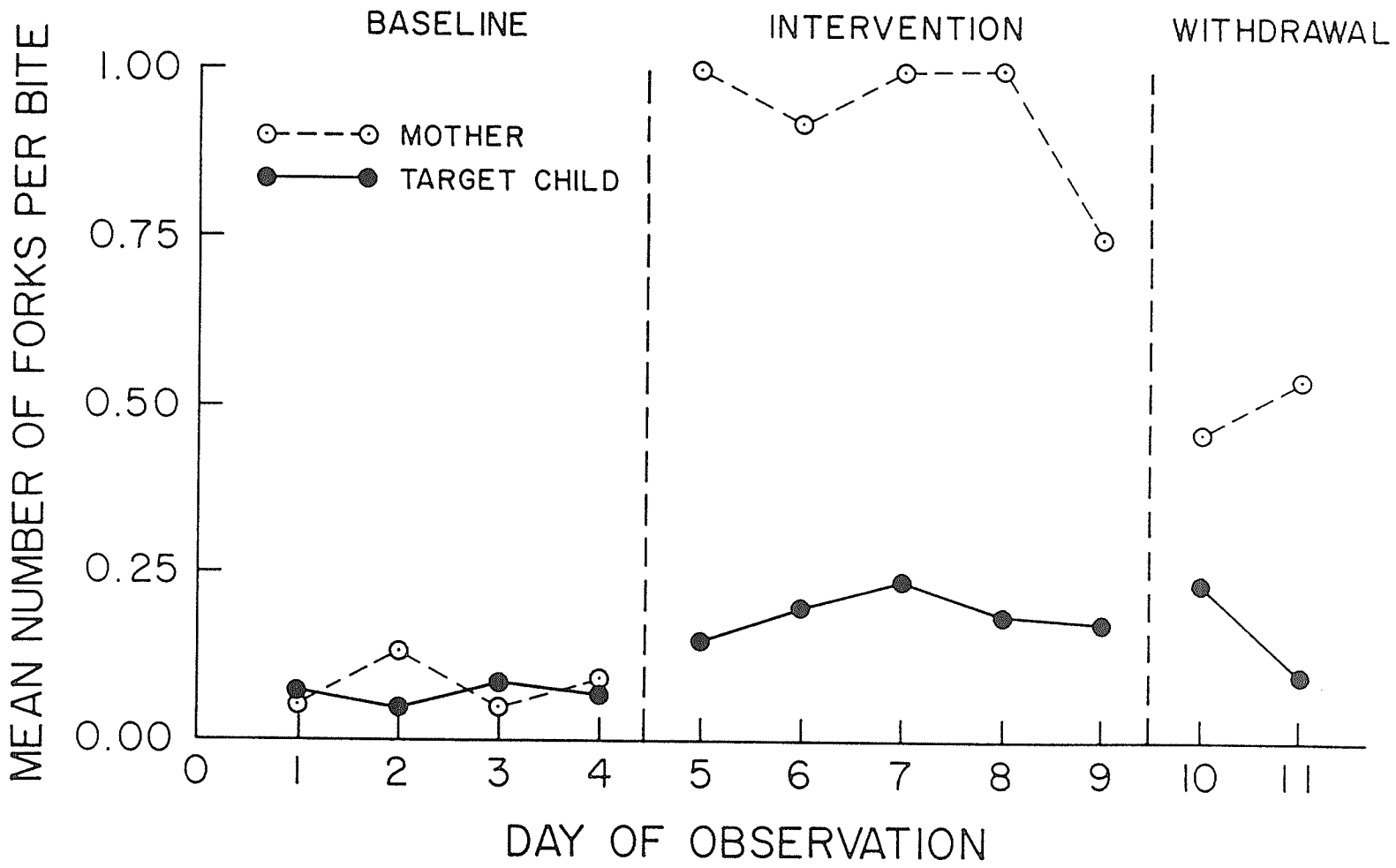

Figure 1. Mean rate of fork placing behaviour versus day of observation for family 1.

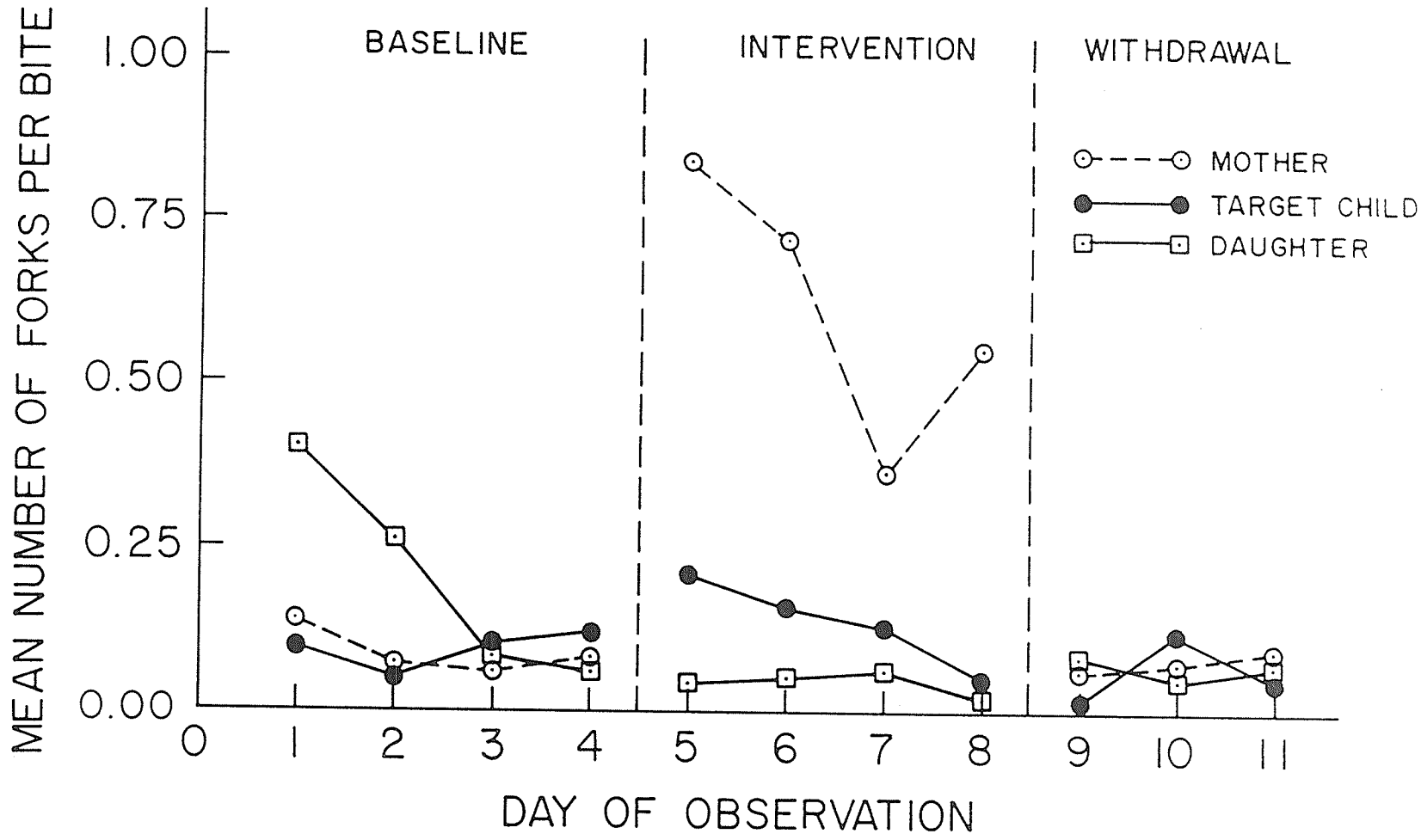

Figure 2. Mean rate of fork placing behaviour versus day of observation for family 2.

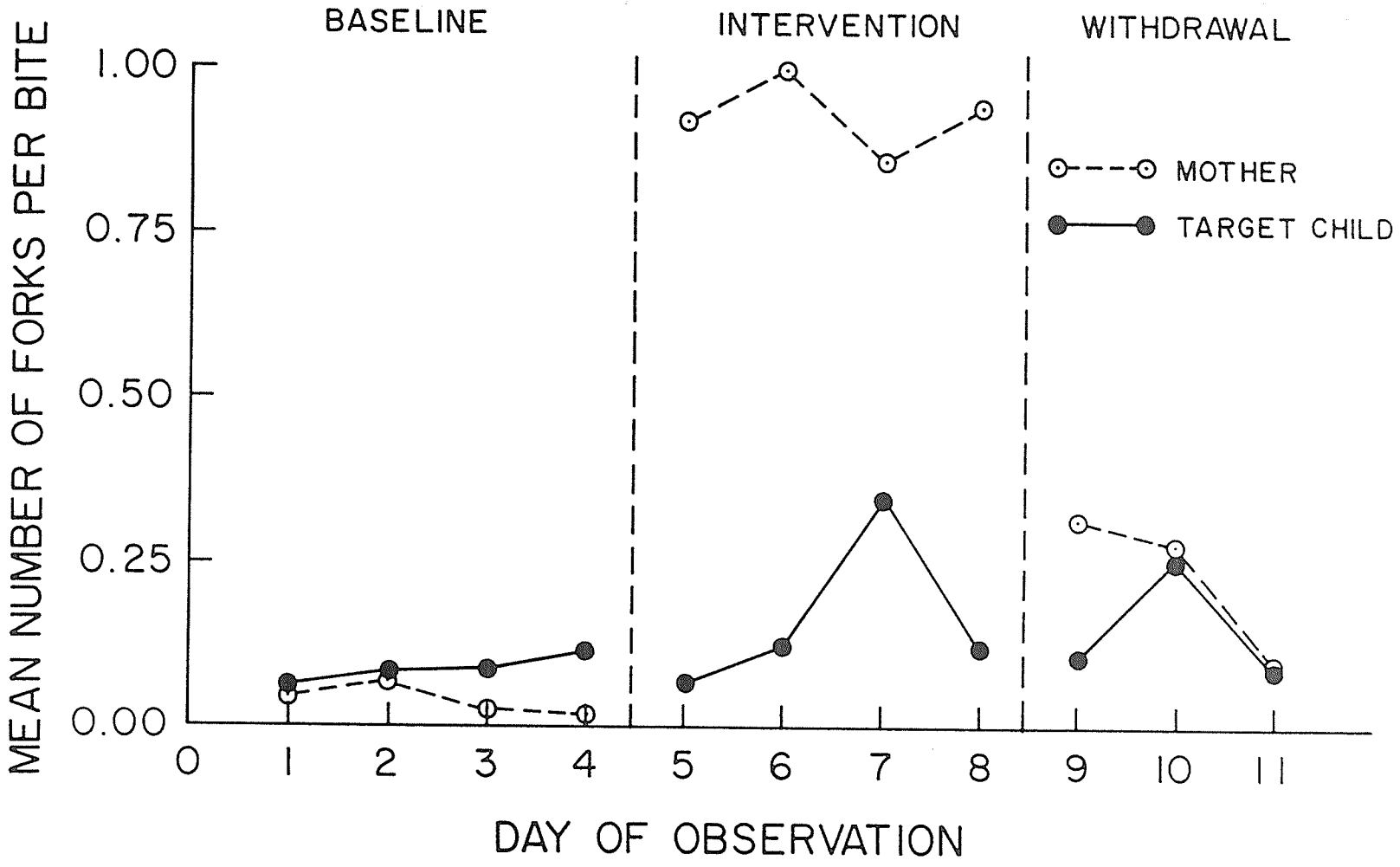

Figure 3. Mean rate of fork placing behaviour versus day of observation for family 3.

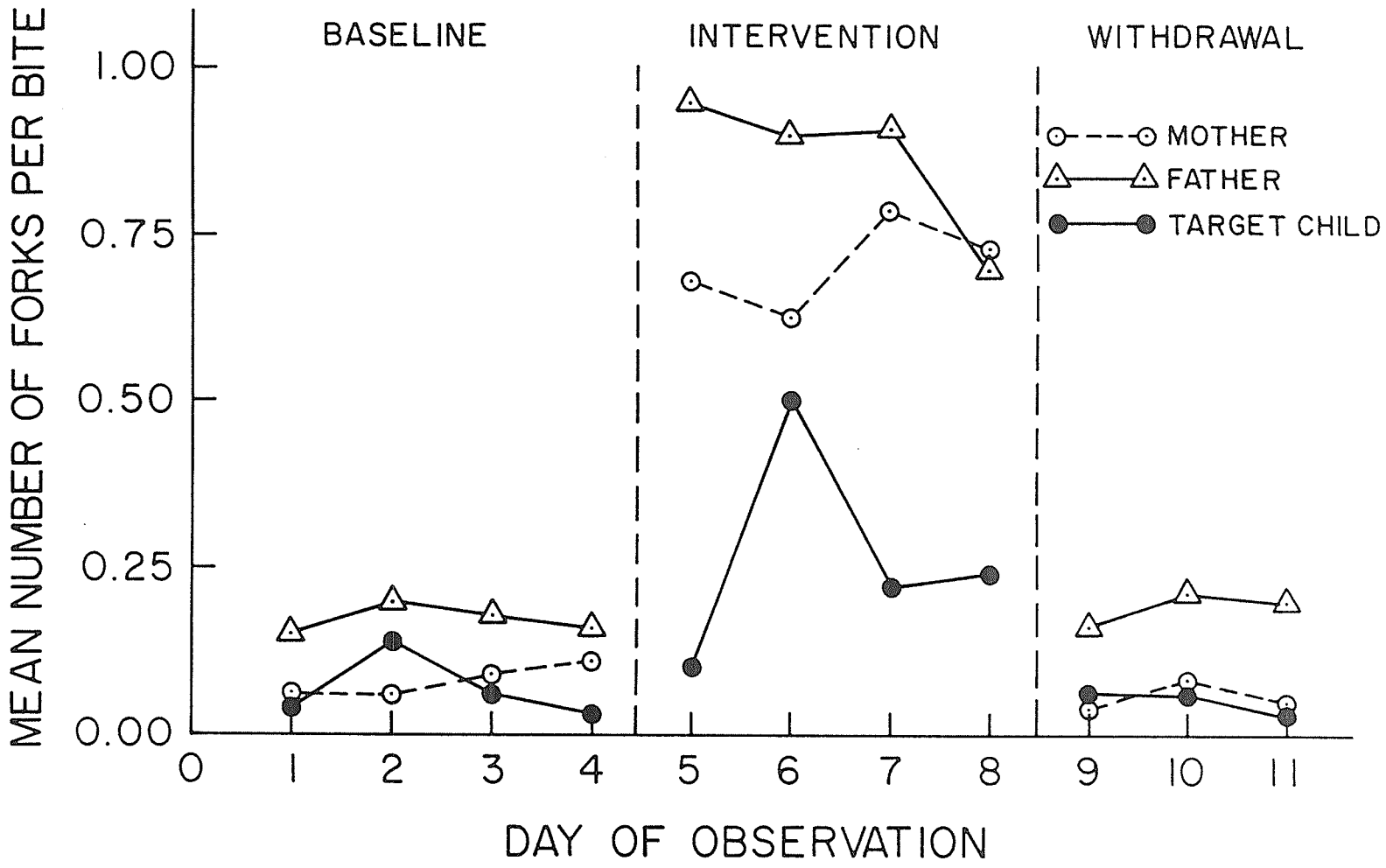

Figure 4. Mean rate of fork placing behaviour versus day of observation for family 4.

The results for all four families suggest that large changes in the frequency of fork placing behaviour by parents were matched by similar but much smaller changes by the target children.

Mean baseline levels of forks per bite for the parents ranged from a low of 0.04 (family 1) to a high of 0.17 (family 4, father). The target children's mean baseline levels ranged from 0.07 (family 1) to 0.10 (family 2). During the intervention phase, when parents were instructed to place their forks down between bites, their mean levels ranged from 0.62 (family 2) to 0.93 (families 1 and 3), while for the children these values ranged from a low of 0.14 (family 2) to a high of 0.27 (family 4). Thus, the mean frequency at which the target children placed their forks down between bites increased 40% to 286% during the intervention phase.

For three of the target children the forks/bite rate steadily increased to a maximum value by day 2 or 3 of the intervention, then decreased for the remaining days. Target child 2 exhibited the largest increase on day 1 (0.21) then a steady decrease to 0.05 by day 4. The largest single increase was exhibited by target child 4 whose forks/bite rate reached a maximum of 0.50 on the second day of the intervention. Target child 4 was the only child exposed to two models (mother and father).

When the intervention was withdrawn all of the parents placed their forks down less often than they did during the

intervention phase (mean range: 0.06 - 0.50), although two of the parents continued to place their forks at a rate higher than during baseline (mean: 0.23, 0.50). This failure by two of the parents to return to their baseline level after the intervention was withdrawn was also exhibited by their two target children whose mean withdrawal levels were 0.17 and 0.15.

The only child whose fork placing behaviour appeared unaffected by the intervention was the nonobese sibling of target child 2 (Figure 2). Except for days 1 and 2 of the baseline phase, the nonobese child's forks/bite rate remained fairly steady throughout the period of observation.

Eating speed. The effects of the intervention on bite rate are illustrated in Figures 5 to 8. The eating speed data (bites/minute and inter-bite interval) suggest that increased fork placing behaviour by both the parents and the target children was associated with a decrease in the rate at which food was consumed, as indicated by a decrease in bites/minute and an increase in inter-bite interval. In addition, changes in a parent's mean eating speed from one phase to the next were matched by similar changes in the eating speed of their obese children.

Mean baseline levels of bites per minute ranged from 4.98 (family 4, mother) to 6.47 (family 4, father) for the parents, and from 3.76 (family 3) to 5.97 (family 2) for the target children.

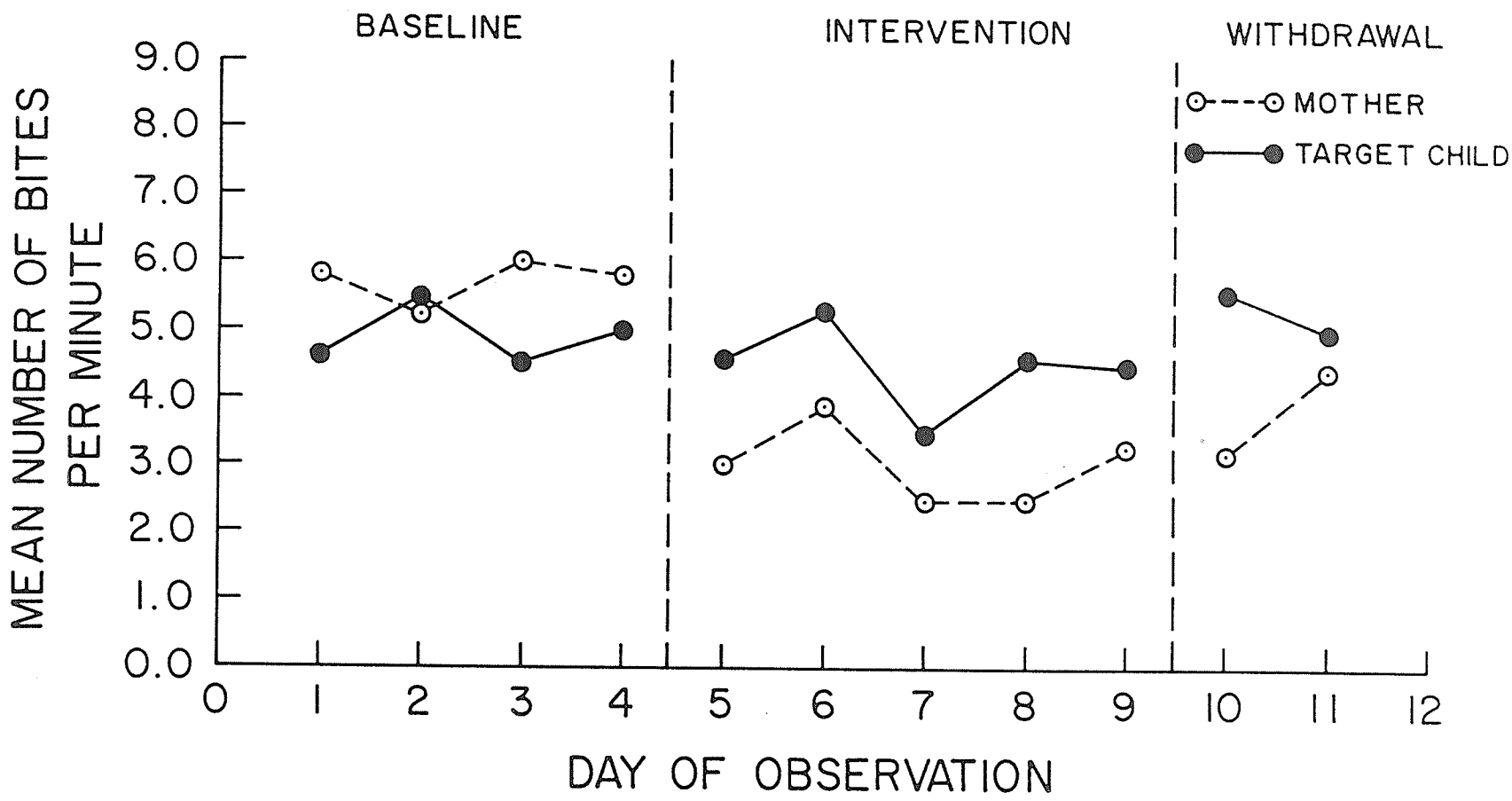

Figure 5. Mean number of bites per minute versus day of observation for family 1.

