Internal regulation and the evolution of normal growth as the basis for prevention of obesity in children

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We are in the midst of a major shift in our understanding and attitudes about fatness[1] and the treatment of obesity. Emerging from this shift is a profound change in the way we regard and treat childhood obesity.

The current view of fatness is that it is always an unhealthful condition that can and should be prevented or treated. The goal of prevention and treatment is weight loss, to be achieved by negative shifts in energy balance sustained indefinitely. The emerging view of obesity is that the problem is not fatness, per se, but a level of fatness that is abnormal for the individual. In the emerging view, fatness is a normal condition for *some* people. The goal of prevention and treatment is achieving constitutionally appropriate body weight and maintaining this weight through energy homeostasis. The current and emerging paradigms are summarized in the Table.

Many of the current recommendations for children are simply applications of thinking about adults. In the current philosophical and theoretical model, prevention of obesity in childhood has taken the form of early institution of weight reduction dieting with the intent of avoiding fatness. A special report by a National Institutes of Health advisory committee, convened under the name The National Task Force on the Prevention and Treatment of Obesity, defines primary prevention as identifying "individuals who are at risk in order to develop means for preventing them from becoming obese in the future. A secondary prevention goal is that of weight maintenance: That of preventing weight regain following therapeutic weight loss and preventing additional weight gain in overweight individuals unable to reduce" (1, p 572).

The Committee recommends determining which infants have the highest likelihood of developing obesity, intensively studying them, and designing intervention strategies. The Committee also observes that intervention during adolescence offers an "important window of opportunity" to prevention of adult obesity. Interventions cited use behavioral weight control programs as the means of weight management. In brief, the Committee says primary prevention is to start controlling early and secondary prevention is to keep on controlling.

In contrast, the emerging stance is that a fat infant is no more likely to grow up fat than a thin infant (2,3), and that even children who are fat tend to grow in a stable fashion (4,5). Further, the emerging stance is that weight control programs are highly likely to destabilize normal growth processes and, in the long run, make children fatter rather than thinner (6).

CONTROL VS TRUST AS PHILOSOPHIES OF FATNESS

The philosophical position of The National Task Force report and other current prevention models emphasizes control. The assumption about body weight is that it is optional: it can be chosen and achieved. Studies show otherwise. Research about familial tendencies to fatness (7,8), controlled observations about reductions in energy expenditure after weight loss (9), and research findings about a gene for obesity (10) indicate that body weight and fatness are primarily constitutional and protected by powerful biological processes.

However, current attitudes still emphasize control. For example, Leibel et al comment: "Physicians should be aware that for some obese patients the achievement of what is considered to be a more healthful body weight may be accompanied by metabolic alterations that make it difficult to maintain the lower weight. Nevertheless, the beneficial effect of even a modest weight loss . . . justifies persistent efforts at weight reduction and maintenance of a reduced body weight for the treatment of obesity" (9, p 627).

Similarly, studies showing stability and predictability of growth and fatness in relatively fat children have traditionally been interpreted as indicating a need for intervention. National Health and Nutrition Examination Survey data (4) showed that children maintained their relative ranking in skinfold thickness between the two measurements taken at ages 6 to 11 years and 12 to 17 years. Tracking for skinfold thickness was strongly correlated with tracking for height and was a "remarkably persistent characteristic from childhood to adolescence." Zack et al concluded that "identification of excess fatness at 6 years and beyond affords an accurate prediction of adolescent obesity and demands intervention" (4, p 129).

A review of the Ten-State Nutrition Survey examined fatfold data from persons aged 1 through 80 years and showed that fatfold thicknesses in children rose progressively with increases in fatfold thicknesses of the parental mating combinations. Children of two relatively lean parents were the leanest and children of two relatively fat parents were the fattest. Garn and Clark conclude that "the extent to which fatness runs in families represents a challenge in the identification of the obese, the prevention of obesity, the management of those who are obese and the reversal of obesity..." (5, p 455).

In contrast to the current view of fatness, the philosophical position of the emerging model emphasizes trust. Adherents to the emerging view of fatness interpret studies such as those cited above as indicating that for some children and adults, fatness is a normal condition maintained by inherent metabolic and behavioral processes. Given the tendency of these processes to maintain stability, any beneficial effects of moderate weight loss are negated by the high likelihood of regain.