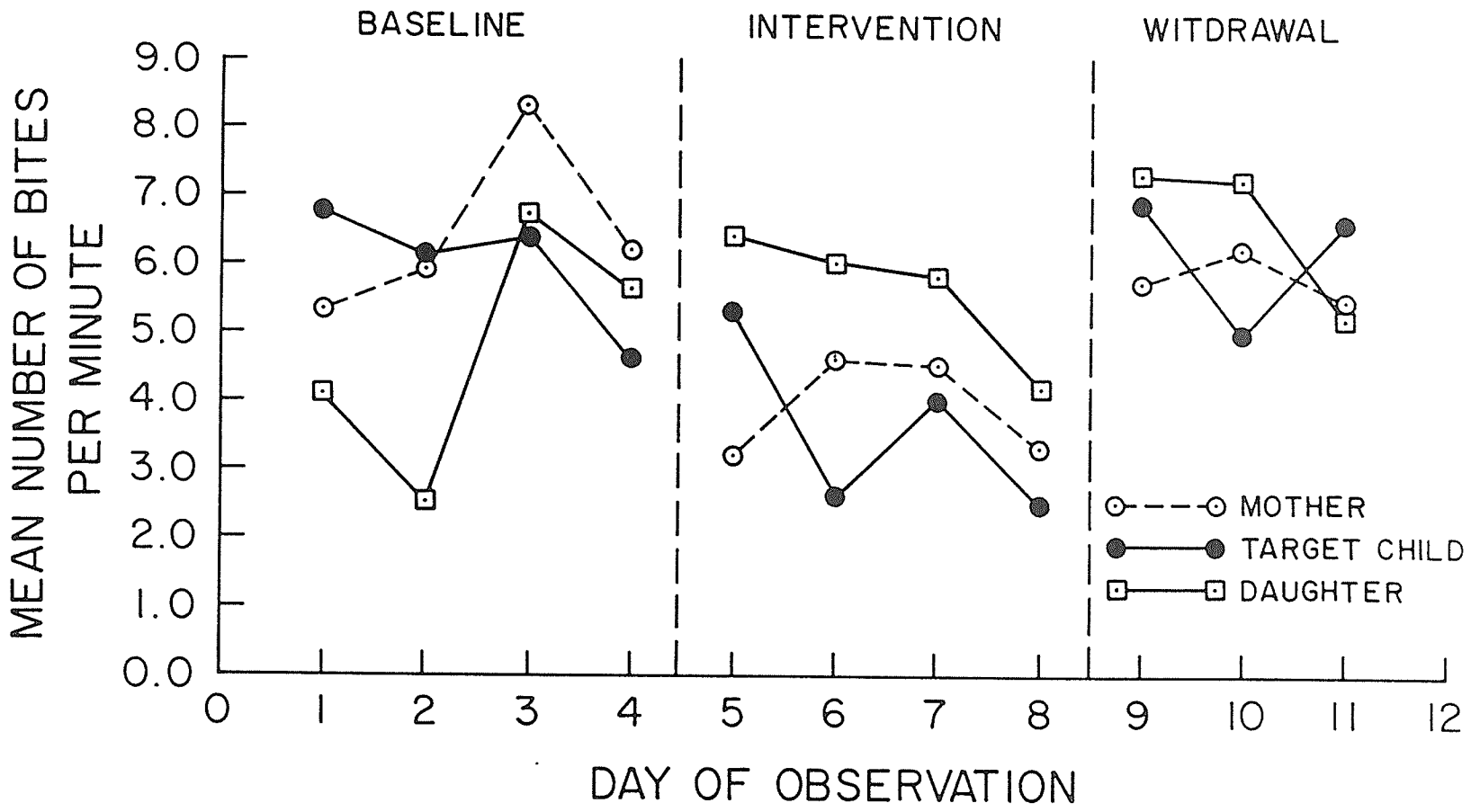

Figure 6. Mean number of bites per minute versus day of observation for family 2.

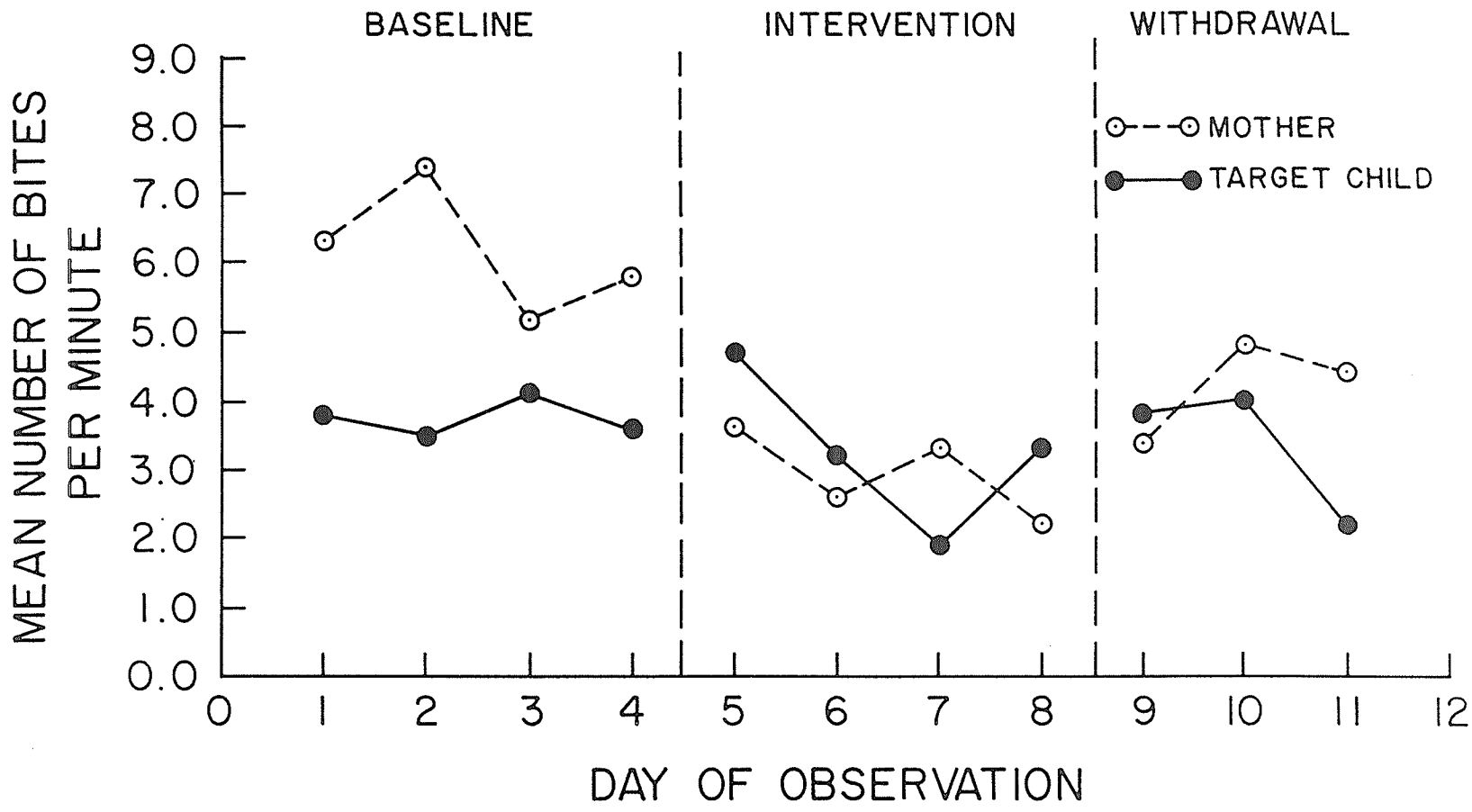

Figure 7. Mean number of bites per minute versus day of observation for family 3.

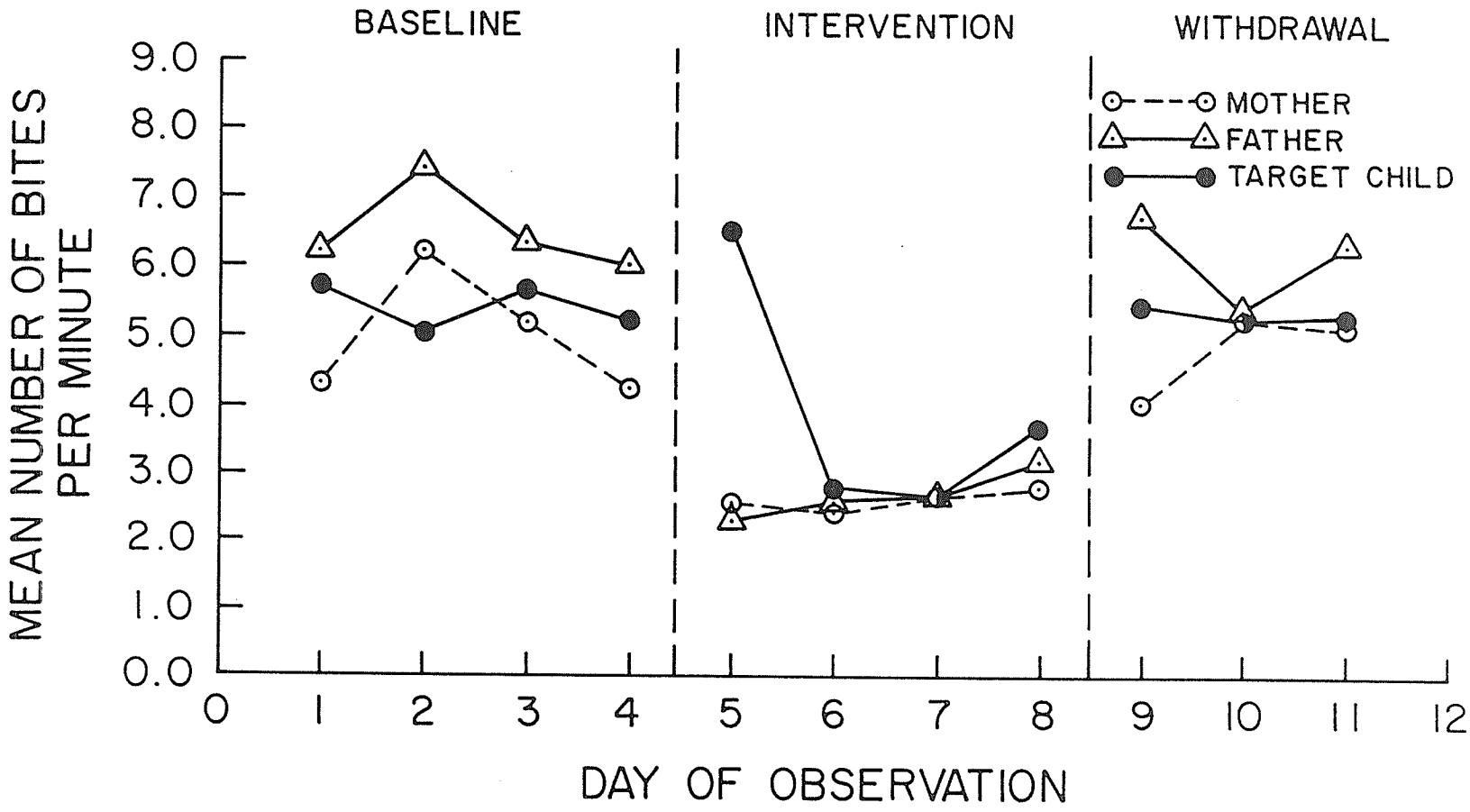

Figure 8. Mean number of bites per minute versus day of observation for family 4.

During the intervention phase the mean levels for the parents ranged from a low of 2.57 (family 4) to a high of 3.88 (family 2); for the children the range was 3.26 (family 3) to 4.51 (family 1). When the intervention was withdrawn the mean bites per minute for the parents ranged from 3.84 (family 1) to 6.04 (family 4, father); and from 3.35 (family 3) to 6.15 (family 2) for the target children. The mean inter-bite intervals for each phase indicate that the parents took an average of from 6.36 to 14.26 seconds longer between bites during the intervention phase than they did during the baseline phase. Similarly, the target children took an average of from 1.17 to 8.06 seconds longer. The eating rate of the nonobese child in the sample (Figure 6) appears to have been unaffected by the intervention.

Changes in other measures of eating behaviour. In addition to increased fork placing behaviour and decreased eating speed, the parents exhibited increases in the following measures of eating behaviours during the intervention phase: mean chew time per bite, mean no-chew time per bite, number of chews per bite, and number of drinks per bite. A similar increase in no-chew time per bite was replicated across all four target children. This is illustrated in Figures 9 to 12. Both the parents and the target children exhibited a decrease in no-chew time per bite when the intervention was withdrawn.

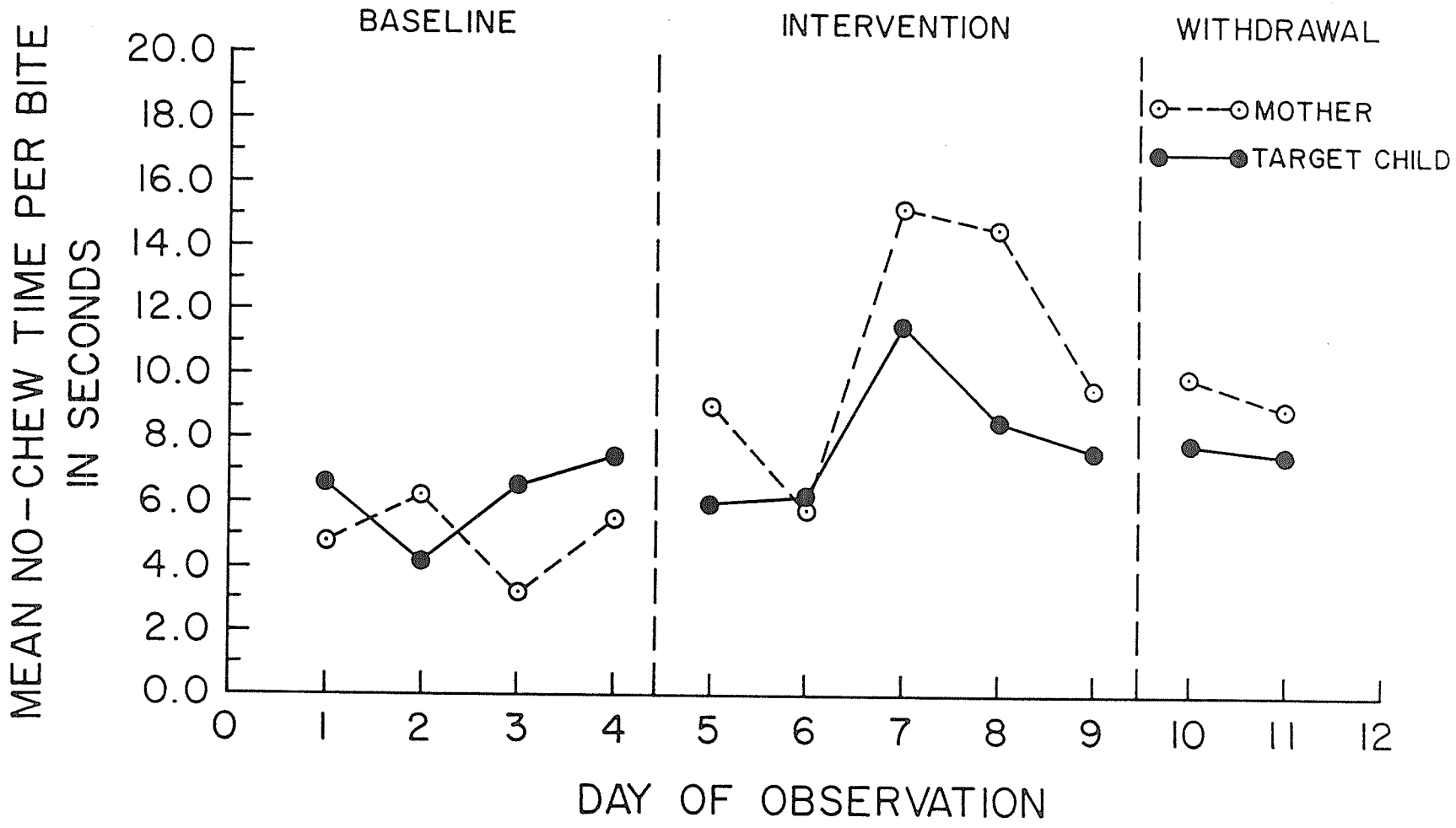

Figure 9. Mean no-chew time per bite versus day of observation for family 1.

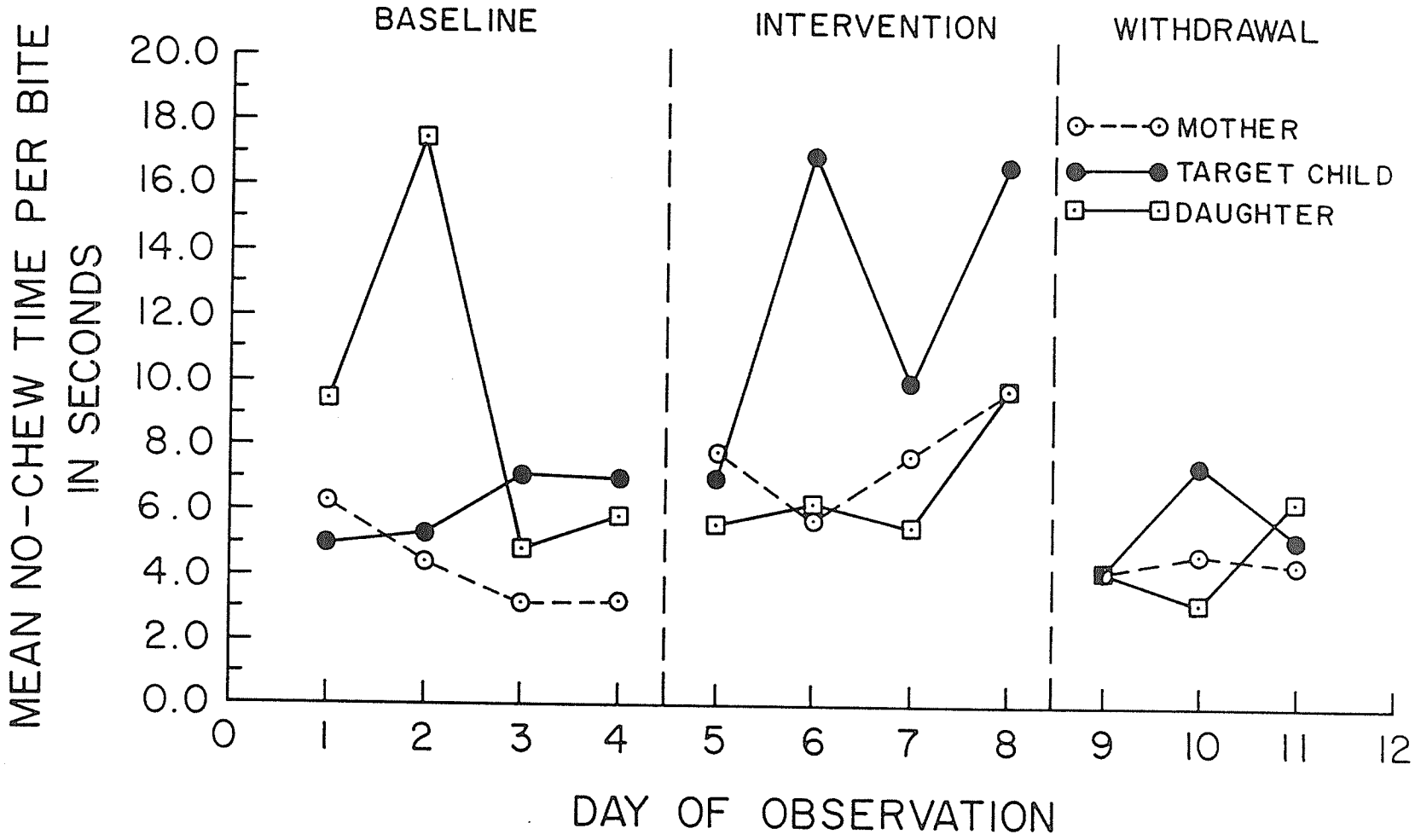

Figure 10. Mean no-chew time per bite versus day of observation for family 2.

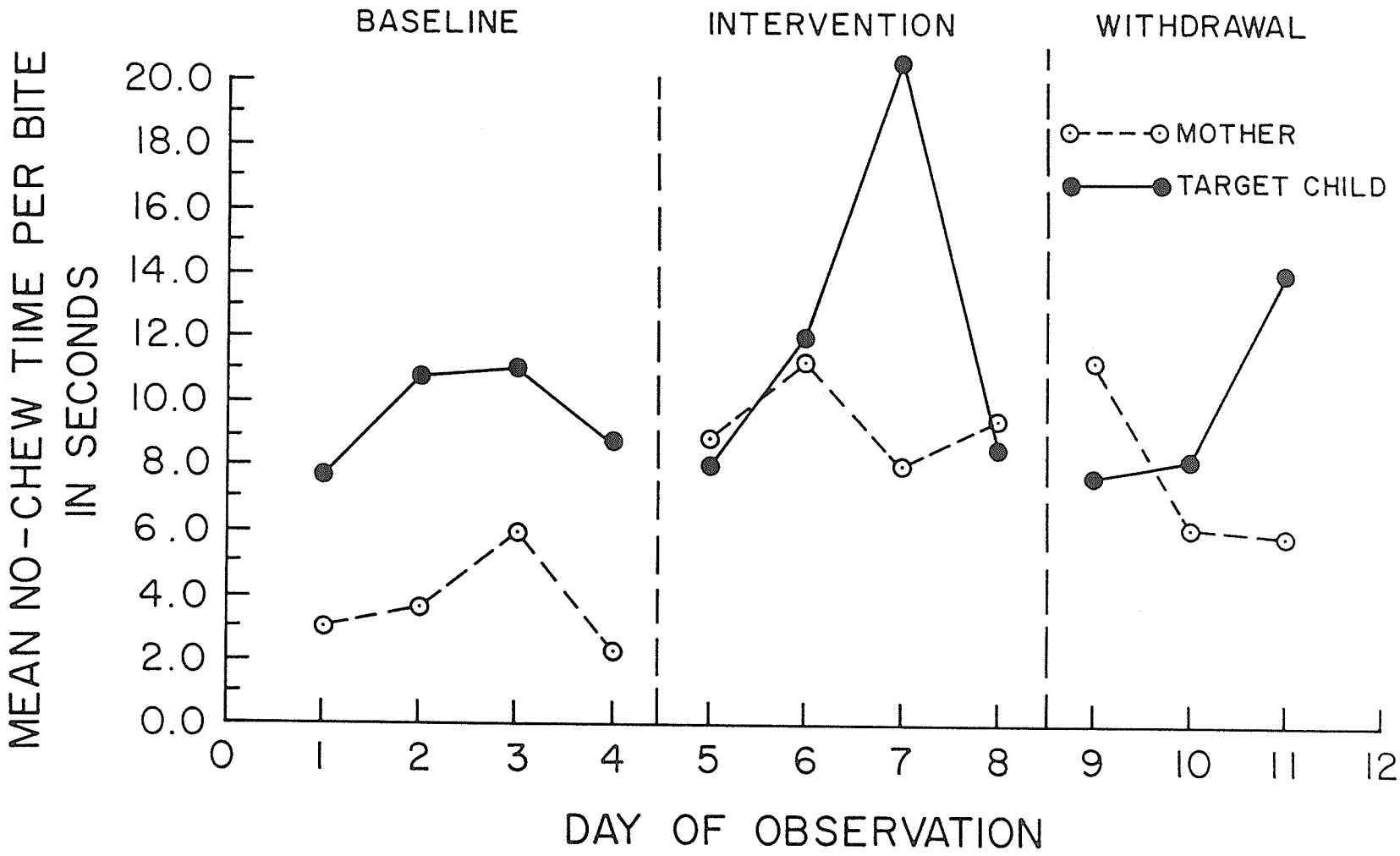

Figure 11. Mean no-chew time per bite versus day of observation for family 3.

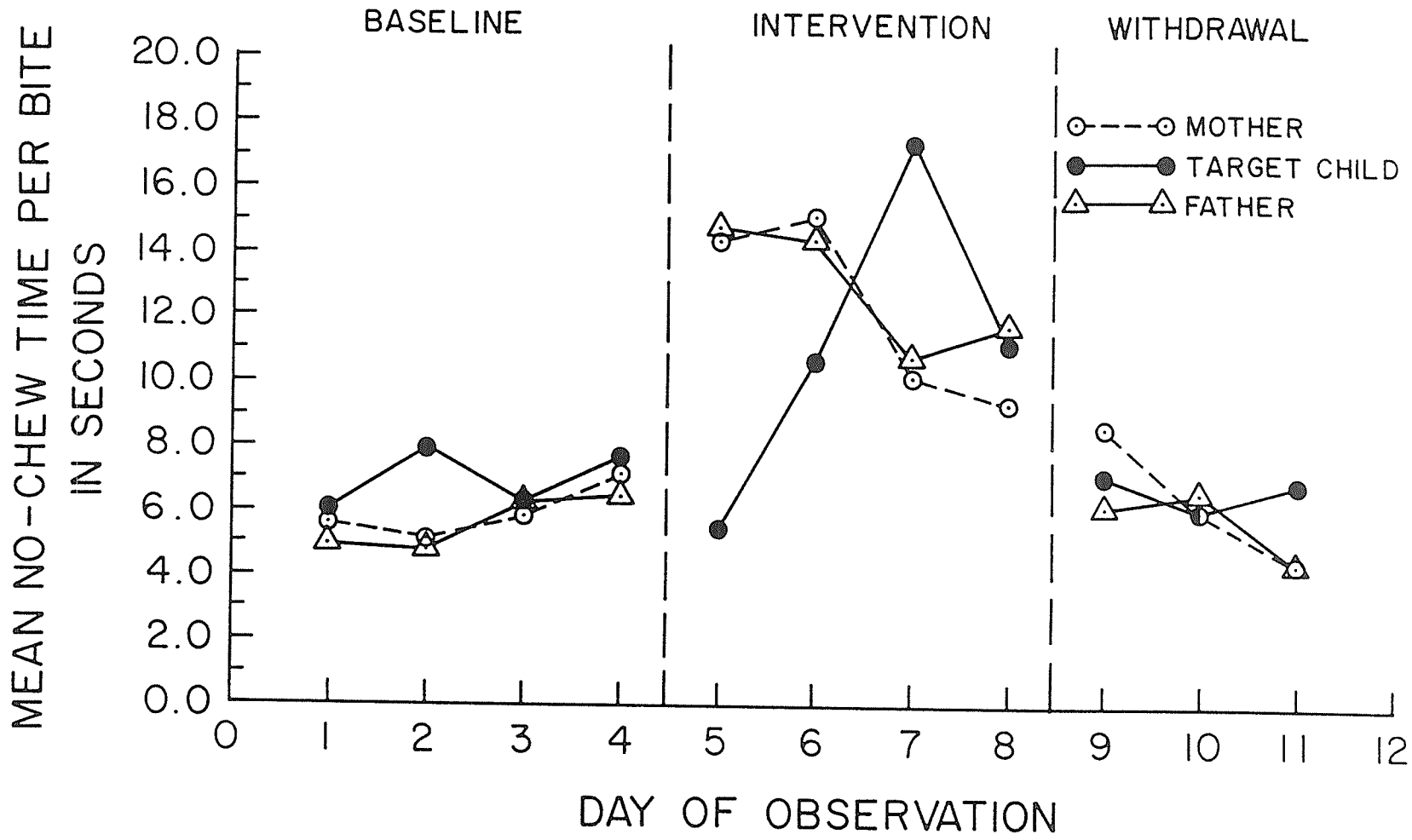

Figure 12. Mean no-chew time per bite versus day of observation for family 4.

This indicates that during the intervention phase, the parents and target children were spending more time not engaged in chewing or biting activity, relative to the baseline and withdrawal phases. No-chew time includes drinking time, and time engaged in non-eating activities such as talking and wiping one's mouth. Although time spent drinking was not measured, the number of drinks per bite exhibited a slight increase and subsequent decrease from baseline to intervention to withdrawal for only three of the target children (see Tables 4 to 7). It is therefore unlikely that increased drinking behaviour accounts for all of the observed increase in no-chew time, especially since one of the children whose no-chew time changed the most dramatically from phase to phase (family 4) exhibited a fairly steady drinks/bite rate throughout. Two of the target children (families 2, 4) also exhibited a pattern of increase then decrease from phase to phase in their mean chew time per bite.

These results indicate that during the intervention phase both the parents and the target children placed their forks down more often, ate more slowly, chewed their food longer, and spent more time engaged in non-eating activities than they did during the baseline and withdrawal phases.

Calories per meal. There were no consistent changes in the calories consumed per meal from one phase to the next for any of the family members. Rather, as the data in Ap-

pendix L suggest, calories per meal varied greatly from day to day. This measure was highly dependent on the types of foods consumed, and since there was no control over this variable, no conclusions about the effect of the intervention on the calories consumed are possible.

Contradictory Messages Questionnaire

Twenty-two of the 26 response patterns reflecting the four contradictory messages (see Appendix K) were identified in this sample of children[2] (n=4). The nonobese sibling of target child 2 exhibited the fewest number of response patterns reflecting the contradictory messages. The response patterns exhibited by each child are found in Table K.2 (Appendix K).

The most frequent response patterns identified were numbers 18, 22, and 23. These indicate respectively that: (a) parents are communicating to their children that it is bad for someone to be overweight, while they themselves are perceived by their children as being overweight; (b) the child's peers often tease other children for being overweight, yet the child is given opportunities to go places to eat with his/her peers; and (c) while the child's peers tease other children for being overweight, they frequently offer the child things to eat.

---

[2] The youngest target child (age 4 yr 6 mo) was not administered the questionnaire because he was unable to fully understand the items.

The four contradictory messages and the number of response patterns identified in this sample which reflect each message are presented in Table 8. These results suggest that each of the contradictory messages was present to some degree in the environment of the children in this sample. The most common messages reflected by the response patterns were message A=2 ("Food is splendour, fat is ugly--but not entirely so") and message B=3 ("Eat to be friendly, but best friends aren't fat").

Table 8

Number of response patterns exhibited by sample children[a] reflecting each of the contradictory messages

Message	Total number of response patterns supporting each message
B-4	2[b]
A-1	18[c]
A-2	5[d]
B-3	9[e]

[a]The sample consisted of target children 1, 2, and 3 (all obese) and the non-obese sibling of target child 2. Target child 4 was not administered the questionnaire because he was too young (4 yr 6 mo).

[b]Maximum = 8.

[c]Maximum = 60.

[d]Maximum = 12.

[e]Maximum = 24.

Discussion

In response to a series of studies by Geller, Keane and Scheirer (Geller et. al., 1981; Keane et. al, 1981) which concluded that the development of techniques designed to modify children's eating habits would seem to be a valid treatment approach with reasonable empirical support, this study intended to explore the efficacy of one specific technique--observational learning. This was accomplished by examining the extent to which obese children modeled changes in their parents' eating behaviours. It was predicted that an increase in the rate at which a parent placed his/her fork down between bites would be matched by a similar increase in his/her child's fork placing behaviour. It was further suggested that any changes exhibited by a parent in other observed consummatory behaviours would be matched by similar changes in his/her child's consummatory behaviours.

The data demonstrated that marked changes in several eating behaviours exhibited by the parents were matched by similar, but much less dramatic changes in the eating behaviours of each of the target children. Specifically, when parents increased their fork placing behaviour during the intervention phase, the mean fork placing behaviour of the target children increased between 40 and 286%. Decreases in

eating speed and increases in no-chew time by the parents during the intervention phase were also exhibited by the target children. When the intervention was withdrawn these changes were reversed for both the parents and the target children. In addition, when two of the parents failed to return to near a baseline level of fork placing during the withdrawal phase, their children also did not return fully to their baseline levels. These results suggest that the observed alterations in the eating behaviours of the target children were the result of them having modeled their parents' eating behaviours.

A third prediction, that increased fork placing behaviour would be associated with a decrease in eating speed, was supported by the data. All of the parents and target children exhibited a decrease in bites per minute and an increase in inter-bite interval when they increased their fork placing behaviour. It was not possible to assess whether this resulted in decreased consumption since there was no control over the type and character of the meals served. It is left for further, controlled studies to assess whether slowing an individual's eating rate will reduce intake. Currently, the research in this area is equivocal. An important finding of this study was that for the short period during which the parents participated compliance with the experimenter's instructions to place their forks down between bites was very satisfactory. An equally important

finding was that the caloric intake of the parents and their children was highly influenced by many other factors (besides their eating rate). It may be that the effect of fork placing behaviour on an individual's food intake is negligible in the face of other multiple factors which exist in an individual's natural environment.

Several points are worth noting with respect to the overall results. First, the observed modifications in the eating behaviours of the target children were modest in comparison to the marked alterations in their parents' behaviours. One possibility for the small effect size observed is that the duration of each child's exposure to the model was brief. It is conceivable that merely exposing a child to a model engaging in a new eating behaviour for four or five days is unlikely to cause the child to drastically or permanently alter eating habits which he/she may have developed over a period of several years.

A second point worth noting is that the youngest target child (4 yr 6 mo) exhibited the largest change in fork placing behaviour during the intervention phase, while the smallest changes were exhibited by the two oldest target children (10 yr 3 mo, and 9 yr 4 mo). Although a definitive conclusion can not be drawn from this limited sample, these observations tentatively suggest that age may be an important factor affecting the extent to which a child models his/her parent's eating behaviours. It is further noted

that the same child exhibiting the largest effect was the only child exposed to two models (mother and father). This observation is consistent with the modeling literature (Bandura, 1969) which suggests that multiple models may enhance observational learning effects.

Finally, the effects of the intervention on the one nonobese child in this study merit further discussion. The changes exhibited by the nonobese child from baseline to intervention on measures of fork placing behaviour, eating speed, no-chew time per bite, and drinks per bite were inconsistent with the notion that she modeled her obese parent's eating behaviours. Although no firm conclusions can be drawn from a single case, this does suggest that further inquiries into the association between a child's eating behaviour, his/her parent's eating behaviour, and the child's degree of obesity, would be useful.

Conclusions

Several conclusions can be drawn from this study:

1. The results tentatively suggest that obese children modeled their obese parent's eating behaviour over a short period of time (4-5 days). The effect was modest and restricted to the target behaviour (fork placing), eating speed (bites/min. and inter-bite interval), and no-chew time. Changes in other measures were inconsistent.
2. The age of the target child and the number of models may have been important factors influencing any modeling effects. The results tentatively suggest that modeling effects were strongest when: a) the target child was relatively young; and b) two parents (rather than one) modeled the target behaviour.
3. Not all children modeled their parents equally.
4. The data suggest that one useful line of research might be to vary the obesity of both the parent and the child in order to ascertain if modeling effects are influenced by the degree of similarity (or dissimilarity) between a child's obesity and his/her parent's. This derives from the observation that the one nonobese child in this study did not model her

obese mother, while the same parent's obese child did exhibit modeling effects.

5. Eating behaviour was observed to be highly variable in two ways. First, individuals exhibited wide variations on the number of different measures of eating behaviour from day to day. Second, there were large differences between subjects. In accordance with Stunkard and Kaplan (1977) it appears that a number of environmental variables may influence eating behaviour. One variable found to have a strong influence on eating behaviour in this study was the type of food eaten. Future studies must recognize the influence of environmental factors on eating behaviour.
6. Instructing individuals to place their forks down between bites appears to be an intervention likely to elicit high compliance over a short time period. This behaviour may be associated with an increase in chews per bite, chewing time, no-chew time, and drinking behaviour.

The first four conclusions add to the growing body of research which has indicated that childhood obesity is influenced by factors in a child's family environment. One such factor may be parental eating behaviour. This suggests that parental modeling may be a useful strategy for altering the eating behaviour of obese children. There are two advantages of utilizing observational learning paradigms in which

family members serve as models. First, such strategies can be employed in the client's natural environment. Second, they necessarily require the participation of the client's significant others. There is now evidence that the participation of significant others in obesity treatment programs may facilitate long term effectiveness (Brownell, Heckerman, Westlake, Hayes & Monti, 1978; Israel & Saccone, 1979; Pearce, 1980). Copeland and Baucom-Copeland (1981) go so far as to suggest that all treatments of childhood obesity would be enhanced by focusing on the entire family using a systems approach. They recommend a thorough assessment of all possible contributing factors to the child's obesity, including the family's interactional role in its maintenance.

The observation that eating behaviour is highly variable and influenced by a number of factors suggests that parental eating behaviour alone may have only a minimal effect on a child's eating habits. This conclusion is supported by the relatively modest changes in the eating behaviours of the target children observed in this study, compared to the rather dramatic changes in their parents' eating behaviours. The effects of parental modeling over extended periods, and the durability of modeling effects remain to be examined. It is suggested that modeling procedures might be most useful as part of a more comprehensive program designed to teach young children good eating habits. Such a program,

for example, could include teaching parents to alter their eating behaviours as well as providing them with information on nutrition.

Future research could also examine the efficacy of including an instructional component for target children in addition to a parental modeling component. The observation that parents were very compliant when instructed to place their forks raises the possibility that similar instructions to children may also be effective. As mentioned previously, Epstein et. al. (1976) found that instructions to school children to place their forks between bites, and instructions plus praise, decreased the childrens' bite rate and food consumption. It may be that the modest modeling effects observed in this study could have been enhanced by providing target children with direct instructions as to the target behaviour. Future studies could examine the relative efficacy of modeling, instructional, and praise components by utilizing, for example, a multiple baseline design similar to the one used by Epstein et. al. (1976).

The eating behaviour of a child's parents is only one possible factor which may contribute to his/her eating habits. The results of this study clearly indicate that this is an area worthy of further inquiry. More specifically, there now appears to be reasonable support for a systematic series of investigations designed to assess the scope, generality, and clinical utility of training parents as models to modify the eating behaviours of obese children.

Literature Review

The Behavioural Control of Obesity: An Overview

Behavioural methods are currently hailed as the most effective and promising means of treatment for mild and moderate obesity (Stunkard & Kaplan, 1977). Behavioural treatments have consistently produced greater weight loss than a variety of non-behavioural treatments (Brownell & Stunkard, 1978a).

Research on the behavioural treatment of obesity has proliferated at an explosive rate since Ferster, Nurnberger and Levitt's classic paper on the control of eating (1962). One of the most important contributions of this conceptual paper was its emphasis on stimulus control. It recommended a detailed analysis of antecedent discriminative stimuli for eating to be followed by manipulations of these stimuli in order to remove environmental cues which might elicit eating behaviour. This emphasis on stimulus control was only one of several techniques which they described as "avenues of self-control". Other avenues included making the overeater aware of the ultimate aversive consequences of overeating, scheduling eating to occur at given intervals and specific times of the day (temporal control), scheduling eating to occur in situations not associated with other normal activi-

ties, strengthening prepotent activities which would be incompatible with eating, and using the concept of chaining to modify the eating response. They suggested that eating is a rough designation of a chain of behavioural sequences which may begin as early as dressing to go to the grocery store, and which culminates in swallowing, and gastrointestinal reflexes. They recommended lengthening the chain by arranging that foods available or accessible require a certain amount of locomotion or preparation. By increasing the length of the chain they argued that the disposition to start the chain would be weaker. Another technique based on the concept of chaining was to attempt to disrupt the chain, or lengthen it at the latter points during actual eating. This was based on the assumption that many eaters carry out the sequence of placing food in the mouth, swallowing, and reaching for more food very quickly, and suggested that many obese people eat at a much higher rate than normal eaters. To reduce the rate of eating they suggested several simple exercises such as placing more food on the fork only after swallowing, holding food on the fork for a short period of time before inserting the food in the mouth, and prolonging chewing.

An important advance in obesity treatment was the recognition by Ferster et. al. that long term maintenance of weight loss may require the development of proper eating habits which will continue to exist after the individual has lost weight and left the treatment. They stated that:

> The central issue is the development of self control in eating which will endure and become an available part of the individual's future repertoire. Most conventional programs do not focus on the eating patterns available to the subject after he has lost weight, nor do they present recognizable techniques for developing such future control. (p. 325)

They further wrote that self-control of eating behaviour must be developed in gradual steps over a period of time.

These recommendations gave rise to a fresh new direction in obesity treatment which was in contrast to more traditional strategies which embraced short term diets, drug, and medical treatments as the preferred mode of intervention. Unfortunately, this influential paper was weakened by an absence of data.

Five years after the publication of Ferster, Nurnberger and Levitt's cornerstone paper, Richard B. Stuart (1967) published what is considered by many to be the seminal work in this area. Adapting Ferster et. al.'s stimulus control procedures with clinical refinements, Stuart treated eight overweight women. Weight loss over 12 months ranged from 29 to 47 lbs. These weight losses were impressive, although it was not clear whether the patients reached their desired weight goals, and the study lacked a long term followup after the termination of formal treatment. Despite these shortcomings, this study still represents some of the best results for the treatment of obesity to date.

The first controlled study of these methods was conducted by Harris (1969). She assigned 24 men and women who were at

least 15 lbs. overweight to either an experimental group or to a control group. The experimental groups received training in the concepts of reinforcement, analysis of stimuli governing eating behaviour, and slowing the rate of eating. Treatment was conducted on a group basis. All subjects involved in the program achieved a stable weight loss, and the mean loss of the experimental subjects was significantly greater than the loss shown by the control group subjects.

Wollersheim (1970) conducted an ambitious study in terms of detailed procedures, exhaustive data analysis and experimental design. Her experiment involved 79 overweight female students who were observed for 18 weeks of baseline, 12 weeks of treatment, and 8 weeks of followup. Subjects were assigned to one of four conditions: (a) positive expectation - social pressure; (b) nonspecific therapy (an analogue of traditional psychotherapy); (c) focal therapy based upon major learning principles; (d) a no-treatment waiting-list control group. All three treatment groups outperformed the waiting-list control group, and the focal therapy group was superior in both weight reduction and reduction of reported frequencies of various eating behaviours at post-treatment and followup. Wollersheim's study was one of the first group psychotherapy studies concerning weight reduction designed with the controls necessary to attempt to establish cause-effect relationships between the therapeutic techniques and treatment outcome. Since the focal treatment group

represented a treatment "package" it was not possible to specifically delineate the more potent elements of this package.

Penick, Filion, Fox and Stunkard (1971) compared behaviour modification techniques with group psychotherapy in a clinical setting. The 32 subjects were seen in a day hospital program. An attempt was made to equalize experimenter expectancies by using an internist undergoing psychiatric residency with long experience in the treatment of obesity and great skill in group psychotherapy as the leader of the group psychotherapy condition, while the leader of the behaviour modification condition was an experienced experimental psychologist. The behavioural program involved self-monitoring of eating, stimulus control, reinforcement, and the development of techniques to control the act of eating. These techniques included counting each mouthful of food eaten during a meal, and placing utensils on the plate after every third mouthful until that mouthful was chewed and swallowed. In terms of weight loss, the superiority of the behaviour modification condition over the psychotherapy condition was clearly demonstrated. The results were among the best reported for any treatment, with 13% of the behaviour modification patients losing more than 40 lbs. (versus 0% for the psychotherapy patients), and 53% losing more than 20 lbs. (versus 24%). The average weight loss reported in the medical literature at that time was 5% (weight loss greater

than 40 lbs.), and 25% (weight loss greater than 20 lbs.). Weight losses continued or were maintained at three and six month followups with the behaviour modification condition continuing to be superior. These results were quite remarkable, although the authors noted that there was considerable variability in the response of the patients to the behavioural treatment.

One of the major goals of the above studies was to enhance the subject's "self-control" of eating through the use of stimulus control, slowing the act of eating, self-monitoring, and other behavioural techniques. The following studies attempted to compare the efficacy of self-control techniques to external control techniques such as therapist reinforcement for weight loss or behaviour change.

Hall (1972) utilized a single-subject design to compare self-control, consisting primarily of Ferster et. al.'s (1962) stimulus control procedures, and therapist control, consisting mainly of reinforcing the subjects with monetary rewards for weekly weight loss. Although both treatments produced weight loss, the therapist control condition resulted in greater weight losses than the self-control condition. A two year followup (Hall, 1973) indicated that none of the subjects were able to maintain their weight losses.

Romanczyk, Tracey, Wilson and Thorpe (1973) conducted a component analysis of self-monitoring of weight and calorie intake, self-control procedures, monetary rewards, aversive

imagery, and relaxation training. They concluded that the self-control procedures were more effective than the no-treatment control or the self-monitoring of weight groups. One of their major findings was that self-monitoring of calorie intake in the absence of therapist contact was an effective method of producing weight loss. In a second study reported in the same article, they again found that self-monitoring of calorie intake was effective; however, they also found that the addition of other self-control methods resulted in a statistically significant greater treatment effect than that obtained with self-monitoring alone. This difference was maintained at a three and twelve week followup, with the subjects receiving the full therapy package showing increasingly greater weight reduction from post-treatment to the second followup. They interpreted this as indicating that the self-control subjects had learned behavioural skills which they were able to implement on a continuing basis.

Mahoney, Moura and Wade (1973) compared the relative efficacy of self-reward, self-punishment, and self-monitoring techniques for weight loss. They found that after four weeks of treatment, the self-reward subjects had lost significantly more weight than either the self-monitoring subjects or the self-punishment subjects. The improvement in the self-reward group was maintained at four months, although attrition was high. In a subsequent study, Mahoney

(1974) again analyzed the relative effects of self-reward for weight loss, self-reward for habit improvement, and self-monitoring. He set out to answer two basic questions: (1) will self-reward enhance self-monitoring and goal setting in weight control, and (2) are self-rewards more effective when tied to changes in eating habits rather than to changes in body weight? Although all three treatment groups lost some weight, several important differences are worth noting:

1. Of the three groups, only the subjects in the group which self-rewarded themselves for eating habit changes (SR-Habit) lost a significant amount of weight during the treatment.
2. At the one year followup, the SR-Habit subjects were superior (70% maintenance or improved weight losses versus 40%, 37.5%, and 40% for the SR-Weight, self-monitoring, and treated control subjects).
3. SR-Habit subjects exhibited the fewest inappropriate eating habits (based on self-report data).
4. There was a significant relationship between the degree of habit change and the magnitude of weight reduction. Specifically, weight loss was inversely proportional to success in eliminating inappropriate eating habits.
5. Subjects in the SR-Habit group reported a higher motivation to lose weight than subjects in the other groups.