THE DEBATE TAKES SHAPE

As is characteristic of maneuvering preceding a paradigm shift, some views on both sides of the argument become extreme. Traditional proponents tend to be in the medical field and are exemplified by the publication *WIN Notes* from the newly established Weight-Control Information Network of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). Part of the National Institutes of Health, NIDDK

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[1]Even the use of the term "obesity" raises dilemmas. Some maintain that obesity is a medical term implying an abnormal condition leading to ill health. Others say it is merely a descriptive term meaning high levels of body fat. In this article, obesity is used to mean levels of body fat that are abnormal for the individual and is intended to imply no judgments about medical consequences. The words "fat" and "fatness" are used as descriptive terms meaning high levels of body fat.

Table
Issues in the current and emerging paradigms of obesity

Issue	Current "control" paradigm	Emerging "trust" paradigm
Body weight	Primarily optional.	Primarily a genetic given.
Assumption about fatness	Fatness is always bad and should be treated. Everyone should be slim.	Fatness is normal for some people.
Definition of obesity	Weight or body mass index outside a particular range. Children: Above 95th percentile weight-for-height.	Fatness that is excessive for the individual. Unstable growth with excessive weight gain.
Cause of obesity	Overeating and underexercise.	Unknown. Likely genetic predisposition plus multiple environmental distortions.
Solution to obesity	Undereat and overexercise.	Establish consistent and positive eating and activity. Identify and resolve factors that disrupt homeostasis.
Outcome	Achieve a defined body weight or body mass index. Children: Keep them slim.	Behavioral: Positive eating and activity. Let weight reflect energy balance, lifestyle. Let children grow up to reflect their genes.
Recommendation to patient	Manipulate eating and exercise to restrict weight. Keep on manipulating.	Develop the weight that is right for them. For children, provide well for them and keep on providing.

communicates findings from the National Task Force on the Prevention and Treatment of Obesity.

Two private nonprofit organizations have received media attention: the American Health Foundation and the C. Everett Koop Foundation. Both emphasize weight loss and define healthful weight as a body mass index of 25 or less. Koop's high-profile Shape Up America! campaign emphasizes striving for a "healthier weight" and increasing physical activity as major public health priorities.

Proponents of the emerging model of obesity treatment tend to be grouped under the banner of the "Size Acceptance" movement. This group of professionals and lay people emphasizes the virtually universal failure rate of weight reduction efforts (11) and insists that body weight is primarily genetic and metabolic and, therefore, not amenable to treatment. They refute claims that high body weight has universally deleterious health consequences and emphasize negative effects from weight fluctuation secondary to dieting. In fact, they point out that obesity is protective in some diseases (12). Proponents of the emerging model maintain that obesity is less hazardous when it is inherited than when it is acquired (13). They point out that reports and campaigns such as the aforementioned contribute to the increasing medicalization of fatness and the stigmas attached (14), which, in turn, support both the medical and nonmedical weight loss industry. The emerging stance is that lifestyle changes offer an achievable solution to health problems associated with obesity. Among these lifestyle changes are positive and sustainable activity and an end to dieting.

With children the debate is not as polarized. For the most part, professionals working with childhood obesity have recognized that dieting is destructive (6) and have resorted to more indirect methods of management. At a recent National Institutes of Health workshop, "Prevention and Treatment of Childhood Obesity: Research Directions," both private and public sectors appeared to be moving past simplistic views of childhood obesity. Meeting participants recognized both genetic and environmental causes of childhood obesity and emphasized the importance of a multidimensional approach to prevention involving school, communities, health care professionals, and families at risk (15).

However, eschewing weight reduction dieting does not necessarily mean one is a proponent of the new model of obesity treatment, which stresses that children must be trusted to regulate their own energy intake and weight. The "nondieting" approach may involve the use of behavioral weight control methods to manipulate eating and exercise and bring about weight loss. Because these behavioral methods involve more subtle, indirect manipulation of eating and exercise, it is more difficult to make philosophical and theoretical distinctions. The key distinction is that of control vs trust, and, despite the subtleties, it is a profound distinction for children. A child who is controlled learns self-doubt, ambivalence, and dependency, either positive or negative. A child who is trusted learns self-esteem and responsibility.