6. There was no relationship between pre-treatment eating patterns and subsequent weight loss.

Mahoney concluded that there were thus several lines of evidence indicating that the superior results of the SR-Habit group were mediated through alterations of eating styles, and suggested the need for more research on the pre-treatment assessment of eating styles.

Castro and Rachlin (1980) compared self-reward, self-monitoring, and self-punishment while balancing the salience of feedback in these three conditions. They noted that no studies to that point had attempted such a balance. They tried to duplicate Mahoney's (1974) self-reward condition. A balance of feedback salience was attempted in the following way. The self-reward group took money as a reward for weight loss. For the self-punishment group, the punishment was exactly opposite the reward; whenever the self-reward group took money, the self-punishment group gave money. The self-monitoring group was asked for fixed payments not contingent upon weight loss. The purpose of the study was to question the significance of studies that purport to show that self-reward has a greater effect than another equally salient feedback stimulus. They found no differences in treatment effects among the three groups. This was in contrast to earlier studies that had demonstrated the superiority of the self-reward condition (Mahoney, 1974), and Castro and Rachlin questioned the belief that self-reward is a more

effective procedure than self-monitoring or self-punishment. They suggested that the differences found in earlier studies may have been a function of salience of feedback stimuli rather than locus of reinforcement.

Another more obvious difference between Mahoney's (1974) study and Castro and Rachlin's study was that Mahoney's successful self-control subjects rewarded themselves for habit change while conditions in the latter study made reward (or punishment) contingent on weight loss. It is puzzling that Castro and Rachlin overlooked this difference, especially since the importance of rewarding eating habits rather than weight loss was emphasized in Mahoney's discussion.

There was thus increasing evidence supporting the relative efficacy of self-control techniques for weight loss, particularly as a strategy for facilitating durability of treatment effects. To this point however, only Hall (1972) had directly compared self-control techniques to external (therapist) control. She used a single-subject design and found that the superiority of the self-control condition was not maintained at a two year followup.

Jeffrey (1974) conducted a larger scale study to explicitly compare the relative efficacy of external-control and self-control procedures on both the production and maintenance of weight loss. His findings demonstrated that while the self-control and external control treatment conditions were equally effective in producing weight reduction, the

self-control conditions were more effective in promoting maintenance of weight loss. He concluded that the differences in maintenance between conditions could best be accounted for by the locus of reinforcement control.

Jeffrey's results were contrary to Hall's (1972) findings. In a more recent study, Hall, Hall, Hanson and Borden (1974) compared the relative efficacy of two self-management treatments, a nonspecific treatment and a no-treatment control condition. They found that the short term treatment and followup (three month) successes of the self-management conditions disappeared at the six month followup and long term weight losses were not maintained. The negative findings of Hall's studies question the assumption that self-control techniques facilitate maintenance of treatment effects relative to other treatments.

The following conclusions can be drawn from the above studies (Jeffrey, 1977):

1. Self-monitoring of weight appears to have only temporary effects on weight reduction (Stuart, 1971), and self-monitoring of eating habits has some therapeutic effects (Romanczyk et. al., 1973). Self-monitoring is most valuable as a method of obtaining information on the patient's eating habits essential for implementing a treatment program.
2. While self-control techniques appear to be as effective as external-control techniques in producing

weight loss during treatment, they seem to be more effective in facilitating short term maintenance of treatment effects. The results of studies which have assessed the long term maintenance of weight loss as the result of self-control techniques, however, have been equivocal.

3. There is considerable variation in the response of individuals to behavioural treatment programs for obesity (Penick et. al., 1971).
4. Treatments which place stimulus control and reinforcement contingencies on the target behaviours of eating (and exercise) rather than weight loss are more effective.

The studies reviewed so far are fairly representative of the development of one of the more promising strategies for behavioural control of obesity--environmental planning and self-control or self-management. There are, however, several other trends that have developed in the behavioural research for treating obesity. These are: aversive techniques, covert sensitization, coverant conditioning, and therapist reinforcement techniques (Foreyt, 1977a). Each of these techniques has been applied and tested separately and in combination. A comprehensive review of each of these areas is not possible in this space. Rather, a brief overview follows, supplemented by the findings of some excellent reviews of these techniques.

Aversive techniques. While aversive techniques received some attention in the 1960's and early 1970's, they are presently unpopular as a technique for weight control. Several papers have investigated the efficacy of aversion therapy for the treatment of obesity (Foreyt & Kennedy, 1971; Fronwirth & Foreyt, 1978; Kennedy & Foreyt, 1968; Meyer & Crisp, 1964; Morganstern, 1974; Rachman & Teasdale, 1969; Stollak, 1967; Thorpe, Schmidt, Brown & Castell, 1964; Wolpe, 1954). The following conclusions can be drawn from these papers. Scattered successes with individual cases and groups have been reported (Foreyt & Kennedy, 1971; Kennedy & Foreyt, 1968; Meyer & Crisp, 1964; Morganstern, 1974; Wijesinghe, 1973) In general the results of aversion therapy have been poor (Foreyt & Frohwirth, 1977) and marked by high attrition and many cases of complete failure (Frohwirth, 1977). It has been suggested that aversion therapy may be useful only as an adjunct to other specific techniques (Foreyt & Kennedy, 1971). In reviewing the status of aversion therapy as a means of treating obesity, Frohwirth (1977) concluded that these techniques could not be recommended for general application.

Covert sensitization. Reviewing several studies utilizing covert sensitization for the treatment of obesity (Cautela, 1972; Diament & Wilson, 1975; Foreyt & Hagen, 1973; Janda & Rimm, 1972; Maletzky, 1973; Manno & Marston, 1972; Murray & Harrington, 1972; Sachs & Ingram, 1972) Hagen

(1977) concluded that although the theoretical rationale upon which covert sensitization is based has been seriously challenged, as a treatment technique with a great deal of placebo effect it appears as effective as any technique. He suggested that consideration should be given to this technique as an adjunct to other procedures. He recommended further research, specifically to investigate the importance of subject and therapist expectations.

Coveramt conditioning. In a summary of studies investigating the efficacy of coverant conditioning as a means of treatment for obesity, Foreyt (1977b) stated that this technique has yet to demonstrate its effectiveness at producing weight loss. Reported weight losses have been minimal, and followup data is lacking. He concluded that no definitive statements can be made about the efficacy of this technique. Presently, it appears that coverant conditioning is too weak to be of use by itself, it is ineffective with most individuals, and it is not known whether the short term weight losses that have been reported were due to nonspecific, placebo variables, or whether losses were maintained.

Therapist reinforcement techniques. The next series of studies involves the use of operant reinforcement or punishment techniques administered by a therapist to effect weight loss. Most of these techniques reinforce weight loss and/or punish weight gain. Many were carried out in institutions with patient populations allowing the therapist extensive

control of reinforcers (e.g., Bernard, 1968; Klein, Steele, Simon & Primavera, 1972; Moore & Crum, 1969; Upper & Newton, 1971). Most studies in this area reported impressive weight losses (e.g., Harmatz & Lapuc, 1968; Jeffrey, Christensen & Pappas, 1973; Moore & Crum, 1969). There are, however, several important problems in utilizing this technique that need to be considered. The first one involves the extent of control the therapist is able to achieve over the patients. Many of the studies using therapist reinforcement were carried out in institutions or restrictive environments such as summer camps (Dinoff, Rickard & Colwick, 1972) or daycare centres (Foreyt & Parks, 1975) where the therapist could exert a great deal of control over reinforcers dispensed to the subjects. It is unlikely that such control could exist outside of these restrictive environments, thus making it difficult to apply these techniques properly to out-patients and non-patient populations.

The second problem arises as a result of the technique itself. These studies have generally focused almost exclusively on reinforcing weight loss and punishing weight gain without giving any attention to teaching subjects how to effectively achieve weight loss. This has led in some cases to extreme measures by subjects to lose weight rapidly and temporarily in order to avoid punishment or gain rewards. Mann (1972) reported that patients often resorted to laxatives, diuretics, and vigorous exercise just prior to

"weigh-ins". Not only are such actions unhealthy, but it is unlikely that such behaviours will lead to permanent and stable changes in eating habits. This point is supported by the research reported earlier on self-control techniques which indicated that focusing on rewarding changes in eating habits rather than rewarding weight loss seemed to facilitate maintenance of positive treatment effects (Mahoney, 1974). The followup data for therapist reinforcement techniques is consistent with this argument. Although few studies reported any followup data at all, those that did presented equivocal results (Foreyt, 1977c). Failures to maintain losses are not be surprising considering the extent of the therapist's control was highly dependent upon the patients remaining in the program and in the restrictive environment, and the patients typically were not taught effective, durable ways of achieving and maintaining weight loss. Foreyt (1977c) concluded that the most difficult problem to overcome with these techniques is their inability to generalize from the institution to the natural environment.

Summary and conclusions. Since the publication of Ferster et. al.'s (1962) primarily conceptual paper, and Stuart's (1967) relatively successful report of the application of behavioural methods for weight control, the behavioural treatment of obesity has received widespread attention, and a variety of techniques have been applied and subjected to scientific inquiry. In spite of early success-

es in the field, the results of subsequent studies were varied and disappointing.

Prior to the widespread application of behavioural techniques to weight control, Stunkard and McLaren-Hume (1959) reviewed the area of obesity treatment. On the basis of only eight studies that they considered to be interpretable, they concluded that "the results of treatment for obesity are remarkably similar and remarkably poor" (p. 80) and that "a majority of persons regain a majority of pounds lost"(p.81). With the exception of one study, no author had reported even the modest success of a 20 lb. weight loss in more than 29% of the patients, and an average of only 5% lost 40 lbs. or more. The results of one of their own studies were even poorer.

With the increasing application of behaviourally based treatments over the next 15 years, subsequent reviews offered more positive conclusions. Abramson (1973) reviewed 40 case reports and experimental studies of behavioural approaches to weight control including aversive conditioning, covert sensitization, coverant conditioning, therapist reinforcement of weight loss, and self-control methods. The only techniques able to consistently demonstrate their utility for producing weight loss were therapist controlled reinforcement and self-control methods. In accordance with Foreyt (1977c) Abramson argued that therapist controlled reinforcement has many problems with respect to maintenance

and the practical difficulties applying the technique outside of institutional settings. He concluded that self-control techniques hold the most promise because specific skills are taught to control eating behaviour. Regarding maintenance, he concluded that the focus should be on altering eating habits rather than on reinforcing weight loss. Among his suggestions for further research, Abramson suggested involving the patient's family in treatment programs in order to provide the subject with support and reinforcement for program adherence. In a more recent, updated review Abramson (1977) concluded that "it is not premature to conclude that self-control is the most effective treatment for obesity currently available"(p. 360).

Hall and Hall (1974) reviewed the literature with emphasis on research design and methodological considerations. They too concluded that self-managed techniques showed the most promise for effective long term weight loss and advocated an increased emphasis on procedures which would enable subjects to maintain weight losses following treatment contact.

The importance of treatments which emphasize teaching persons to permanently alter their eating habits (a means of self-control) has been recognized in several reviews (Abramson, 1973, 1977; Jeffery, Wing & Stunkard, 1978; Leon, 1976; Stuart, 1975; Stunkard & Mahoney, 1975) as a means of promoting maintenance of treatment effects. Leon (1976) concluded:

> The relatively greater effectiveness of behavioural management and environmental control procedures in the maintenance of weight loss may be related to the specific emphasis placed on learning how to permanently change one's eating patterns. (p. 575)

In a recent, fairly extensive review of behavioural obesity research, Wilson and Brownell (1980) attempted to evaluate treatment outcome of behaviour therapy for obesity. Their review was in response to negative conclusions drawn by others who have stated that obesity treatment is an example of a failure for behaviour therapy (Yates, 1975), weight losses achieved by behavioural treatments are not maintained (Stunkard & Penick, 1979) and all forms of treatment for obesity are ineffective.

Wilson and Brownell drew the following conclusions. The average weight loss at post-treatment was 10.4 lbs., and while this weight loss is small, it is consistent with the goals of most behavioural programs -- that is, a gradual weight loss of one or two pounds a week. While weight loss was poorly maintained in many studies, the results of some studies have been encouraging, some treatments have clearly produced weight loss that is maintained at a one year followup, and Hautzinger (1980) has recently reported fairly encouraging results at a three year followup. Unfortunately, even when weight loss was maintained, most subjects did not continue to lose weight after the termination of treatment. Further, maintenance beyond one year has generally been unsatisfactory. Treatments that were most successful in pro-

ducing good maintenance often involved significant others or family members in the program.

Because of the paucity of well controlled studies, the long term comparative effects of behaviour therapy for obesity cannot be determined at this point. Wilson and Brownell also concluded that a recurring feature of behavioural programs has been marked inter-individual variability in outcome. They suggested that this is because the critical variables governing weight loss have yet to be identified. Some more positive conclusions they made were that behaviour therapy has dramatically decreased attrition from treatment programs, compared to other forms of treatment, and that behaviour therapy for obesity has produced no negative side-effects.

While they conceded that the optimal treatment format has yet to be found, they suggested that self-monitoring, self-reinforcement, cognitive-behavioural methods, exercise, and programs which focus on the interpersonal context in which eating occurs show some promise. Techniques focusing on stimulus control and eating topography have not been reliably linked to weight loss, and further research on these techniques is required. With respect to outcome measures, they suggested looking beyond average group outcome figures to the effects of treatments on individuals. Discussing the future of behavioural treatment programs for obesity they asserted that:

> The development of self-regulatory functions, which enable individuals to identify variables that influence their weight and to implement corrective, self-controlling actions when necessary, is essential to long-term maintenance of weight reduction. (p. 76)

They suggested that the development and maintenance of such self-regulatory behaviour requires social support. A primary source of social support can come from the subject's family. A few recent studies have demonstrated that the inclusion of a family member in the treatment process can facilitate maintenance of treatment effects (Brownell, Heckerman, Westlake, Hayes & Monti, 1978; Pearce, 1980).

To summarize, it appears that behavioural treatments of obesity are relatively more effective than previous or other current strategies. Stimulus control techniques have been popular but their value is still questionable since they are usually used in conjunction with other techniques as part of a treatment "package", and little research has been done to isolate and assess specific components of stimulus control strategies. Research investigating the efficacy of altering the eating response will be reviewed in the next section. Externally controlled reinforcement for weight loss has produced dramatic short term weight losses, but these are rarely maintained once the treatment is terminated or when the therapist cannot have fairly extensive control over the reinforcers. Self-monitoring not only produces short term weight loss but also provides valuable information on the individual's lifestyle necessary for the implementation of a

treatment program. Self-control methods hold the most promise, and maintenance of weight loss appears to be enhanced by focusing on altering eating habits rather than focusing on weight loss itself. The present trend is towards teaching individuals to permanently alter their lifestyle by changing their eating and exercise habits in ways that will be maintained once the actual treatment program has terminated, as well as preparing the individual to identify and correct variables which could conceivably cause him/her future weight problems. The adoption of such a strategy requires acceptance that weight loss will be gradual (1-2 lbs. per week) and the treatment period may be long. Unfortunately, this strategy presently offers no guarantees of long term effectiveness beyond one year.

The marked variability between subjects suggests that each treatment program must be tailored to each individual subject. Evaluative research should focus on individuals rather than groups and should report individual data. Research designs particularly well-suited to obesity research are multiple-baseline, interrupted time-series, and single-subject designs.

The involvement of family members in the treatment program has produced promising results, especially for maintenance of effects.

Problems with past research. Unfortunately, in spite of the large number of studies done, a critical analysis reveals that very little can be said about which specific techniques within the behavioural realm are effective and which are not. Few studies are experimentally rigorous, and glaring methodological inadequacies preclude any definitive conclusions about the efficacy of many specific behavioural techniques. As Wilson and Brownell (1980) stated:

> The ultimate outcome question...is what treatment method(s), applied to what problems, in which patients, by what therapists, have what effects on what measure and at what cost. (p. 67)

At present, this question is far from being answered, and this is largely a consequence of problems with the research to date. Stuart (1975) offered several criticisms of the past research in this area. Some of these criticisms are:

1. Failure to measure the impact of interventions on direct, dependent variables (i.e. measuring weight loss, but failing to assess changes in targeted behaviours).

   This is an important criticism which has only recently been receiving attention. Brownell and Stunkard (1978a) raised the question, "Does weight loss in behavioural programs result from the specific changes prescribed in the programs?". At that point only three studies (Hagen, 1974; Mahoney, 1974; Wollersheim, 1970) provided evidence that weight change results from prescribed behaviour change, and these

relied on self-report data. They cited others, including one of Brownell's own (Brownell et. al., 1978) in which behaviour changes were not correlated with weight change. Since then, more studies have evaluated changes in target behaviours as well as weight change. This is important if an effort is to be made to determine which behavioural techniques utilized in a treatment program are the most effective.

2. Problems in experimental design.

To reiterate an earlier point, focusing on individuals as well as groups when evaluating programs provides valuable data. Another problem with using group designs, especially when comparing treatments, has been devising a suitable control group. This is particularly difficult in obesity research since control groups often resemble other behavioural techniques (covert sensitization, systematic desensitization, relaxation), or may appear too fictitious so as to result in attrition. With these considerations in mind, a more productive research strategy might be to initially evaluate obesity treatments using single-subject, multiple-baseline, and/or time-series designs to assess specific techniques with specific individuals. This could be followed by larger scale studies involving more subjects if a technique appears to be effective.

3. Lack of studies using the general population.

Many studies have used mildly overweight college students or institutionalized patients. More attention should be given to those individuals most likely to seek treatment for their obesity.

4. Varying conventions used to report the degree of obesity and outcome.

Typically, life insurance tables have been used to calculate some measure of a person's degree of obesity. The exclusive use of such tables has recently been questioned. Rogers, Mahoney, Mahoney, Straw & Kenigsberg (1980) reported that the use of these tables as a criterion for subject selection or as a factor in outcome assessment may significantly bias both sampling and outcome evaluation. It has been recommended that skinfold measures be used in addition to assess body fat (Franzini & Grimes, 1976; LeBow, 1977a; Rogers et. al., 1980). Bellack and Rozensky (1975) recommended using several measures which provide a maximum of information relevant to the purpose of the study. The use of diverse measures has caused difficulty in comparing studies. It is recommended that many different measures be used including (minimally) a measurement of the proportion overweight based on accurate norms, and a measurement of body fat (triceps skinfold measure) in order to allow comparison between studies.

5. Use of subject as opposed to experimenter-collected data.

This is particularly important when one is attempting to evaluate the effectiveness of a technique for altering an individual's behaviour. Because of procedural difficulties, in many cases the researcher must rely on self-report data. However, in order to accurately evaluate the effectiveness of specific techniques it will be necessary for researchers to collect data on a subject's behaviour from unbiased observers.

6. Lack of standardization of service delivery.

Researchers should provide details of service delivery, either in the publication itself, or upon request, to allow more accurate replication and assessment of their techniques.

In addition, many researchers have focused on evaluating treatment "packages" or designing innovative techniques. Few studies have attempted to isolate and evaluate the specific components of a larger treatment package. Many components assumed to be important have never been thoroughly investigated. Mahoney (1975a) reported that many of the current behavioural strategies for weight control derive from "undemonstrated premises and unexamined assumptions about obese behavior patterns" (p. 418) and calls for more "basic" research into many of the assumptions currently held.

The "obese eating style"

One of the "avenues to self-control" described by Ferster, Nurnberger and Levitt (1962) for controlling eating was to reduce the rate of eating by lengthening and breaking up the chain of events which culminates in swallowing the food. They suggested that many eaters carry out the sequence of placing food on their fork, inserting food into the mouth, swallowing it, and retrieving more food from their plate at a very rapid rate. Several exercises designed to slow this sequence were recommended. Since then, many behavioural programs have included techniques designed to slow the rate of eating either as the primary treatment strategy (e.g., Epstein, Parker, McCoy & McGee, 1976), or, more typically, as part of a larger treatment package (e.g., Coates, 1977; Gross, Wheeler & Hess, 1976; Hall et. al., 1974; Harris, 1969; Penick et. al., 1971; Stuart, 1967; Stuart & Davis, 1972; Wollersheim, 1970). These techniques typically involved instructing obese persons to slow their rate of eating by chewing longer, pausing between bites, placing their fork down while chewing, and other similar tactics. This prescription is based on three assumptions: obese persons eat differently from nonobese persons; the most important difference to consider for treatment purposes is that the obese eat faster than the nonobese; if the obese alter their eating style so that it is similar to the nonobese style, they will eat less, and subsequently lose weight.

The last assumption assumes that slowing the rate of eating will reduce the amount of food eaten. This reasoning is based partly on its intuitive appeal, and partly on physiological studies of the human eating response which suggest that slow eating will postpone a larger proportion of the meal to a time when the absorption of nutrients has begun to produce physiological signals of satiety, adding the effect of these signals to those cognitive ones used in stopping eating (Wooley, Wooley & Dyrenforth, 1979). Wooley, Wooley and Turner (1975) reported that the rate of meal consumption was related to appetite for a palatible food (dessert) one hour after the meal. Appetite was operationalized as salivation elicited by dessert presentation. They concluded that the most likely explanation for their results was that rate of consumption somehow affects lateral hypothalamic function. Further research in support of this assumption is sparse. This is due primarily to the fact that most of the independent variables in behavioural research have been inferred from changes in dependent variables (i.e. weight loss) (Brownell & Stunkard, 1978a; Mahoney, 1975a). Mahoney (1974) assessed behaviour change by having his subjects fill out an Eating Habits Booklet. He reported that targeting eating habits was more effective for weight reduction than targeting weight loss and that altering eating habits resulted in better maintenance of weight loss at followup. More important, he reported a significant correlation be-

tween degree of habit change and weight loss. While this study relied on self-report data, Mahoney asserted that it provided evidence that weight loss can be mediated through alterations in eating style.