A RESOLUTION FOR THE DILEMMA

Debates about health consequences of elevated body weight are not likely to be resolved soon. Arguments are convincing on both sides (12), and making a reasoned judgment about who is ultimately right or wrong requires considerably more time and expertise in reading and evaluating the research literature than most clinicians have. However, even if the negative consequences are what the traditional model would have us believe (and my own subjective stance is that they are not), there is nothing we can do about it. We do not have a cure.

As practicing clinicians charged with finding a solution to weight problems in children, we have no choice but to finesse the whole argument, set aside the issue of weight, and turn to what is ethical and possible. As with all treatment, the issue is, first, doing no harm, and second, defining the problem in such a way that it can be solved. In my view, from both perspectives, the trust model has more to offer.

As practitioners, we must understand and support the developmental needs of children and families, as well as develop practical treatment models that can be permanently and comfortably maintained. Achieving these goals is only possible when one is working from a stance of trust. Being trusting allows us to turn our attention away from striving for a particular body weight and turn toward nurturing the whole child. In doing that, we can think about feeding children well, giving them opportunities to be active, providing for their emotional and social needs, and letting them grow up to develop the bodies that are right for them.

However, control is so embedded in how we deal with children and food that letting go of control seems synonymous with going out of control. The converse is true. Children given

adequate support and trusted to regulate their food intake do so accurately and flexibly (16). Being trusting with children's energy regulation offers creative options, from birth on, for prevention of obesity. To clarify those distinctions and possibilities, it is necessary to systematically define the implications of using the trust model to work with children and families.

WHAT IT MEANS TO TRUST WITH CHILDREN AND WEIGHT

The emerging philosophical stance of trust is based on observations that children have tendencies for a particular body build, in addition to food regulation processes and inclinations for movement that support those tendencies (17). Trusting children's innate growth processes allows parents and health professionals to support children with positive feeding interactions and lifestyle patterns that allow them to grow into adults whose bodies reflect their genetic endowment. This trust applies to children who are fat and children who are slim.

Children who show high weight-for-height ratios can be as consistent, reliable, and predictable in their growth as children whose weight-for-height ratio is closer to the mean. Growth curves simply describe, statistically, children's growth. The percentile rankings show the percentage of children who are likely to be at or above a particular point on the growth curve. Statistics say that a smaller number of children are likely to grow at the extremes of reference curves, but their growth is inherently no less "normal" than that of children whose growth is closer to the mean. Clinically, children whose growth plots at the extremes are capable of maintaining stable growth (Satter EM. Normal Fatness in Children. Unpublished data, 1996).

However, the statistical probability of growth at the extremes is lower than the probability of that closer to the mean. As a consequence, children who show high (or low) weight-for-height ratios are often subject to more scrutiny and control by health professionals and parents. This scrutiny can be profoundly disruptive of the child's ability to regulate energy balance and body weight.

A child's task throughout the growing-up years is to achieve and maintain homeostasis, that is, a state of dynamic equilibrium with the environment. Children must eat enough to provide for growth and physiologic needs. They must also have enough stamina to maintain emotional and physical vitality and to take an active role in gratifying psychosocial needs. Both processes involve interaction with the environment. Children depend on a nutritionally and emotionally nurturing environment to support their capabilities with eating and interacting.

Given a positive environment, children can maintain energy balance in response to variations in caloric density of the diet, activity levels, growth patterns, and stresses of living. Given an undersupportive or interfering environment, children have a tendency to make errors in energy regulation (18). The task with feeding growing children is to nurture them so they can accommodate their external environment and respond to their internal processes of hunger, appetite, and satiety (19). The task with parents is to teach and support them so they can feed and nurture well (20).