Studies focusing primarily on modifying the eating response have, almost by necessity, provided more direct measurements of behaviour changes during treatment. Coates (1977) provided an excellent example of one of the few studies which examined and demonstrated an association between prescribed behaviour changes and weight loss. For example, one subject who lost a significant amount of weight demonstrated changes in rate of eating, eating behaviours, food portions, and food preparation and service. It was not possible from this data however, to determine how important the change in eating rate per se was as a factor resulting in weight loss. Epstein et. al. (1976) found that children's bite rate was easily modifiable using instructions plus praise for slowing the rate of eating by placing eating utensils down between bites. More important, this modification resulted in a significant reduction in the amount of food consumed. Their data was based on the direct observation of eating.

Mahoney (1975b) found that changes in food consumption were related to the subject's beliefs about the effects of slow or fast eating, based on the experimenter's instructions. He reported that when subjects who were instructed

to eat more quickly or more slowly were told that this change in eating rate would increase food consumption, they ate more than if they were told that their eating pace (faster or slower) would decrease food consumption.

Clearly, the assumption that slowing the rate of eating will reliably reduce the amount of food consumed requires empirical validation. Nonetheless, the rationale for using this technique is appealing, and the few studies which have either directly or indirectly assessed the efficacy of slowing the eating rate are at least suggestive that this is a technique worthy of further investigation.

The second assumption, that the most important difference for treatment purposes is that the obese eat faster than the nonobese, arises directly from the first assumption, that obese persons eat differently than nonobese persons in the first place. Assuming that such differences exist, one would expect to find the obese to be the more rapid eaters leading to the "logical" conclusion that treatment should focus upon slowing their eating rate. As suggested earlier, such logistics actually have some empirical basis in physiological studies. The value of the notion that the focus should be on eating rate differences between obese and nonobese will become known as more studies attempt to manipulate this variable. It could be that other, less obvious differences in eating style between the obese and nonobese are more important for treatment purposes.

The assumption that there is a distinct "obese eating style" has received the most attention, although it remained virtually unexamined until 1975 (Mahoney, 1975b). Studies designed to investigate these differences have produced somewhat equivocal results. Mahoney (1975b) failed to detect any significant correlation between degree of obesity and three measures of eating style (bite frequency, meal duration, and eating rate). Warner and Balagura (1975) studied eating styles of obese and nonobese men and women under both laboratory and natural conditions. The only difference they found was in meal duration and this was qualified by a significant sex by obesity interaction. Obese females ate for a longer time than nonobese females, and obese males ate for a shorter time than nonobese males. They concluded that there were no differences between the eating behaviours of the obese and nonobese. Adams, Ferguson, Stunkard and Agras (1978) (1978) also reported data which supports the contention that obese - nonobese differences are nonexistent. They found no differences between obese and normal weight subjects with the exception of "time spent chewing," (the obese spent less time chewing). They did, however, find that the obese spent less time actively eating, less time chewing and more time drinking than "thin" (i.e., underweight) eaters. Stunkard, Coll, Lundquist and Meyers (1980) and Rosenthal and Marx (1978) also found no evidence of a distinct "obese eating style."

In contrast to these studies, several researchers have reported differences between obese and nonobese eaters. Although not investigating the actual eating behaviour *per se*, Meyer and Pudel (1972) reported differences in the rate of food intake between obese and nonobese subjects feeding from a food dispenser. They found that the obese tended to spread their food intake out over time, resulting in a steadily increasing curve of cumulative intake. The nonobese tended to consume most of the food during the first half of the eating period, after which rate of consumption tapered off. They considered the pattern of intake exhibited by the normal weight subjects to be more consistent with biological satiation. Gaul, Craighead and Mahoney (1975) observed 100 subjects in a naturalistic setting (fast food restaurant) and found that obese subjects took more bites, performed fewer chews per bite, and spent less time chewing than nonobese subjects. Marston, London, Cooper, and Cohen (1975) obtained results consistent with Gaul et al. (1975). They reported that obese subjects took larger bites at a greater frequency and spent less time engaged in extraneous activities (hesitations, toying with food, putting utensil down, drinking between bites, wiping mouth with napkin) than thin eaters. Hill and McCutcheon (1975) reported that obese men ate faster than nonobese men. Dodd, Birkby, and Stalling (1976) reported results which might help to explain some of the conflicting findings in this area. They found that

while a group of obese women in a fast food restaurant ate faster than did nonobese women, this difference disappeared when the women were matched on character of food. LeBow, Goldberg, and Collins (1977) reported that obese patrons observed in a fast food setting chewed their food less, spent less time engaged in extraneous activities and took fewer bites than the nonobese patrons. The latter finding is in contrast to earlier studies (Gaul et al. 1975, Marston et al. 1975) which reported that the obese took more bites than the nonobese. They suggested that this inconsistency may have been the result of different methodologies, observers, patrons, meals, and settings between studies, and emphasized the importance of the setting in which the data is collected (i.e. fast food restaurants, cafeterias, laboratories).

In a recent study, Strongman and Hughes (1980) reported that overweight subjects observed in a variety of eating establishments took more bites per minute than those who were of normal weight or less. They also emphasized the importance of the social conditions in which eating occurs, noting that the total time taken to eat a meal was dependent on whether the person ate alone or with others, irrespective of body weight. Subjects who ate alone took less time to eat a meal than those who ate with others.

Research investigating differences in eating style between obese and nonobese children has produced more consistent results. Epstein et al. (1976) were the first to com-

pare the eating behaviours of obese and nonobese children. They found no differences in general bite rate between obese and nonobese children. They suggested that this lack of difference may have been a function of having observed the children eating many different foods over several occasions. Six more recent studies documented a difference in eating style between obese and nonobese children (Drabman, Cordua, Hammer, Jarvie & Horton, 1979; Drabman, Hammer & Jarvie, 1977; Geller, Keane & Scheirer, 1981; Keane, Geller & Scheirer, 1981; Marston, London & Cooper, 1976; Waxman & Stunkard, 1980). All six demonstrated that obese children took more bites per minute than nonobese children. The ages of the children ranged from 1 1/2 to 14 years. In addition, obese elementary school children chewed their food less than nonobese children in a given interval (Drabman et. al., 1977), and obese pre-school children with a higher bite rate tended to chew at a faster rate than nonobese children with a lower bite rate, even though the obese children tended to chew each bite fewer times (Drabman et. al., 1979). Marston et. al. (1976) further reported that thin eaters left more food on their plate, and showed a significantly higher frequency of extraneous responses (i.e. hesitation, putting utensils down between bites) than did the obese eaters. Geller et. al. (1981) also reported that obese children consumed a greater proportion of the food on their plates and displayed a greater number of intervals with multiple eating

responses than did nonobese children. In a recent study, Waxman and Stunkard (1980) reported that obese boys consumed more calories than did their nonobese brothers at dinner and far more than their nonobese peers at lunch. Obese boys also ate faster than did their nonobese brothers at dinner, and far faster than their nonobese peers at lunch. Four families were assessed by non-participant weekly observations of family dinners and school lunches over a period of four to five months.

Thus, except for Epstein et. al.'s study, the research investigating eating styles of children appears to more consistently indicate that obese children eat more rapidly than nonobese children (as measured by bites/minute), and that this difference may be evident at as early an age as 1 1/2 years.

In a recent review of studies on the direct observation of eating behaviours Stunkard and Kaplan (1977) concluded that there is at present no agreement about a distinctive "obese eating style" but suggested that two measures showed promise in discriminating obese from nonobese persons:

1. Obese choose more food than nonobese persons;
2. Obese consume more food per minute than nonobese persons.

They further concluded that there is a remarkable plasticity of human eating behaviour; that it is strongly influenced by many extraneous, environmental factors; and that if it is so

dependent upon the environment, it may be easy to modify. This review included almost exclusively studies involving adult subjects.

One of the major criticisms of the research investigating eating styles offered by Stunkard and Kaplan was the typical lack of report of the size or character of the meal. They pointed out that even if the obese are found to eat differently than the nonobese, these differences could be a function of the kinds of foods selected. Second, studies of eating styles have rarely shown that distinct eating styles account for differences in the quantity of food consumed. This latter measure is particularly important since the rationale for altering eating styles is based on the assumption that certain eating styles will reduce the quantity consumed.

Both of Stunkard and Kaplan's criticisms are justified. Assessment of types of foods eaten should be fairly easy to accomplish. Measures of quantity of food consumed presents special difficulties, however, and require that the experimenter have relatively good control over the experimental conditions. In laboratory conditions, where a standardized meal is administered which can be examined both before and after consumption, quantity eaten is an easily obtained measure. However, as the conditions of an experiment become more "natural", the ease with which this measure can be taken diminishes. Specifically, the less obtrusive the experi-

menter, the less likely he/she will be able to measure the quantity of food a person consumes.

Several ingenious methods have been used to obtain some approximation of the amount consumed by individuals in naturalistic settings. For example, Stunkard et. al. (1980) provided patrons of a fast food restaurant with a coupon entitling them to a free standardized meal of 985 or 1800 calories. LeBow, Goldberg & Collins (1977) observed only those patrons of a fast food restaurant who purchased a "standard" meal. In both cases, however, an accurate measure of quantity consumed was only available if the subjects ate the entire meal. Since this did not always happen, Stunkard et. al. recorded the amount of food left on the plate in order to provide them with an estimation of quantity consumed. The accuracy of this measure (amount of leftovers) depends on the accuracy with which the leftovers can be quantified (i.e. weighed). Nevertheless, where weighing is not possible, as in most naturalistic settings, judgements of the proportion of the meal left over have been popular as indirect measures of quantity consumed (Geller et. al., 1981; Marston et. al., 1975, 1976; Strongman & Hughes, 1980; Stunkard et. al., 1980). In fact, the amount of food left over has been investigated as a behaviour in its own right which might distinguish obese eaters from nonobese eaters. Krassner, Brownell and Stunkard (1979) reported that overweight women left significantly less food on their trays than did

women of normal weight. Quantity of leftovers was judged in six categories (0%, 1-24%, 25-49%, 50-74%, 75-99%, 100%) for five food categories (main course, salads, vegetables, beverages, desserts). Using this technique Krassner et. al. were able to report a mean inter-rater reliability over all observations of 87.8%. It appears that in naturalistic studies of eating behaviour, ratings of leftovers are currently the least obtrusive technique available for assessing quantity consumed by an individual.

While evidence for obese-normal differences in the eating style of adults is far from definitive, some of the research to date suggests differences may exist. Much of the disagreement between studies may be a function of different methodologies, and a failure to recognize the importance of environmental variables on an individual's eating behaviour. Further, the comparability of studies conducted in different settings is questionable (i.e. cafeteria, laboratory, fast-food settings, restaurants), and may account for some of the differences between studies. An important environmental variable suspected to affect the eating behaviour of individuals is the presence of others. As reported earlier, Strongman and Hughes (1980) reported that the total time taken to eat a meal was dependent on whether the person ate alone, or in the company of others. Waxman and Stunkard (1980) found that family membership had a powerful influence on food intake in children, an effect even stronger than

that of weight status. This agrees with the findings of Coll, Meyers and Stunkard (1979) who found that the site of eating was a far more powerful influence on food intake than was weight status. Waxman and Stunkard (1980) concluded that "eating behaviour is enormously plastic; the major influence on how much people eat is the circumstances of their eating" (p. 192).

Recent research (Herman, Polivy & Silver, 1979; Polivy, Herman, Younger & Erskine, 1979) has indicated that obese eaters may modify their eating behaviours in the presence of others to more resemble the eating behaviour of nonobese eaters. This effect remains to be examined more thoroughly and might be an important factor to consider when observing the eating behaviour of individuals in crowded restaurants, cafeterias, or laboratories where the subject is exposed to others. A more detailed discussion of this factor will follow later.

Several explanations may account for the relatively more consistent results obtained from research on eating styles involving children. First, procedural differences between studies may account for a large part of this difference. Compared to studies using adult subjects, there have been fewer studies reported investigating the eating behaviour of children (until recently). As the number of such studies increases, a similar pattern of inconsistent results may emerge. With the addition of the two recent studies by Ke-

ane et. al. (1981) and Geller et. al. (1981) which reported significant differences between the eating behaviours of obese and nonobese children on three separate samples (Geller et. al. reported two studies in the same publication), the hypothesis that obese children eat differently than nonobese children has begun to attain a firm empirical basis. Both studies add to the growing body of research that clearly supports a distinctive eating style for obese boys and girls, in contrast to studies using adult subjects.

A second possible explanation is that it may be that as a person grows older, his/her eating patterns may change as the result of longer exposure to environmental influences on his/her eating behaviour and/or as a result of increasing opportunities to observe and learn eating behaviours more consistent with other individuals in his/her social environment. By the time a particular individual has become an adult, his/her eating behaviour may be quite different from his/her earlier years. Thus, as a group, obese and nonobese adult's eating behaviours may be either more varied, a direct result of the varied environments to which each individual has been exposed; or more homogeneous, a result of having learned a socially acceptable style of eating over the years. In either case, obese-normal differences in eating style would diminish with increasing age of the sample being observed. This explanation has also been independently offered recently by Geller et. al. (1981) as a possible

reason for the discrepancy between adults and children in the display of an obese eating style.

Geller et. al. (1981) also offered a third possible explanation for this discrepancy. They suggested this difference could be due to the lack of differentiation of adult-onset versus childhood-onset obesity typically found in the adult studies. It could be that those factors responsible for adult-onset obesity are different from those responsible for childhood-onset obesity, where eating style might play a more important role.

Nevertheless, while research with children suggests that the obese and nonobese may differ in eating style, research with adults is still equivocal. Part of the original intent of these investigations was to isolate behaviour patterns that may be predictive of obesity. Wooley et. al. (1979) suggested that rather than comparing the eating styles of obese and nonobese subjects, it may be more useful to compare eating styles of large and small quantity eaters. They argued that the hypothesis that certain eating habits might indeed lead to greater overall consumption remains untested. If this hypothesis is proven valid, then the development of techniques designed to alter eating styles would still be of value clinically, whether or not obese and nonobese differences existed. They further argued that any attempts to alter eating style should relate behaviour changes to changes in overall food intake rather than to weight loss, since the

latter does not always vary in expected ways with changes in food intake.

In response to the growing body of research supporting a distinctive "obese eating style" in children, at least three separate reports (Drabman et. al., 1977; Geller et. al., 1981; Keane et. al., 1981) have recommended that the development of techniques to modify eating habits in children would be a valid treatment approach. For example, Keane et. al. (1981) concluded that "suggestions to increase interbite interval, to reduce bite size and sip size, and to decrease eating rate would at this time have reasonable, empirical support" (p. 285). Similarly, Geller et. al. (1981), concluded that "it appears certain that behavioral instructions and training to modify eating styles in children at high risk for obesity would be quite appropriate at this time" (p. 14).

The behavioural treatment of childhood obesity

The importance of focusing treatment for obesity on children has recently been advocated by researchers and practitioners (e.g., Coates & Thoresen, 1978). To date, relatively few studies have addressed the problem of childhood obesity. The most overwhelming argument in favor of treating obese children is based on convincing evidence that overweight infants become overweight adolescents, who in turn become overweight adults (Asher, 1966; Garn & Clark,

1976; Garn & Cole, 1980; Rimm & Rimm, 1976). For example, Rimm and Rimm (1976) concluded that severe adult obesity is definitely related to childhood obesity, and argued that efforts should be directed towards children to discourage the development of childhood obesity and its possible successor, adult obesity. The estimated odds against an overweight adolescent becoming an average weight adult are 28 to 1 (Stunkard & Burt, 1967). Further, obesity among children and adolescents is associated with an increased risk of a variety of physical and psychological problems (Brownell & Stunkard, 1980; Cahnman, 1968; Coates & Thoresen, 1978; DeJong, 1980; Hoffman, 1957; LeBow, 1977b). It has been argued that treatment in early life is especially crucial because children might learn and use appropriate eating habits more easily when they are young (Carman, 1976; Coates & Thoresen, 1973; Drabman et. al., 1977; Huenemann, 1974). Evidence of an "obese eating style" in children (i.e. more bites, fewer chews) has been reported (discussed previously) at as early an age as one and a half to two years. Attempts to alter the eating styles of children have been successful, although few in number (Epstein et. al., 1976; Perry, LeBow & Buser, 1979; Rivinus, Drummond & Combrinck-Graham, 1976). Epstein et. al. were able to slow the rate of eating and amount consumed by children by instructing them to place their eating utensils down between bites, while Perry et. al. used modeling procedures.

Based on growing evidence of a distinctive eating style in children, it has been recently suggested that the use of techniques designed to modify children's eating habits is a valid treatment approach which at this time has reasonable empirical support (Geller et. al., 1981; Keane et. al., 1981).

The inclusion of family members in the treatment process

The inclusion of significant others in behavioural treatments of obesity has resulted in impressive successes with couples (Brownell et. al., 1978; Israel & Saccone, 1979; Pearce, 1980; Saccone & Israel, 1978). Brownell and Stunkard (1978b, 1980) argued that parents should be able to exert even more influence on their children than spouses can on each other. Many behavioural family therapists agree that a child's behaviour may be greatly influenced by significant others in the environment. Recently, studies treating obesity in children have involved parents with positive results. However, only a few studies have assessed the importance of significant others in behavioural treatments of obese children. Kinglsey and Shapiro (1977) failed to demonstrate the importance of the mother's involvement in a behaviour therapy package for obese children. Aragona, Cassady and Drabman (1975) included parents in their program with positive results.

Thus, there is increasing evidence suggesting that restructuring of an individual's environment, specifically by involving significant others in a treatment program, may facilitate treatments designed to alter the eating habits of individuals, as well as helping to increase the long term efficacy of those treatments (Israel & Saccone, 1979; Pearce, 1980).

The alteration of eating behaviour using modeling methods

The use of modeling procedures (Bandura, 1969) as a technique for altering eating behaviour in the obese has been limited (e.g., Conger, Conger, Costanzo, Wright & Matter, 1980; Perry et. al., 1979; Nisbett & Storms, 1974). In most cases, modeling has been used sparingly as one of many techniques in a treatment "package" to aid patients in carrying out instructions. The efficacy of modeling as a technique for altering consummatory behaviours has only recently been directly examined. Perry et. al. (1979) were able to effectively slow children's eating rate by exposing them to a videotape of either a same-sex adult or themselves eating at a reduced rate. DeLuca and Spigelman (1979) varied the weight of a model, keeping the amount eaten by the model constant, and found that obese subjects ate significantly less in the presence of a nonobese model than in the presence of an obese model. These effects were not found for nonobese subjects. In a related area, DeRicco and Niemann

(1980) were able to decrease by one-half the amount of beer consumed by a subject by having models who were drinking with the subject drink at one-half the rate of the subject. Similar results have been reported elsewhere (Caudill & Lipscomb, 1980; Caudill & Marlatt, 1975).

Much of the research investigating the influence of models on eating behaviour in the obese arose indirectly from studies on the sensitivity of obese individuals to social cues. This, in turn, was an extension of Schacter's externality hypothesis which suggests that overweight individuals are more likely to be induced to eat by salient external cues than normal weight individuals (Rodin, Slowchower & Fleming, 1977; Schacter & Rodin, 1974). Related investigations have been extended to non-eating situations such as time estimation (Pliner, 1973b), thinking (Pliner, 1973a), affective behaviour (Pliner, Meyer & Blankstein, 1974), reaction time (Rodin, Herman & Schacter, 1974), and distractibility (Rodin, 1973). Evidence is weak that the obese are generally external in orientation, but there is supporting evidence that they are more responsive to sensory cues than normal weight individuals, although this evidence is not clearcut (Conger et. al., 1980).

Recently, investigations have begun to examine the effects of social cues on eating behaviour. Conger et. al. (1980) argued that if the obese are generally more responsive to external cues, they should exhibit a similar in-

creased sensitivity, relative to the nonobese, to social cues of eating. One of the earliest reported studies addressing this argument was by Nisbett and Storms in 1974 (reported in Conger et. al., 1980) who reported no differences in eating behaviours between obese and nonobese persons exposed to models who ate large amounts of food. What they did find was that increased food consumption by a model resulted in increased food consumption by all groups of subjects (obese and nonobese).

Conger et. al. (1980), in a study intended as a direct test of Schacter's externality hypothesis, predicted differences between obese and nonobese subjects' eating behaviours when they were exposed to models eating at various rates. The dependent variable was total amount eaten. Inconsistent with Schacter's hypothesis, they found no differences in amount eaten between obese and normal weight subjects, although there were sex differences. What they did report was a strong modeling effect on all subjects. They explained the modeling effect as "disinhibitory" and suggested that all people, and obese women in particular, are inhibited when eating in the presence of a non-eating peer, and that when this peer (model) eats, this disinhibits the subject's eating response. In support of their argument they pointed out that even when the model ate a considerably large amount of food, the subject never ate in excess of the amount he/she would have eaten if left alone. They also reported that

all subjects ate more when in the presence of a same-sex model.

In a study designed to assess the effects of being observed while eating, Herman et. al. (1980) either explicitly observed or did not observe "restrained" and "unrestrained"[3] eaters engaging in ad lib eating following a preload. They found that unrestrained eaters were unaffected by the presence of an observer. Restrained eaters, however, failed to compensate for a preload when unobserved, and compensated strongly when observed. They concluded that the presence of an observer does not simply inhibit eating of restrained eaters, but causes them to eat more like unrestrained eaters. These findings have serious implications when considering studies on eating styles in which subjects either knew they were being observed, or which observed eating in the context of others (i.e. restaurants).

In a study designed to explicitly assess the effects of models on eating behaviour, Polivy et. al. (1980) found that the amount eaten by a subject was positively correlated with the amount eaten by a same-sex model. They observed no differences between the obese and the nonobese. They further reported that the presence of a model who who claimed she was on a diet suppressed eating in all subjects, and that restrained eaters ate a smaller absolute amount in the pres-

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[3] Restrained eaters are loosely defined here as individuals who are currently on a diet, or who have frequently dieted or tried to lose weight in the past.

ence of a model. They concluded that:

1. being a dieter leads to less eating in the presence of others;
2. being with someone else who eats less causes one to eat less also;
3. being with a dieter causes one to eat less.

In view of the recent studies on modeling effects reviewed above, one might be inclined to conclude that the obese and nonobese do not differ in their sensitivity to modeling effects related to eating behaviours. This conclusion is questionable in view of the recent studies which suggested that the obese may alter their eating behaviour so as to resemble nonobese eaters when they are in the presence of others. It is important to note that in all of the studies explicitly investigating the effects of others on eating behaviours, the subject was exposed to a person who they did not know. It seems reasonable to suspect that if people are in fact inhibited in their eating by the presence of others, that this inhibition would be most pronounced when the other person is a stranger. Such effects may also be present when the subject eats in a social setting where many strangers are present, such as in a restaurant.