This is an important intervention, as current parental approaches to feeding make it difficult for children to be able to retain the capacity for internal regulation. Studies show that parents are prone to intrude on the child's prerogative of food regulation. In the longitudinal Western Massachusetts Growth Study (21), 85% to 90% of parents indicated that they determined their child's portion sizes and the amounts they ate at planned meals and snacks. However, children were allowed to help themselves freely to food between meals. On questionnaires, two thirds of parents said they coerced or rewarded their children to eat a certain amount or type of food (Slaughter C. Response to a preliminary feeding dynamics questionnaire in the WIC population. Unpublished data, 1995). An equal number responded that they believed it was the parents' responsibility to ensure their child ate (Davies H. Parent responsibility vs child responsibility in the child's eating. Unpublished data, 1995).

These findings have profound importance for children's eating competence and for their emotional welfare. Young children depend on their parents' presence to let them feel secure enough to regulate their own eating. However, to have autonomy with eating, some children in studies about parental approaches to feeding got too little support from their parents: they were forced to eat when parents were not present. Other children got too little pressure: parents tried to control amounts and types of food children ate.

Too much pressure or too little support makes children less competent with eating. Studies show considerable evidence of children's eating incompetence, which, in turn, appears to have a bearing on their difficulty regulating their weight (2).

Estimates from a variety of settings suggest that incidence of problematic eating behaviors runs as high as 25% to 35% (22) and include such common problems as mealtime tantrums, finickiness, eating too much or too little, and refusing to eat particular foods.

Teaching parents to establish and maintain a positive feeding relationship as a means of obesity prevention can start at birth with positive nurturing of the infant. The principles for optimally feeding fat (or potentially fat) children are the same as for other children, with parents who observe a division of responsibility in feeding with their child (23).

Parents can appropriately take responsibility for providing wholesome and appealing food at predictable and pleasant times. Once they have done their part, parents must trust children to pick and choose from what they have made available and to consume as much or as little as they want. Parents must, further, trust children to grow up to develop bodies that are right for them (19).

Schools and communities can support families in prevention of obesity by helping them to raise children well. Directly related to this task is the need to protect family mealtimes and provide children with safe outlets for their natural inclination to be active and explore. Schools and communities can also help diffuse children's fear of fatness by incorporating size acceptance as part of cultural diversity programming (24).

Helping parents to raise an emotionally healthy fat child is a part of primary prevention. There is no denying or avoiding the considerable prejudice against fat people in our culture. However, as with other targets of prejudice, negative social attitudes most seriously undermine children's self-esteem when parents and other important adults internalize the bias and pass it on.

Fat children have a better chance of growing up to achieve a positive acceptance of their physical identity as a fat person if parents are accepting and supportive of them (25). Fat children, and their parents, need particular help in learning to deal with the prejudice and social and emotional challenges that obesity presents. To be successful in life, fat children must acquire better-than-average social and emotional skills.

Working from a trusting stance is helpful with secondary prevention, as well. Some children get fatter than nature intended them to be, and those children require intervention to correct influences that disrupt their energy balance. However, because they feel they have failed if they are told they have a fat child, parents have a strong tendency to impose food restriction. Further, practitioners fear that any intervention

will precipitate an eating disorder. Many are hesitant to label children as obese, and do so only when obesity is advanced.

The trust model allows a practitioner to make a behaviorally descriptive diagnosis, which, in turn, leads to an earlier and less emotionally charged identification and referral. The problem can be described within the context of monitoring the child's growth as "unstable body weight." The referral's purpose can be to look for and resolve the source of the disruption.

WHAT THE MODELS SAY ABOUT CAUSATION

The assumption in the control model is that children get fat because they eat too much and exercise too little. Recent adjustments in the control model have adhered to the same explanations, but implicated the environment rather than merely the children themselves: there are too many high-fat foods, too freely advertised; there are too few opportunities for exercise; children watch too much TV. This is still control-model thinking because the problem is narrowly defined as food and activity and, thus, forces the solution of getting children to eat less and exercise more.

Viewed from the trust perspective, factors in children's nutritional and physical environment provide a necessary but insufficient explanation for deregulation of body weight. Although these trends of increased availability of foods high in caloric density and decreased opportunity to be active are clear, it does not follow that such environmental influences will overwhelm a child's considerable ability to maintain energy homeostasis. In reality, no straightforward explanations exist for why one child gets fat and another stays thin. Fat children eat no more, or no differently, than thin children (26). In fact, they are likely to eat less (2). Large-scale statistical correlations indicate that watching too much television makes children fat (27), but careful research trials do not support this (28). Fat children seemingly move around less than other children, but they carry more weight and exert the same energy as thinner children (29). Children are ordinarily resilient regulators (30), and can accommodate to school-based shifts in activity and caloric density of food and maintain stable macronutrient and caloric intake, activity, and growth (31).