While the question of obese-normal differences in sensitivity to models remains unanswered, it appears that modeling may be an effective means of altering the eating behaviour of individuals, regardless of their weight. One

conclusion of all of the above studies was that modeling of eating behaviours did occur in general. That is, subjects tended to consume roughly the same amount of food as an unfamiliar model accompanying them while they ate. Of course, the conclusions from the few studies investigating this effect are far from clearcut, and variables such as weight of model and subject, familiarity of model, context of eating, etc., all need to be examined more thoroughly. Nevertheless, the research to date is highly suggestive that a model can markedly influence the amount of food a person consumes, and this has several implications for future and past research. For example, one must wonder if such effects might be occuring in restaurants between all patrons. The empirical question this raises is whether people eat differently in restaurants, where they are exposed to many different potential models, than they do at home, where they probably do most of their eating. Second, are people less likely to be inhibited by the presence of others with whom they are familiar than by others who are virtual strangers? For example, one might suspect that a person would be less inhibited in their eating style in their own home in the presence of family members. In the only study in which models and subjects were at least vaguely familiar with each other prior to the study (children all in the same nursery school), Birch (1980) investigated the effects of peer modeling on the food preferences of pre-school children. They found

that exposing a child to a peer model who selected and consumed a food which the subject disliked increased the consumption and choice of the non-preferred food by the target child, even in the presence of a highly preferred food.

A further note is that, except for Birch's study, nearly all modeling studies chose the amount of food consumed as the dependent variable. Only Perry et. al. (1979) examined actual consummatory behaviour. In view of the increasing utilization of techniques designed to alter eating behaviours of the obese in behavioural obesity treatment programs, this is a variable which warrants further examination.

Finally, the value of using modeling as a technique to slow a person's eating rate will be ultimately assessed by the applicability of this technique in clinical practice. To date, nearly all studies using modeling techniques to alter eating behaviours have been conducted in laboratory situations. Whether the observed effects of this method will generalize to other settings is still unproven. Presently, it appears that modeling has fairly immediate effects, with behaviour changes occurring in the subject almost immediately upon exposure to the model. It is questionable whether such behaviour changes would continue if the model were to be withdrawn. The finding that the presence of a model affects the eating behaviours of the observer is, however, in itself clinically useful. All one

would have to do is ensure that the identified subject does most of his/her eating in the presence of a model or models exhibiting appropriate eating behaviours. Since nearly everyone (especially children) eats a large number of their meals at home in the presence of family members, it seems reasonable to consider training family members to act as models for other members wishing to change their eating habits. The major advantage of this strategy is that the identified subject would be exposed to the model during nearly all eating episodes.

When the identified patient is a child, using parents and/or siblings as models has a further advantage. For example, using parents as models for their children is thought to be a powerful technique for influencing a child's behaviour (Rosenthal & Bandura, 1978) since parents possess many of the characteristics deemed valuable for enhancing a model's influence. A parent is likely to be perceived by his or her children as one who deserves trust, one who compels attention, one who appears as a realistic reference figure to compare oneself with, and one whose conduct offers plausible standards to guide the child's aspirations (Rosenthal & Bandura, 1978).

Single case methodology

The unique contribution of single case experimental designs is that they can experimentally evaluate interventions for individual subjects (Kazdin, 1978). Single case designs have been used increasingly in clinical research. One reason for their increasing popularity arises from a growing awareness among researchers that the traditional group comparison approach has many difficulties which limit its usefulness as an approach in applied research. Hersen and Barlow (1976) classify these difficulties under five headings: (1) ethical objectives, (2) practical problems in collecting large numbers of subjects, (3) averaging results over a group, (4) inter-subject variability, and (5) generality of findings.

Ethical objectives. This refers to the ethical problem in withholding treatment altogether from a no-treatment control group. Although such objections may at times be illogical, as when it is not known if the treatment in question is any more effective than the control condition, many clinicians react negatively to withholding any treatment, proven effective or not. The problem of control groups in obesity research has, in the past, been a troublesome one. As discussed previously, one of the criticisms of past research has been the inadequacy of "no-treatment" control groups (Stuart, 1975). This was partly the result of attempts to design control groups that did not appear too fictitious.

Practical problems. Hersen and Barlow refer here to the difficulties which are often encountered assembling large numbers of subjects homogeneous for a particular behaviour disorder. This is generally not a problem for obesity research. Nevertheless, while available subjects may be numerous, treatment programs are often intensive and lengthy, making evaluation of such treatments often costly and time-consuming for large numbers of subjects. In addition, research in areas requiring more intensive observation periods and long term commitment by the subjects has been avoided. A good example of such research is a study reported by Waxman and Stunkard (1980) on calorie expenditure and intake of young boys. This required naturalistic observation (in the home and at school) of families for a period of four to five months. Although Waxman and Stunkard advertised widely for subjects, they were only able to find four families willing to submit to the conditions of the study who also met their eligibility criteria. Yet, this studied added much needed data to an area rarely researched.

Averaging of results. This refers to the obscuring of individual clinical outcome in group averages. Averaging of individual data is one of the major problems with past research on obesity (Stuart, 1975). Studies have frequently reported only the average weight loss for a group. This obscures the fact that some individuals may have lost very little weight, some may have gained, and others may have

lost amazingly large amounts of weight. In most cases, average weight losses are either not significant, or statistically but not clinically significant. Thus, many treatment techniques may be ruled ineffective even though some individuals may have benefited enormously from them. The absence of individual data precludes the possibility of isolating variables which may have accounted for the variability of outcome. Such information would be valuable for predicting which individuals could or could not benefit from a particular treatment strategy. This problem is closely related to the problem discussed next.

Inter-subject variability. Large inter-subject variability often accounts for the "weak" effect obtained in group comparison studies where some clients show considerable improvement, some show none, and others deteriorate. This results in an "average" improvement which may be statistically, but not clinically significant. Group designs ignore the course of a specific subject during treatment, which is of great practical use to clinicians. It was reported in preceding sections that several reviews of behavioural treatments of obesity concluded that a consistent finding was that inter-subject variability on measures of treatment outcome was generally very high. The utility of reporting individual data was recognized.

Generality of findings. The difficulty of generalizing results from a study to the general population is often considered to be more of a problem for single case designs than for randomized group designs. Hersen and Barlow refer here, however, to the problem of generalizing from the group to the individual. They asserted that since group studies do not reflect changes in individual patients, findings are not readily translatable or generalizable to the clinician since the clinician cannot determine which particular subject characteristics are associated with change. Group designs typically attempt to obtain a random sample of subjects in order to improve the generalizability of the results to the "general population". However, one problem with this approach is that the more "random" a sample is, in that all relevant population characteristics are represented, the less relevance will any findings have for a specific individual. In addition, Hersen and Barlow point out that, more typically, group designs, and particularly clinical studies, do not pretend to draw a truly random sample of subjects but choose subjects on the basis of availability. Such an arrangement suffers for two reasons:

> to the extent that "available" clients are not a random sample, one cannot generalize to the population; but to the extent that the group is heterogeneous on any of a number of characteristics one cannot make statements about the individual. The only statement that can be made concerns the average response of a group with that particular make-up which, unfortunately, is unlikely to be duplicated again. (p. 56)

Hersen and Barlow have taken issue with the criticism that single case designs lack external validity since they examine only a few subjects who could not possibly be representative of the general population. In commenting on the generalizability of single case designs they wrote:

> that this issue, more than any other has retarded the development of single case methodology and caused many researchers to deny the utility of studying a single case for any other purpose besides the generation of hypotheses. (p. 52)

In defense of single case methodology Kazdin (1978) stated that "the ultimate test of generality of findings among subjects or any other condition is replication" (p. 640). Hersen and Barlow go even further to suggest:

> In terms of external validity or generality of findings, a series of single case designs in similar clients in which the original experiment is directly replicated three or four times can far surpass the experimental group/no-treatment control group design. (p. 58)

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Appendix A

Newspaper Advertisement

Newspaper Advertisement

WEIGHT CONTROL RESEARCH

Families requested for 2-3 week study. Free weight control program to follow. University of Manitoba, Mr. Joseph Rallo. Phone ...

Appendix B

Telephone Interview

Telephone Interview

The first contact with the family will be on the telephone when they respond to the advertisement. During the telephone contact the experimenter will briefly describe what will be required of the family for the study. They will be told that:

1. they should be available for a period of two weeks for the study during which they must permit someone into their homes during dinner to videotape their meal. This will likely take place on 14 consecutive days, although one or two breaks might be allowed. In any case, they should be able to commit themselves to the study for 14 days over a two to three week period. On each day the experimenter will arrive at their home, set up the camera, note what they will be eating, weigh their food, and leave them alone during the actual meal. When the meal is over, the experimenter will return, pick up the equipment, estimate what has been eaten, and leave.
2. for their part they will be required to do very little besides the above. However, the parent(s) will be required to try to learn a new eating habit for at least four days. This will be totally harmless, fairly easy to learn, and require no practice or extra time outside of their normal dinner time.

3. if the family consists of two parents, the cooperation of both the husband and wife is essential.

Once the respondents have been given this information, if they are still interested in the study the experimenter will continue with the following:

> "Since you are still interested then, I should tell you a little more about this study. As I said, we would like to visit your home during dinner time to videotape your meals. However, we are only interested in families with certain characteristics, so not everyone who responds to this study will be eligible for participation. Therefore, I would like to ask you a few brief questions now so that I won't unnecessarily take up any more of your time. O.K.?
>
> 1. Do you have any children?
>
> 2. What are their ages and sex?
>
> 3. Could you give me a rough estimate of your weight and height? ... your husband's (wife's) weight and height?...your children's weights and heights?"

If the subject is unable to provide the above weights and heights, he/she can be given the opportunity to phone back with this information, provided the family still meets the eligibility requirements after answering the first two questions.

At this point, families will be excluded if: (a) there are no children between the ages of 4 and 12 years; or, (b) either the mother or father are clearly not overweight. Tables of ideal weights will be kept by the telephone for reference.

Families who are not eligible at this point will be informed by the experimenter in one of the following ways

> "I am sorry Mr./Mrs. [ ], but I am afraid that we cannot use your family in our study.
>
> 1. You see, this is a study which is concerned with weight control, and from what you've just told me, it appears that neither you nor your husband/none of your children are overweight.
>
> 2. You see, we are looking for families with certain characteristics, one of which is that the family include at least one child between the ages of 4 and 12 years."

Families who appear eligible for the study will be told the following:

> "It appears from what you've told me Mrs./Mr. that your family may be eligible for this study. This will depend however on some more detailed information which I will have to obtain from you and your family. Therefore, I'd like to schedule an interview with you and have you fill out some questionnaires. This interview will have to take place here (university), and it will be necessary for all of you to be present. You should remember that this interview does not necessarily mean that you have been selected for participation in this study. This will depend on the information I get from you in the interview."

At this point the experimenter will schedule an interview with the family. If the family is absolutely unable to make it to the university for an interview, the interview can take place in the family's home. However, at some point arrangements will have to be made to weigh each family member using a physician's beam balance. All information obtained during the telephone contact will be recorded on the standardized data form attached at the end of this appendix.

TELEPHONE CONTACT SHEET

FAMILY NUMBER:_____ Date:_____

Time:_____

FAMILY'S LAST NAME:_____

NAME OF CALLER:_____ MOTHER ( ) FATHER ( )

TELEPHONE:_____

I.

a) available two weeks for observation. YES ( ) NO ( )
b) willing to try behaviour change. YES ( ) NO ( )
c) spouse will cooperate. YES ( ) NO ( )

(Exclude if NO to any of the above.) EXCLUDED ( )
STILL ELIGIBLE ( )

II.

1. Do you have any children? YES ( ) NO ( )

Number (assign)	Name of Child	Age	Sex

2. WEIGHT STATUS

Person	Frame (s,m,l)	Height	Weight
Mother			
Father			

Will call back with information ( )

Call received ( )

TELEPHONE CONTACT SHEET (cont'd)

III. DISPOSITION

( ) EXCLUDED, NO CHILDREN.
( ) EXCLUDED, NO CHILDREN 4-12 YEARS.
( ) EXCLUDED, NO OVERWEIGHT PARENTS.
( ) EXCLUDED, NO OVERWEIGHT CHILDREN.

( ) ELIGIBLE, INTERVIEW ARRANGED.
( ) ELIGIBLE, INTERVIEW TO BE ARRANGED...
YOU WILL CALL BACK_____ ( )
THEY WILL CALL BACK_____ ( )
...INTERVIEW ARRANGED ( )

( ) INELIGIBLE, WAITING LIST.
CALL BACK_____( )
_____( )

DATE AND TIME OF INTERVIEW:

_____

WHERE?

_____

_____

Appendix C

Selection Interview

Selection Interview

At the beginning of the interview the mother, father and any children older than 16 will be asked to sign a Consent for Use of Data form (Appendix E). The mother and/or father will then be asked to fill out the Stanford Eating Disorders Clinic Questionnaire (Agras et. al., 1976) (Appendix D). While they are doing this, the children will each be weighed on a physician's beam balance, and triceps skinfold and circumference measures taken. These measures will be taken for the parents when they have completed the questionnaire. The parents will then be asked the following questions:

1. Are you, or any of your children presently on a diet of any kind, or using a popular diet book to lose weight?
2. (To mother) Mrs. [ ], are you presently pregnant, or do you suspect that you may be pregnant?
3. Approximately how long does a typical dinner meal take for your family?
4. Would you both be willing to allow either myself, or one of my assistants to videotape your dinner meals on 14 consecutive days when everyone in your family is present?
5. Would you be willing to permit me to weigh your food before you begin eating, and to observe and weigh your food at the end of the meal before you have cleared your plates?

6. Could you indicate to me on this calender what possible days you would be available for the study?

7. Would you, Mr. and Mrs. [ ], both be willing to carry out instructions to try to learn a new eating habit for at least four days? This would require a minor change to your present eating habits, is very easy, perfectly harmless, and will require no preparation or extra practice on your part. However, it will initially require some effort on your part.

All information obtained during this interview will be recorded on the standardized data form attached at the end of this appendix.

SELECTION INTERVIEW - DATA FORM

I. FAMILY NUMBER: _____ DATE: _____

FAMILY NAME: _____ TIME: _____

UNIVERSITY ( ) HOME ( ) TELEPHONE: _____

ADDRESS: _____

_____

NAME	POSITION	D.O.B.	AGE	SEX	TSM	HT.	WT.	CHEST	WAIST	HIPS	THIGH	FRAME

Number of Children: ____

II. CONSENT FOR USE OF DATA FORM

NAME	SIGNED (✓)

STANFORD QUESTIONNAIRE

NAME	POSITION	COMPLETE (✓)
	Mother	
	Father	

III. QUESTIONS

1. Other diets? YES ( ) NO ( )
   IF YES, explain: _____
   _____
2. Pregnant or suspect? YES ( ) NO ( )
3. Length of meal? (minutes) _____
4. Willing to be observed? YES ( ) NO ( )
5. Willing to permit food to be weighed? YES ( ) NO ( )
6. Both parents willing to change? YES ( ) NO ( )

PERIODS AVAILABLE:

_____

_____

_____

IV. Family will be contacted by (date) _____

V. DISPOSITION

A) ELIGIBLE ( ) PRE-TEST SESSION ARRANGED ( )

TIME: _____

DATE: _____

B) INELIGIBLE ( )

Reason: _____

_____

VI. ATTEMPTS TO CONTACT FAMILY (RE: ELIGIBILITY)

DATE	TIME	COMMENTS

FAMILY CONTACTED ( )

Appendix D

Stanford Eating Disorders Clinic Questionnaire

STANFORD EATING DISORDERS CLINIC QUESTIONNAIRE

EATING AND ACTIVITY ASSESSMENT

Name: _____ Sex: M F Age: _____

Birthdate: _____

Address: _____ Home Phone: _____

_____ Office Phone: _____

WEIGHT HISTORY

1. Your present weight _____ height _____

2. How would you describe your present weight (circle one)?

very overweight | slightly overweight | about average

3. At what weight have you felt your best or do you think you would feel your best?

_____

4. How much weight would you like to lose? _____

5. How dissatisfied are you with the way you look at this weight?

Completely satisfied | Moderately satisfied | Neutral | Moderately dissatisfied | Very dissatisfied

6. Do other people readt to your weight problem? Yes ___ No ___
If yes, how do they react? _____

_____

7. Why do you want to lose weight at this time? _____

_____

8. What are the attitudes of the following people about your attempt(s) to lose weight?

	Negative (e.g., disapprove, resentful)	Indifferent (e.g., don't care, don't help)	Positive (e.g., encourage)
Husband			
Wife			
Children			
Parents			
Employer			
Friends			

9. Do the attitudes or behaviour of your spouse or children affect your weight loss or gain? Yes ___ No ___ If yes, please describe: _____

_____

10. Indicate the periods in your life when you have been overweight on the following table. Where appropriate, list your maximum weight for each period and number of pounds you were overweight. Briefly describe any methods you used to lose weight, e.g., diet pills, diet, in that five year period. Also list any significant life events you feel were related to either weight gain or loss, e.g., college tests, marriage, pregnancies, illness.

Age	Maximum Weight	# Pounds Overweight	Methods Used to Lose Weight	Significant Events Related to Weight Change
Birth				
0-5				
5-10				
10-15				
15-20				
20-25				
25-30				
30-35				
35-40				
40-45				
45-50				
50-55				
55-60				
60-65				

11. How do you feel your weight affects your daily activities? (circle one)

No effect Some effect Often interferes Extreme effect

12. How physically active are you? (circle one)

Very active Active Average Inactive Very inactive

13. What do you do for physical activity and how often do you do it?

Frequency (daily, weekly, monthly)	Activity (swimming, jogging, dancing, etc.)

14. A number of different ways of losing weight are listed below. Please indicate which methods you have used by filling the appropriate blanks.

	Ages Used	Number of Times Used	Maximum Weight Lost	Comments: Length of time weight loss maintained; success failure
TOPS				
Weight Watchers				
Streamliners				
Pills				
Supervised diet				
Unsupervised diet				
Starvation diet				
Behavior mod				
Psychotherapy				
Hypnosis				
Other				

15. Which method did you use for the longest period of time?

_____

16. In your attempts to lose weight, have you ever had a physical or emotional reaction of such severity that it impaired your family and/or work relationships or functioning?

Yes ___ No ___ If yes, please describe the symptoms and how

long they lasted. _____

_____

_____

_____

17. What usually goes wrong with your weight loss programs?

_____

_____

_____

MEDICAL HISTORY

18. What are your present medical problems? _____

_____

19. What medications or drugs are you taking? _____

_____

20. Are you allergic to medications, drugs or foods? _____

_____

21. Please list any hospitalization or operations. Indicate your age for each hospital admission.

Age	Reason for hospitalization
_____	_____
_____	_____
_____	_____

22. Please list, by age, any serious illnesses you have had which have not required hospitalization or operations.

Age	Nature of illness
_____	_____
_____	_____
_____	_____

23. Please describe any medical problems you have which are complicated by your weight. _____

_____

_____

24. When did you last have a complete physical exam? _____

_____

25. Who is your current doctor? _____

26. Please list any psychiatric contact, individual counselling, or marital counselling that you have had or are now having (next page).

Age	Reason for contact and type of therapy
_____	_____
_____	_____
_____	_____

SOCIAL HISTORY

27. Please describe your present occupation _____

_____

28. How long have you worked for your present employer? _____

_____

29. Circle the last year of school attended:

1 2 3 4 5 6 7 8 Grade School 9 10 11 12 High School 1 2 3 4 College M.A. Ph.D.

other _____

30. Please answer the following questions for each marriage:

Date of marriage _____

Date of termination _____

Reason (death, divorce, etc.) _____

Number of children _____

31. Yearly income: (circle one)

0 - 5,000 5,000 - 10,000 10,000 - 15,000

15,000 - 20,000 above 20,000

32. Please describe your spouse's occupation in detail.

_____

_____

33. Spouse's age _____ Weight _____ Height _____

34. How would you describe your spouse's weight (circle one)

very overweight slightly overweight about average slightly underweight very underweight

35. Please list your children's age, sex, height, weight, and circle whether they are overweight, underweight, or average. Include any children from previous marriages whether they are living with you or not.

Age	Sex	Weight	Height	Overweight		Average	Underweight	
___	___	_____	_____	very	slightly	average	slightly	very
___	___	_____	_____	very	slightly	average	slightly	very
___	___	_____	_____	very	slightly	average	slightly	very

36. Who lives in your house with you? _____

_____

37. Is your father living? Yes ____ No ____ Father's age now or age and cause of death _____

_____

38. Is your mother living? Yes ____ No ____ Mother's age now or age and cause of death _____

_____

39. Describe your father's occupation _____

_____

40. Describe your mother's occupation _____

_____

41. Describe your father's weight while you were growing up (circle one)

very overweight | slightly overweight | about average | slightly underweight | very underweight

42. Describe your mother's weight while you were growing up (circle one)

very overweight | slightly overweight | about average | slightly underweight | very underweight

43. Please describe your family attitudes toward food and eating while you were growing up _____

_____

_____

44. Who raised you as a child? _____

45. Please list your brothers' and sisters' ages, sex, present weight, height, and circle whether they are overweight, underweight or average.

Age	Sex	Weight	Height	Overweight		Average	Underweight	
___	___	_____	_____	very	slightly	average	slightly	very
___	___	_____	_____	very	slightly	average	slightly	very
___	___	_____	_____	very	slightly	average	slightly	very
___	___	_____	_____	very	slightly	average	slightly	very

46. Please write any other information you feel is relevant to your weight problem below. This would include interactions with your family and friends that might sabotage a weight loss program.

_____

_____

_____

_____

Appendix E

Consent for Use of Data Form

CONSENT FOR USE OF DATA FORM

Mr. Joseph Rallo has my permission to use data about me, _____ , and my immediate family, gathered while I participated in a research project on family eating habits conducted at my home and the University of Manitoba, Winnipeg, Manitoba. This information may be used for presentations at professional/scientific meetings and in professional publications. However, no person in the family, nor our family name, nor other identifying information would be included in any presentations or publications made by Mr. Rallo.

Signature of Participant: _____ Date: _____

Appendix F

Contract

CONTRACT

We, the undersigned agree to participate in a research study on family eating habits conducted by Mr. Joseph Rallo of the University of Manitoba. As part of this study we agree to all of the following conditions:

1. We will allow either Mr. Rallo or one of his research assistants into our homes to videotape our dinner meal on the days specified in the schedule attached to this contract.
2. We, the undersigned, agree to all be present for dinner on each of the days scheduled in this contract.
3. We, the undersigned, agree to all present ourselves for an interview to take place at the University of Manitoba following the last day on which our dinner meal has been observed, to be scheduled within one week of the last day of dinner meal observation.
4. I, _____ and I, _____ agree to carry out instructions, to be supplied by Mr. Rallo or his assistant, to alter some component of my eating behaviour, which I understand to be perfectly harmless, for five to ten days during the days scheduled in this contract. On all days when I am instructed to do so, I will try to the best of my ability to carry out these instructions.
5. On the days scheduled for observation we the undersigned agree to allow Mr. Rallo or one of his assistants to record the types of foods we will be eating, observe our dinner plates, and weigh our food before we begin eating. At the end of each meal we agree to permit Mr. Rallo or one of his assistants to observe our dinner plates, and weigh any leftover food before clearing our plates.

2...

We understand that failure by any one of us to comply fully with any one or more of the conditions stated in this contract will result in cancellation of this contract and all of the conditions in this contract, and will absolve Mr. Rallo of any responsibility for conditions to which he has agreed in this contract.

SIGNATURE OF PARTICIPANTS: NAME (PRINT):

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

DATE: _____

As an incentive for participation as set out in this contract, I, Joseph Rallo, agree to provide _____ free participation in a weight control program to be conducted at the University of Manitoba Obesity Control Centre. This program will be of approximately 4 months duration and begin within ___ days of the last day of observation scheduled in this contract. Although weight loss is probable, this weight control program can offer no guarantee for weight loss and will require active participation on the part of the patient. Failure on the part of <u>any one</u> of the family members signing this contract to comply with the conditions set out in this contract will result in forfeiture of free participation for _____ in the weight control program.

Signed: _____ Date: _____

Joseph Rallo

SCHEDULE OF DAYS FOR OBSERVATION

DATE	TIME

SIGNATURE OF PARTICIPANTS:

NAME (PRINT):

EXPERIMENTER'S SIGNATURE: _____

DATE:

Appendix G

Pre-Observation Phase: Standardized Instructions

Pre-observation phase: Standardized instructions

"First let me say how pleased I am that you can be involved in this study. We are very excited about this study and hope to get some very useful information from it. We also believe that once the study gets underway you will find it to be an interesting experience.

The basic purpose of this study is to just get some idea of what it is like during dinner time in a typical family's home. Just getting the chance to videotape a number of families during their meals can provide us with a lot of very valuable information which might be useful in helping ourselves and other researchers devise new and effective ways of helping people in general to develop better eating habits. Surprisingly, as simple as this may seem, very few researchers have ever actually gone into people's homes during their meals to collect any kind of data at all! Therefore, you are all to be among the first to contribute to a very important and new area of research. Congratulations! When this study is completed I'll also be sure to let you be the first to hear what I have found.

Once this study gets started, you'll see that there is really very little that you will have to do except what you have always done, eat dinner. I'll be asking you (parents), Mr. and Mrs. [ ] to do something else as well that shouldn't prove too difficult and won't take up much of your time. I'll explain this later.

Probably the hardest part of this study for all of you will be having your dinner meals videotaped. This is perfectly understandable and I expect you will probably be uncomfortable at first. However, you will be surprised to find that after a very few times you'll get used to this and the feeling of being uncomfortable should go away. In fact, you will probably very shortly be able to carry on as if nothing is different.

This brings me to one of the most important points. Since this study is interested in finding out what happens at dinner time on a typical day in the life of a family its very important that you do not change anything at all just because you are involved in this study. That is, I want you to carry on at dinner time just as you always have and just as you would if you weren't involved in

this study. Since I've never been to your place at dinner time before, I have no idea what its like; so I'm going to need your help in this regard. One way for you to identify what you might be doing differently once the study starts is to try and think of all the special things you might do if you were having a guest for dinner. If you are doing any of these things during the study, you should stop. This might also save you time and work and make it easier to adjust to my presence. To repeat, all you have to do for this study is really nothing, just carry on as usual.

Now I have a few instructions which are very important in order for this study to be successful. These instructions will also make it easier for you to adjust to my presence, and eventually to carry on as you always have.

1. When I arrive at your home on the appointed nights, if you have any questions they should be discussed either before or after the meal.

2. You should try to ignore the camera being used to record your meals. Just act as if it is not there.

I am not interested in anything you say during dinner, and I will not be recording your conversations.

In addition to videotaping your meals, there is one more thing I would like to do. So that I can get a rough estimate of the kinds and amounts of food all of you will be eating, I'd like to take a few minutes each day before you start eating to record what you will be having, and, if necessary, to weigh or measure your servings of food. Following the meal, I'd like to see what is left on each person's plate and weigh it again. This means that you shouldn't clear the leftovers from the plates until I've returned and had a chance to see them. If you'd like to clear the table right away, I'll give you some tags which you can place on each person's plate to identify which plate belongs to who. Then you can simply stack the dishes in the kitchen until I've had a chance to look at them.

Now I'd like to describe for you more specifically how the study will work so you'll know what's expected of you. I will be visiting your home at dinner time on approximately 10 to 14 different days to set up the camera for recording your meals. I cannot say specifically how long this will take because that will be determined by the kind of data I collect. For example, if I see something which I think might be interesting, I may want to see how many times it occurs, so I might add a few days of observation. Or, it may take some of you a few days more to get used to the camera than others. In any case, the total number of days I will be visiting you will not likely exceed 14, and will probably be no less than 9 or 10. In a few minutes we'll try to work out a schedule, but first there's just one more thing. At some point during the study, I am going to be asking you both, Mr. and Mrs. [ ], to make some small change in your dinner behaviour. This change will be perfectly harmless, it will not be difficult, it will not disrupt your meal or affect the enjoyment of your meal, and it will not have any effect on your weight or health. The kind of change I'll be asking you for will be nothing totally new for you. Rather, I'll be asking you to increase or decrease the number of times you do something which you are already doing anyway. One way to think of this change is to think of it as learning a new skill. For example, the kinds of things I am considering having you try are skills which are thought to possibly give you more control over good eating habits. However, you should know that there are no guarantees that these skills will be beneficial, but it is known that they are totally harmless. I'll be asking you both to try this for a period of at least 4 days. It is important that during those days you try your best to learn this skill. The more quickly you are able to master this skill, the sooner the study will be completed. As I've said, it will really not be very difficult to pick up anyway, and it does not constitute any major change in your behaviour. In fact you may already be using some of these skills occasionally without realizing it. I'll be able to be more specific about what I'd like you to do after I've had 4 or 5 days to record your meals. However, first I'd like to know if either of you have any objections to carrying out this change, or feel that you won't be able to cooperate. I need some kind of a commitment now that you will at least try your best to learn this skill for the entire period during which you are asked to.

O.K., now as I've said, only you two (parents) will be required to try this change. However, should any of your children wish to try as well, that's O.K. I will go over this again when the time comes for you to make these changes.

To summarize, on approximately 10 to 14 different days for the next two to three weeks, I'll arrive at your home at dinner time, set up the camera, and see what you're having for dinner. Then, before you start to eat, I'll weigh and measure everyone's food, and then I'll leave while you eat your dinner. I'll return after you've finished eating, measure your food again, and pack up my equipment. Except for the small change I'll be asking of you parents, there is really little you have to do except allow me to record some information and videotape your meals. In fact the success of this study depends upon your doing nothing different from what you would always do at dinnertime. The study will consist of a maximum of 14 visits to your home by myself, but could be considerably shorter than that. Now before we try to work out a schedule, does anyone have any questions? If at this point, you have any doubts about continuing in the study you should tell me now before we begin."

In answering questions about the study the research assistant should not reveal the hypotheses of the study, nor the nature of the manipulation. All questions should be answered using the information already provided in the above passage, or clarification of that same information.

At all points during this phase the family members should be made as comfortable as possible. There are several messages you should be trying to convey to them as you talk with them. These are:

1. Each family member's paricipation in the study is highly valued by you. They are not just "subjects to be observed" but are valuable, involved members of

the research project. By allowing you into their homes they are contributing essential and valuable information to the project. They should be made to feel as if they too are members of the research team whose cooperation is essential.

2. It should be stressed to the family that, in essence, they really have to do very little apart from allowing you into their homes to record their meals. Their "participation" consists of continuing to do what they have always done.

3. You should offer assurances to the family that while they may find the presence of the video camera uncomfortable at first, after a few days they will adjust to its presence provided they keep in mind the instructions to try to ignore its presence and to not think of you as a special guest who should be attended to.

4. The family should get the message that once you start the study, you have a big investment in them and their continued participation is crucial for the success of the study. It is thus important to encourage them to express any doubts they may have about continuing in the study. If such doubts exist and cannot be dealt with, the family should be allowed to drop out of the study at this point.

Appendix H

Instructions for data collection

Instructions for Data Collection

The research assistant (observer) will arrive at the family's home at a pre-arranged time on the scheduled day. On the first day of observation, the observer will introduce him/herself and ask the family to indicate the seating arrangement of family members during meals. The observer will then arrange with the family a convenient place to set up the video camera. If the seating arrangement is such that the camera does not get a clear view of all family members, the family will be asked to rearrange their seating pattern. Where it is not possible to record all family members, the camera should be set up such that the parents and target child are included in the camera's view. The observer can give any reason he/she sees fit to explain the re-arrangement that will not reveal that he/she is primarily interested in observing the parents and target-child. One explanation might be:

> "We are trying to match all of the families involved in the study on certain characteristics. Therefore, by sitting this way your seating arrangement will more closely resemble other families'."

Once seating is arranged, the observer should give the family the following instructions:

> "We will continue to use the same seating arrangement for the duration of the study. In order to cause you as little inconvenience as possible I'd like to suggest the following procedure for every day I'm here. I will arrive at your home at the pre-arranged time. You should not consider me as a special guest and you should not do anything extra because I'm coming. All you will really have to do is let me in. As soon as I've arrived I

> will set up the camera You may all just go about your business as if I'm not even here. Of course if you have any questions related to the study I'd be happy to discuss them with you.
>
> In order to make it less confusing for me to record your meals, I'd like to ask all of you not to begin eating until I've had a chance to collect some information. I will need to find out before the meal what you'll be having. Then, once everyone has been served, I'll very quickly measure your food servings. Once I've done that, I'll leave until you've finished eating, either to another room, or I'll step outside. Also, if possible, could each person try to remain at the table until they have finished eating. Remember, when the meal is finished, please don't clean your plates until I've had a chance to look at them. Even if you've cleared your plate during the meal, I'd like to see it just so I can be sure I get everyone. The best way to do this would be for everyone to leave their plates in front of them until the meal is over. However, if that is not your normal routine then I'm sure we can arrange something else. I want to disrupt your normal routine as little as possible."

At this point arrangements for viewing plates should be made.

> "Now, once everyone is seated and I've done all that, you all can start eating. During the meal it is important that you try to ignore the camera. You should act as if it is not there. Please feel free to discuss anything about the study with me before and after dinner."

Each day upon arrival the observer should immediately begin setting up and "looking busy." This way, the family will be less inclined to feel they should "entertain" the observer and they will probably feel less uncomfortable if the observer is absorbed in his/her work and not simply sitting there watching the family. Of course, the observer should respond politely to any attention he/she does get from fami-

ly members. Before the meal begins the observer should fill out the standardized data forms (end of this appendix) which will record attendance, etc., and find out what the family will be eating. Once the meal has started, the research assistant should either leave the home, or go to a separate room to wait until they have finished. At the beginning of each session the family members can be asked if they remember what they have to do.

The above procedure will be the same for all observation sessions. Additions to this procedure for the intervention phase are found in Appendix I.

OBSERVATION FORM (to be filled out prior to meal, and during vidotape coding)

FAMILY NUMBER_____ DATE:_____

FAMILY NAME _____ TIME:_____

BASELINE ( ) DAY___ INTERVENTION ( ) DAY___ WITHDRAWAL ( ) DAY___

I. ATTENDANCE AT DINNER

NAME	PRESENT	ABSENT

FOOD SERVED:

_____

_____

_____

_____

_____

_____

DATA FORM - ASSESSMENT OF LEFTOVERS

FAMILY NUMBER: _____ PERSON'S NAME: _____

FAMILY NAME: _____ BASELINE ( ) DAY: _____

DATE: _____ INTERVENTION ( ) DAY: _____

TIME: _____ WITHDRAWAL ( ) DAY: _____

			SERVING	LEFTOVERS	
FOOD TYPE	FOOD**	GROUP	QUANTITY BEFORE	QUANTITY AFTER	QUANTITY EATEN
SALADS *					
MAIN COURSE					
VEGETABLES					
DESSERT					
OTHER					

* For salads, note type of dressing.

** Note if seconds are obtained for any food (indicate with a 2 for seconds, 3 for thirds, etc.)

Appendix I

Instructions for intervention phase

Instructions for Intervention Phase

Once a steady baseline has been observed, the family will be contacted and a meeting with the parents arranged in order to explain to them the conditions of the intervention:

> "For the next several days I would like to ask you (parents) to try to do something a little different at dinner-time. As I promised, this won't be difficult and is perfectly harmless. All I would like you to do is to place your fork down on the table or your plate between each bite of food you take. This is something we all do a little already. More specifically, after taking a mouthful of food, you should lay your fork on the table or on your plate until you have chewed and swallowed each mouthful. This may seem a little unnatural at first, but with practice it should become easier. When you stop to think about what you will be doing you'll realize that there's really no need to have the fork in your hand anyway while you are chewing each mouthful. You can leave your hand near the fork, as long as you are not clutching the fork. That's all there is to it. Let me demonstrate."

The observer should demonstrate with a fork exactly what is required. The hand may rest near the fork while on the table or plate and can even rest on the fork, provided that the individual's fingers are not closed around the fork, and the fork is <u>resting</u> on the individual's plate or on the table. Following this demonstration the observer should continue with the instructions:

> "I would like you to try this during each dinner meal until I ask you to stop. I expect this will last four or five days. (depending on schedule). As I said, you may find it unnatural at first, but with practice it will become easy. Any questions?
>
> O.K., now as I've said, only you two (parents) will be required to try this change. However, should any of your children wish to try as well, that's O.K. The important thing is, if any of your children decide to try this new skill it

should be their own decision. You should neither encourage nor should you discourage your children from incorporating the change themselves. In fact, in order that your children don't somehow feel they are required to incorporate this change, I would like you to try not to discuss what exactly it is you're doing with the children unless they happen to notice you're doing something different and ask you about it. In that case you can simply respond by telling them what it is that I have asked you to do. If the child wants to know if he or she should try to do the same thing, your response should be, "only if you want to."

To summarize, here are a few simple rules which will make this clearer for you.

1. try to put your fork down after every bite during every dinner meal for as long as I ask you to.

2. neither encourage nor discourage other members of the family from trying this as well.

3. try not to directly discuss the change with the children if they don't ask about it. This will prevent the possibility of them perceiving your discussing it with them as demands that they should try too.

4. answer any questions your children may have truthfully. In responding to their questions keep in mind that your children are free to choose themselves if they want to try too.

The reason for these rules is simple. I'd like to see how easy it is for people in different families to learn simple skills at dinner time. At the same time, no two families are the same. Each family has their own unique pattern of dinner time behaviour. That is another reason for this study: to record those different patterns. When I ask you to try out these minor changes I want to disrupt that pattern as little as possible. Thus, if it is natural for your children to want to try too, that's O.K. If it is natural for them to not want to try, that's O.K. too. By sticking to these 4 simple rules I'm hoping that your dinners will continue in a natural fashion and everyone will react or not react to these subtle changes in

> their own way without having any special demands placed on them."

At this point the observer should tell the children what s/he is asking the parents to do. The children should also be told that they do not have to do the same. The children should not be told that they are not to try the intervention.

A typed summary of the above instructions will be given to the parents for them to study (see next page). Following each meal during the intervention phase the observer should provide feedback to the parents on their performance of the instructions in order to correct any obvious misunderstandings of what is required. During the first few days the parents should be given brief praise for their efforts and encouragement if they are having difficulties. None of the children should be given reinforcement of any kind by the observer for also trying the intervention. Data will be collected as in the baseline phase.

Dear Parents:

The following is a brief summary of what I would like you to do for the next four or five days. Please feel free to ask me any questions you might have at any point during the rest of the study. If you should find that you are having any difficulties with these instructions as we continue, please let me know. Thank you.

For the next four or five days I would like to ask you to try to do something a little different at dinner time. As I promised, this won't be difficult and is perfectly harmless. All I would like you to do is to place you fork down on the table or your plate between each bite of food you take. This is something we all do a little already. More specifically, after taking a mouthful of food, you should lay your fork on the table or on your plate until you have chewed and swallowed each mouthful. This may seem a little unnatural at first, but with practice it should become easier. When you stop to think about what you will be doing you'll realize that there's really no need to have the fork in your hand anyway while you are chewing each mouthful. Your hand can rest near the fork while it is on the table or your plate, and your hand can even rest on the fork, provided that your fingers are not closed around your fork, and the fork is resting on your plate or on the table. I would like you to try this during each dinner meal for the next four or five days.

As I mentioned, only you parents are being asked to try this change. However, should any of your children wish to try as well, that's O.K. The important thing is, if any of your children decide to try this new skill it should be their own decision. You should neither encourage nor discourage your children from trying this themselves. If they happen to ask you what you're doing, you can simply tell them what it is that I have asked you to do. If the child should ask if he or she should try to, your response could be something like: "only if you want to ", or, "you don't have to".

A few simple rules may make this clearer for you:

1. try to put your fork down after every bite during dinner for as long as I ask you to.
2. neither encourage nor discourage other members of the family from trying this as well.

The reason for these rules is simple. I'd like to see how easy it is for people in different families to learn simple skills at dinner time. Since no two families are the same, each will have their own unique pattern of dinnertime behaviour. When I ask you to try out this minor change, I want to disrupt that pattern as little as possible. Thus, if it is natural for your children to want to try this change too, that's alright. If it's natural for them to not want to try, that's O.K. too. I would like your meals to continue in as natural a fashion as possible.

--Thank you.

Appendix J

Post-Observation Questionnaire

DATA FORM - POST OBSERVATION PHASE

FAMILY NAME: _____ DATE: _____

FAMILY NUMBER: _____ TIME: _____

NAME	POSITION	D.O.B.	AGE	SEX	TSM	HT.	WT.	CHEST	WAIST	HIPS	THIGH

POST-OBSERVATION QUESTIONNAIRE

FAMILY NUMBER:_____ DATE:_____

PERSON'S NAME_____ TIME:_____

FILLED OUT BY PARTICIPANT ( ) ADMINISTERED VERBALLY ( )

---

1. During this study...

a) were you ever ill? YES ( ) NO ( )

If YES, specify...

Dates of illness(es) _____
_____

Nature of illness(es) _____
_____

b) did you suffer any injuries? YES ( ) NO ( )

IF YES, specify...

Date(s)_____

Nature:_____

c) did you ever go to the dentist? YES ( ) NO ( )

IF YES, specify...

Date(s):_____

Time(s):_____

Was any work done on your teeth?
YES ( ) NO ( )

d) did you ever have any irritations in your mouth such as cold sores, cuts, etc.?

YES ( ) NO ( )

IF YES, specify...

Date:_____

Nature :_____

e) can you think of anything which might have affected your appetite, ability to eat, or your behaviour at dinner time during this study?

YES ( ) NO ( )

IF YES, specify...

_____

_____

_____

_____

2. Were you aware of any changes in any of your children's (or either of your parent's) behaviour during dinner time while this study was being conducted?

YES ( ) NO ( )

IF YES, please describe them...

_____

_____

_____

_____

PARENTS: Do NOT answer question 3. Go to question 4.

3. (a) Did you know that your mother and father were trying something new or different at dinner time?

YES ( ) NO ( )

IF YES--

i) What exactly were they doing that was different? _____

_____

ii) Did you try it too? YES ( ) NO ( )

3. (b) Did you try anything different at dinner time while I was here? YES ( ) NO ( )

IF YES, describe _____

_____

_____

4. Did any of your children try placing their forks down on the table after every bite too? YES ( ) NO ( )

IF YES, who? _____

For how long? (check one)

( ) only at the beginning, when you first tried yourself.

( ) throughout the study.

( ) other _____

5. Did you ever encourage your children to try to put their forks down too? (for children: Did your parents ever...)

YES ( ) NO ( )

6. Did you ever discourage them? (for children: Were you ever...)

YES ( ) NO ( )

7. Were you ever involved in any other weight programs during this study? YES ( ) NO ( )

IF YES, specify..._____

8. Did you start any new diets during this program?

YES ( ) NO ( )

IF YES, when? _____

9. When the study FIRST BEGAN, what did you think the purpose of the study was?

_____

_____

10. Now that the study is over, what do you think its purpose was?
same as above ( ), or....

_____

_____

11. How did my presence, and the presence of the videotape equipment affect you? (i.e. what was it like at first?, did you find you got used to it, or did it become more of a problem?, etc. ...)

_____

_____

_____

_____

12. Did you ever try placing your forks down between bites during other meals? (i.e. breakfast? lunch? dinners when I wasn't here?) YES ( ) NO ( )

EXPLAIN: _____

_____

Thank you very much for your cooperation.

Appendix K

Contradictory Messages Questionnaire

Contradictory Messages Questionnaire

Scoring Procedure

The questionnaire consists of 41 items designed to assess the existence of four contradictory messages. Specific response patterns to the items would appear to support the existence of each of the four messages. There are 26 such response patterns. Table K.1 lists each pattern, the message that it supports, the items involved, the required responses to the items, and the apparent source of the message (i.e., parents or peers).

For example, response pattern 10 requires that the child indicate that (a) he/she must finish dinner to deserve dessert (a "Yes" response to item 11), and (b) he/she is told that he/she eats too many sweets (a "Yes" response to item 9). This pattern appears to support the existence of message A-1 ("Clean your plate if you want dessert, but you're getting too fat from eating too many sweets"). The source of the message is the child's parents.

Many of the response patterns do not appear to support the contradictory messages quite so obviously as pattern 10. In addition, note that some of the patterns require specific responses to more than two items (e.g., response pattern 2).

It is suggested that the identification of one or more response patterns which are clearly consistent with a specific contradictory message indicates that such messages are being communicated to the child by significant others (peers, parents) in his/her environment.

The questionnaire chosen for this study was intended as a preliminary one. Thus, the results should only be considered tentative, and a guide for future study.

CONTRADICTORY MESSAGES QUESTIONNAIRE

* INSTRUCTIONS FOR ADMINISTRATION *

This questionnaire is intended to be administered to children verbally. It should be administered individually to each child and other family members or persons should not be present during the interview. The child should be made to feel comfortable and should not feel that this is a test. Prior to administration the following instructions should be read to the subject.

> "I would like to ask you some questions about yourself. This isn't a test or anything and there are no right or wrong answers, so don't worry about that. I'm just going to ask you some questions about games you like to play, about your friends, and about what it is like at dinner time. You see I'm interested in knowing something about what boys and girls like to do, what they like to eat, and what kinds of friends they have, and games they like to play. So by answering these questions for me you'll be helping me to know more about these things. Now I'm going to be asking a lot of other boys and girls the same questions I'll be asking you, so some of the questions which I have to ask you might seem a little funny, or embarassing, since they might be meant for other boys and girls. Since I have to ask you all of the questions I'd like you to try your best to answer every one, even if some of them aren't really meant for you. O.K?"

Every effort should be made to ensure that the child answer every question.

FAMILY NAME: _____ – CHILD'S NAME: _____

FAMILY NUMBER: _____ DATE OF BIRTH _____

DATE: _____ TIME: _____ AGE: _____

MESSAGE B-4

Play with us to be one of us, but fatties aren't good athletes, so don't play with us.

1. Do you like sports? YES ( ) NO ( )

2. Do people at school or on your block or nearby ever choose you to play on a team? YES ( ) NO ( )

3. Do people at school or on your block or nearby ever tell you that you can't play sports well? YES ( ) NO ( )

4. Do you ever think that you might be a little overweight or fat? YES ( ) NO ( )

5. Are people who are overweight or fat ever good at sports? YES ( ) NO ( )

6. Does a person have to be thin or muscular to be good at sports? YES ( ) NO ( )

7. Do you play after school? YES ( ) NO ( )

8. Do you play at recess? YES ( ) NO ( )

9. Do you play sports? YES ( ) NO ( )

MESSAGE A-1

Clean your plate if you want dessert but you're getting too fat from eating too many sweets.

1. At dinnertime, are you ever told that food is costly and you shouldn't waste it? YES ( ) NO ( )

**2. How often during the week are you told at dinnertime that food is very costly and you shouldn't waste it?

_____

**NOTE: Asterisked (**) questions should only be asked if preceding question is answered YES.

3. At dinnertime, are you ever told to think of those who are starving -- those who aren't as lucky as you? YES ( ) NO ( )

**4. How often at dinnertime during the week are you told to think about people who are starving? _____

5. How often each week are you told that eating sweet things like pie, ice cream, cookies and cake will make you fat or heavy? _____

6. Who tells you, if anyone, that eating sweet things like pie, ice cream, and cake will make you fat or heavy?

_____

7. Do your parents ever tell you that you do not eat enough at at dinner? YES ( ) NO ( )

8. Do your parents ever tell you that you eat too much at dinner? YES ( ) NO ( )

9. Do your parents ever tell you that you eat too many sweets? YES ( ) NO ( )

10. Who, if anyone, ever tells you that you are too fat?

_____

11. To deserve desert, do you have to finish your dinner? YES ( ) NO ( )

12. Who, if anyone, ever tells you that to deserve dessert you should eat all your dinner? _____

13. How often each week are you told to finish your dinner?

_____

MESSAGE A-2

Food is splendour, fat is ugly--but not entirely so.

1. Do your parents ever say that it is bad for someone to be overweight or fat? YES ( ) NO ( )

**2. How many times last week did your parents say that it is bad for someone to be overweight or fat? _____

3. Do your brothers or sisters ever say that being overweight or fat is bad? YES ( ) NO ( )

**4. How many times last week did your brothers or sisters say that being overweight or fat is bad? _____

5. Do you think your mother or father look a little overweight or fat? YES ( ) NO ( )

**6. Are you ever embarassed about it? YES ( ) NO ( )

7. Do you ever act like your mom and/or dad? YES ( ) NO ( )

8. Do your parents ever talk to you about being overweight or fat? YES ( ) NO ( )

9. What does a fancy dinner at your house consist of?

_____

_____

10. How many times last month did you have fancy dinners?

_____

11. Typically, what is served for dinner?

_____

_____

MESSAGE B-3

Eat to be friendly, but best friends aren't fat.

1. How many times a week do you go with your friends somewhere to buy food? _____

2. How many times a week do you go somewhere with your friends to eat something? (i.e. ice cream, candy, MacDonald's).

_____

3. Do friends at school ever give you things to eat? YES ( ) NO ( )

4. Would you ever invite an overweight or fat person for a sleepover? YES ( ) NO ( )

5. Do kids in school ever tease other kids for being overweight or fat? YES ( ) NO ( )

6. Are some of your good friends overweight or fat? YES ( ) NO ( )

7. Do you have any best friends? YES ( ) NO ( )

8. Do you have any best friends who are overweight or fat? YES ( ) NO ( )

Table K.1

List of response patterns for items reflecting

contradictory messages

Response pattern number	Message reflected	Item no.	Items	Response	Source
1	B-4	3	Do people tell you that you can't play sports well?	YES	Peers
		2	Do people choose you to play on teams?	YES	
2	B-4		BOTH OF:		Peers
		1	Do you like sports?	YES	
		9	Do you play sports?	NO	
			ALONG WITH ONE OF:		
		4	Do you think you're overweight?	YES	
		5	Are overweight people good at sports?	NO	
		6	Are only thin people good at sports?	YES	
3	A-1	1	Are you told not to waste food?	YES	Parents
		8	Do your parents ever tell you that you eat too much at dinner?	YES	

continued...

Table K.1 continued

List of response patterns for items reflecting

contradictory messages

Response pattern number	Message reflected	Item no.	Items	Response	Source
4	A-1	7	Do your parents ever tell you that you don't eat enough at dinner?	YES	Parents
		8	Do your parents ever tell you that you eat too much at dinner?	YES	
	A-1	10	Does anyone ever tell you you're fat?	YES	
			ITEM 10 ABOVE COMBINED WITH ANY ONE OF:		
5		1	Are you told not to waste food?	YES	Parents
6		3	At dinnertime, are you told to think of those who are starving?	YES	Parents
7		7	Do your parents ever tell you that you don't eat enough at dinner?	YES	Parents
	A-1	11	To deserve dessert, do you have to finish your dinner?	YES	
			ITEM 11 ABOVE COMBINED WITH ANY ONE OF:		
8		5	Are you ever told that eating sweet things will make you fat?	YES	Parents

continued...

Table K.1 continued

List of response patterns for items reflecting contradictory messages

Response pattern number	Message reflected	Item no.	Items	Response	Source
9	A-1	8	Do your parents ever tell you that you eat too much at dinner?	YES	Parents
10		9	Do your parents ever tell you that you eat too many sweets?	YES	Parents
	A-1	13	Are you ever told to finish your dinner?	YES	
			ITEM 13 ABOVE WITH ANY ONE OF:		
11		8	Do your parents ever tell you that you eat too much at dinner?	YES	Parents
12		10	Does anyone ever tell you that you are fat?	YES	Parents
	A-1		*IF CHILD IS OVERWEIGHT, A YES RESPONSE TO ANY ONE OF THE FOLLOWING ITEMS:		
13		1	Are you ever told at dinnertime that you shouldn't waste food?	YES	Parents
14		3	Are you ever told at dinnertime to think of those who are starving?	YES	Parents

Table K.1 continued

List of response patterns for items reflecting

contradictory messages

Response pattern number	Message reflected	Item no.	Items	Response	Source
15		7	Do your parents ever tell you that you don't eat enough at dinner?	YES	Parents
16		11	To deserve dessert, do you have to finish your dinner?	YES	Parents
17		13	Are you ever told to finish your dinner?	YES	Parents
	A-2	1	Do your parents ever tell you that it's bad for someone to be fat?	YES	
			ITEM 1 ABOVE COMBINED WITH ANY ONE OF:		
18		5	Do you think your mom or dad are fat?	YES	Parents
19		8	Do your parents ever talk to you about your weight?	NO	Parents
20		10	Do you have "fancy" dinners often?	YES	Parents

continued...

Table K.1 continued

List of response patterns for items reflecting

contradictory messages

Response pattern number	Message reflected	Item no.	Items	Response	Source
	B-3	5	Do kids in school ever tease other kids for being overweight or fat?	YES	
			ITEM 5 ABOVE COMBINED WITH ANY ONE OF:		
21		1	Do you often go places with your friends to buy food?	YES	Peers
22		2	Do you often go places with your friends to eat?	YES	Peers
23		3	Do your friends ever give you things to eat?	YES	Peers
			IF THE CHILD IS OVERWEIGHT, A NO RESPONSE TO ANY ONE OF THE FOLLOWING ITEMS:		
24	B-3	4	Would you invite a fat person to a sleepover?	NO	Peers
25		6	Are any of your friends fat?	NO	Peers
26		8	Do you have any best friends who are fat?	NO	Peers

Table K.2

List of response patterns

identified in sample

Target Child[a]	Response patterns exhibited[b]
1	8, 13, 16, 17, 22, 23
2	6, 7, 11, 12, 14, 15, 17, 18, 22, 23
3	2, 3, 8, 9, 10, 13, 14, 16, 18, 19, 20, 22, 26
Sibling of target child 2[c]	1, 18, 21, 22, 23

[a]Target child 4 was not administered the questionnaire because he was too young (4 yr 6 mo) to understand the items.

[b]See Table K.1 for a description of response patterns.

[c]The sibling of target child 2 was non-obese.

Appendix L

Raw Data Summaries

Table L.1

Circumference measures of subjects at Pre and Post-observation phases

Subjects	Chest (cm)		Waist (cm)		Hips (cm)		Right thigh (cm)	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Family 1								
Mother	96.5	96.5	80.0	81.3	113.0	114.3	67.9	68.6
Daughter[a]	58.4	58.4	55.9	53.3	61.0	63.5	35.6	35.6
Family 2								
Mother	97.8	97.8	80.0	80.0	100.3	100.3	57.2	57.2
Son[a]	74.9	74.9	77.5	77.5	81.3	81.3	44.6	44.5
Daughter	64.8	64.8	60.5	60.5	71.1	71.1	38.1	38.1
Family 3								
Mother	88.9	88.9	77.5	77.5	100.3	100.3	61.0	61.0
Son[a]	74.9	74.9	74.9	74.4	81.3	81.3	45.2	45.2
Family 4								
Mother	95.0	95.0	77.5	78.7	105.4	105.4	62.2	62.2
Father	48.0	48.0	100.3	100.3	105.4	105.4	58.4	58.4
Son[a]	49.8	49.8	63.5	63.5	81.3	81.3	39.4	39.4

[a]Target child.

RAW DATA SUMMARY

FAMILY # 1

SUBJECT: Mother

Day	Measure							
	Bites/ min.	Chews/ bite	Drinks/ bite	Forks/ bite	Mean IBI	Chew-time/ bite	No Chew-time/bite	Calories
1[a]	5.80	5.82	0	0.05	10.40	5.64	4.80	540
2[a]	5.16	5.74	0	0.13	11.79	5.63	6.21	258
3[a]	6.03	8.24	0	0.05	10.10	6.83	3.20	448
4[a]	5.81	8.78	0	0.09	10.55	5.03	5.48	240
5[b]	3.02	10.86	0	1.00	20.45	11.39	8.90	586
6[b]	3.85	9.85	0	0.92	15.97	10.03	5.76	340
7[b]	2.49	9.47	0.09	1.00	24.74	9.22	15.31	737
8[b]	2.52	9.88	0.06	1.00	24.23	9.59	14.63	223
9[b]	3.26	9.15	0	0.75	19.04	9.27	9.62	614
10[c]	3.24	9.38	0	0.46	18.81	8.75	10.03	487
11[c]	4.44	6.04	0	0.54	14.02	4.95	8.91	574

Note. Values represent mean levels for each day of observation averaged over entire meal.

[a]Baseline.

[b]Intervention.

[c]Withdrawal.

RAW DATA SUMMARY

FAMILY # 1 SUBJECT: Daughter

Day	Measure							
	Bites/ min.	Chews/ bite	Drinks/ bite	Forks/ bite	Mean IBI	Chew-time/ bite	No-chew-time/bite	Calories
1[a]	4.60	5.51	0.09	0.07	13.24	6.54	6.62	348
2[a]	5.49	6.00	0.02	0.05	11.11	6.81	4.23	345
3[a]	4.46	6.29	0	0.09	13.64	7.08	6.48	421
4[a]	5.05	7.50	0	0.08	12.13	4.66	7.44	240
5[b]	4.63	6.30	0.04	0.15	13.10	7.01	6.04	900
6[b]	5.29	5.16	0.09	0.20	11.56	5.50	5.96	377
7[b]	3.53	4.78	0	0.24	17.15	5.51	11.64	533
8[b]	4.58	4.99	0.10	0.19	13.24	4.73	8.52	428
9[b]	4.54	4.71	0	0.18	13.45	5.71	7.71	449
10[c]	5.62	2.29	0.05	0.24	10.73	2.83	7.91	591
11[c]	4.99	4.37	0.02	0.10	12.21	4.59	7.56	666

Note. Values represent mean levels for each day of observation averaged over entire meal.

[a]Baseline.

[b]Intervention.

[c]Withdrawal.

RAW DATA SUMMARY

FAMILY # 2 SUBJECT: Mother

Day	Measure							
	Bites/ min.	Chews/ bite	Drinks/ bite	Forks/ bite	Mean IBI	Chew-time/ bite	No-chew-time/bite	Calories
1[a]	5.33	4.83	0.11	0.14	11.47	5.17	6.26	275
2[a]	5.88	5.02	0.09	0.07	10.20	5.92	4.37	634
3[a]	8.33	4.71	0.03	0.06	7.27	4.06	3.23	311
4[a]	6.15	5.97	0	0.08	9.94	6.65	3.19	450
5[b]	3.18	11.47	0.19	0.84	19.12	11.31	7.82	528
6[b]	4.55	8.19	0	0.72	13.33	7.52	5.78	606
7[b]	4.48	5.93	0.06	0.36	13.48	5.72	7.78	476
8[b]	3.32	8.58	0.11	0.55	18.37	8.47	9.84	440
9[c]	5.71	7.42	0	0.06	10.53	6.19	4.36	859
10[c]	6.21	6.29	0	0.07	9.79	5.00	4.74	960
11[c]	5.36	7.34	0.06	0.09	11.19	6.79	4.54	289

RAW DATA SUMMARY

FAMILY # 2

SUBJECT: Son (target)

Day	Measure							
	Bites/ min.	Chews/ bite	Drinks/ bite	Forks/ bite	Mean IBI	Chew-time/ bite	No-chew-time/bite	Calories
1[a]	6.81	4.46	0.05	0.10	8.90	3.82	5.05	600
2[a]	6.08	4.37	0.01	0.06	9.92	4.61	5.30	888
3[a]	6.35	2.94	0.10	0.10	9.54	2.41	7.12	505
4[a]	4.63	7.42	0.12	0.12	12.80	6.06	6.99	1200
5[b]	5.33	4.44	0.11	0.21	11.34	4.28	7.07	804
6[b]	2.64	6.16	0.13	0.16	22.92	5.79	16.97	819
7[b]	4.01	4.73	0.10	0.13	15.18	5.01	10.13	476
8[b]	2.53	8.53	0.15	0.05	23.96	7.20	16.73	1100
9[c]	6.85	5.89	0.03	0.01	8.77	4.61	4.19	756
10[c]	5.05	5.94	0.11	0.12	11.92	4.52	7.48	1057
11[c]	6.55	5.00	0.08	0.06	9.20	3.93	5.27	729

RAW DATA SUMMARY

FAMILY # 2

SUBJECT: Daughter

Day	Measure							
	Bites/ min.	Chews/ bite	Drinks/ bite	Forks/ bite	Mean IBI	Chew-time/ bite	No-chew-time/bite	Calories
1[a]	4.06	5.53	0.08	0.40	14.99	5.49	9.53	150
2[a]	2.46	7.26	0.12	0.26	24.75	7.47	17.39	363
3[a]	6.68	4.28	0.01	0.09	9.07	4.23	4.80	378
4[a]	5.63	5.63	0.08	0.06	10.34	4.88	5.87	870
5[b]	6.35	3.93	0.04	0.04	9.49	3.89	5.61	614
6[b]	5.96	3.63	0	0.05	10.16	4.06	6.08	435
7[b]	5.76	5.17	0.03	0.06	10.47	4.95	5.53	392
8[b]	4.15	4.77	0.08	0.02	14.54	4.89	9.66	550
9[c]	7.26	4.80	0.07	0.07	8.32	3.90	4.41	544
10[c]	7.24	6.39	0	0.05	8.33	5.13	3.19	505
11[c]	5.16	6.81	0.07	0.07	11.70	5.43	6.28	553

RAW DATA SUMMARY

FAMILY # 3 SUBJECT: Mother

Day	Measure							
	Bites/ min.	Chews/ bite	Drinks/ bite	Forks/ bite	Mean IBI	Chew-time/ bite	No-chew-time/bite	Calories
1[a]	6.33	7.73	0.03	0.05	9.68	6.52	3.04	243
2[a]	7.42	5.35	0.01	0.07	8.12	4.57	3.56	202
3[a]	5.22	7.11	0	0.03	11.76	5.77	5.90	378
4[a]	5.84	9.28	0	0.02	10.21	8.03	2.29	320
5[b]	3.59	10.69	0.06	0.92	17.11	8.07	8.89	206
6[b]	2.64	15.46	0.03	1.00	23.22	11.89	11.15	353
7[b]	3.31	11.43	0.05	0.86	18.74	10.46	8.03	426
8[b]	2.21	13.00	0.03	0.94	19.10	9.55	9.38	497
9[c]	3.39	9.00	0.14	0.32	18.00	6.82	11.21	346
10[c]	4.80	8.56	0.10	0.28	12.68	6.65	6.01	346
11[c]	4.42	9.69	0.04	0.10	13.86	7.93	5.78	484

RAW DATA SUMMARY

FAMILY # 3 SUBJECT: Son (target)

Day	Measure							
	Bites/ min.	Chews/ bite	Drinks/ bite	Forks/ bite	Mean IBI	Chew-time/ bite	No-chew-time/bite	Calories
1[a]	3.82	9.33	0.02	0.06	15.89	8.17	7.65	573
2[a]	3.52	9.08	0	0.08	17.52	6.72	10.74	193
3[a]	4.06	4.46	0.06	0.09	15.03	3.87	11.11	378
4[a]	3.64	11.20	0.07	0.12	16.49	7.93	8.75	267
5[b]	4.67	6.02	0.02	0.07	13.00	4.96	8.01	252
6[b]	3.20	8.21	0.11	0.13	18.93	6.94	11.94	567
7[b]	1.91	14.20	0.20	0.35	30.88	11.71	20.66	441
8[b]	3.26	11.20	0.06	0.12	18.70	10.15	8.45	599
9[c]	3.79	10.19	0.06	0.11	16.07	8.23	7.74	692
10[c]	4.03	8.66	0.10	0.26	15.10	6.85	8.22	692
11[c]	2.22	14.14	0.11	0.09	27.56	13.30	14.06	457

RAW DATA SUMMARY

FAMILY # 4 SUBJECT: Mother

	Measure							
Day	Bites/ min.	Chews/ bite	Drinks/ bite	Forks/ bite	Mean IBI	Chew-time/ bite	No-chew-time/bite	Calories
1[a]	4.28	9.39	0	0.06	14.17	8.52	5.58	1255
2[a]	6.18	6.36	0	0.06	9.75	4.68	5.09	342
3[a]	5.23	6.50	0	0.09	11.43	5.70	5.83	634
4[a]	4.22	9.47	0	0.11	14.34	7.32	7.11	608
5[b]	2.51	12.92	0.03	0.68	24.37	10.03	14.27	577
6[b]	2.36	13.32	0.08	0.63	25.70	10.87	14.96	760
7[b]	2.61	15.56	0.03	0.79	23.31	13.19	10.10	819
8[b]	2.79	14.86	0.03	0.73	21.74	12.46	9.26	678
9[c]	4.04	7.54	0	0.04	14.93	6.50	8.45	544
10[c]	5.19	10.50	0.05	0.08	11.70	5.70	6.02	470
11[c]	5.09	11.19	0.02	0.05	11.81	7.56	4.30	551

RAW DATA SUMMARY

FAMILY # 4 SUBJECT: Father

	Measure							
Day	Bites/ min.	Chews/ bite	Drinks/ bite	Forks/ bite	Mean IBI	Chew-time/ bite	No-chew-time/bite	Calories
1[a]	6.22	6.31	0.07	0.15	9.69	4.81	4.87	1255
2[a]	7.42	4.43	0.11	0.20	8.15	3.29	4.85	390
3[a]	6.28	3.86	0	0.18	9.64	3.47	6.15	950
4[a]	5.95	4.81	0.01	0.16	10.18	3.77	6.39	1101
5[b]	2.28	16.97	0.16	0.95	26.89	12.08	14.57	737
6[b]	2.46	14.44	0.13	0.90	24.55	10.47	14.26	828
7[b]	2.61	17.71	0.11	0.91	23.38	12.62	10.60	805
8[b]	3.05	11.72	0.28	0.70	19.90	8.32	11.62	484
9[c]	6.69	3.78	0.11	0.16	9.04	3.05	5.97	1236
10[c]	5.16	9.30	0.16	0.21	11.66	5.34	6.44	657
11[c]	6.26	8.03	0.11	0.20	9.66	5.27	4.38	664

RAW DATA SUMMARY

FAMILY # 4 SUBJECT: Son

Day	Measure							
	Bites/ min.	Chews/ bite	Drinks/ bite	Forks/ bite	Mean IBI	Chew-time/ bite	No-chew-time/bite	Calories
1[a]	5.65	4.66	0.01	0.04	10.68	4.73	5.96	896
2[a]	5.02	4.89	0.05	0.14	12.19	4.26	7.86	239
3[a]	5.60	5.85	0	0.06	10.98	4.68	6.21	60
4[a]	5.24	5.44	0	0.03	11.60	3.95	7.69	408
5[b]	6.45	4.77	0.02	0.10	9.40	4.00	5.39	415
6[b]	2.72	13.11	0.06	0.50	22.25	12.07	10.55	486
7[b]	2.58	6.82	0	0.22	23.59	6.30	17.31	591
8[b]	3.61	6.78	0	0.24	16.85	5.71	11.13	294
9[c]	5.37	5.02	0.01	0.06	11.25	4.21	7.03	635
10[c]	5.17	9.28	0	0.06	11.81	5.83	5.96	435
11[c]	5.21	5.70	0	0.03	11.52	4.84	6.78	414