Although some children lose some weight (generally 10% to 30% of body weight [32]) as the result of interventions that increase their exercise and decrease their caloric intake, this does not prove that overeating and underexercise caused them to gain weight in the first place. Attempts to limit weight gain in childhood are based on the premise that people who learn to manipulate energy balance and leave childhood slim will be slim for life. This does not work. Longitudinal studies in adults (33) indicate that 80% of fat 36-year-olds first became fat as adults. If disproportionate weight gain as an adult is an abnormal condition, one can only assume that at some point, people begin making errors in energy balance.

Similarly, with children, the issue is *disproportionate* weight gain. The assumption in the trust model is that it is normal for children to eat the amount that is right for them, and it is normal for some children to be fat. However, some children do get fatter than nature intended because they begin making errors in energy balance. To understand the cause of these errors, it is necessary to look not only at children's nutritional and physical environment, but also at their social and emotional environment as it is mediated by the family.

It is generally recognized that nonorganic failure to thrive is a disorder of parent/child interaction that affects the child's eating and growth. It is less well recognized that juvenile onset obesity can result from distortions in parent/child interaction (34,35). Children appear to get too fat when they are fed in a restrained fashion (Satter EM. Restrained feeding as a cause of childhood obesity. Unpublished data, 1996), as the result of notable psychosocial disruptions (Satter EM. Psychosocial stress as a cause of childhood obesity. Unpublished data, 1996), and as the result of overfeeding (Satter EM. Overfeeding as a cause of childhood obesity. Unpublished data, 1996). However, children who get fat are presumably genetically vulnerable children. Thin children are also exposed to distorted feeding dynamics. They may get substandard parenting and they may also experience restrained feeding in the form of periodic food insufficiency and yet they do not get fat.

WHAT THE MODELS SAY ABOUT TREATMENT

Although methods are indirect, treatment in the control model involves having children eat less (or consume a diet lower in caloric density), exercise more, and, presumably, lose weight. Treatment in the trust model involves identifying and correcting causes of growth distortions and trusting that children will resume normal growth once disrupting factors are corrected.

Currently, instead of direct manipulation of eating and exercise, the control model uses indirect means of managing children's eating and activity. Weight outcome goals are likely to be modest, for instance, stabilizing weight to allow a child to rejoin a lower weight curve. Indirect means of manipulating energy balance include limiting caloric density of food, instituting behavioral interventions that limit opportunities for eating, and motivating children to be more active.

The trusting stance is that any weight outcome goal, even though it is modest, implies and demands control of the child's energy-regulation and should be avoided. Further, even when controls are indirect, children know when they are being controlled and respond negatively. They get caught up in a struggle with the parent and lose sight of their own needs. The solution in the trust model bases interventions with obese children on positive parenting by feeding children optimally, offering them opportunities for movement, trusting them to eat appropriately and be active, and accepting the weight that evolves as normal for them (23).

On superficial examination, these interventions may appear to be the same as environmental management of the child's energy balance typically used in the control model. However, the distinction lies in the intent. In the trust model, environmental management is used to indirectly manipulate children's energy balance. In the trust model, environmental management is intended to help children accurately regulate energy balance based on their internal cues.

Trusting children means treating the cause of energy and weight deregulation rather than simply managing the symptom of caloric imbalance. When underlying causes are identified and resolved, children can go back to regulation of energy balance and growing in a way that is normal for them.

Structuring treatment depends on whether the cause of the child's weight deregulation is confined to the feeding environment or is related more broadly to the emotional and social functioning of the parents. For instance, a parent might be preoccupied with her own weight and insistent on having her child be slender. That parent will require help with her own eating and self-esteem before being able trust her child's eating. Clinicians can make the distinction by assessing the parents' flexibility and ability to change and organize on behalf of the child. Experienced health professionals are often able to estimate parents' capabilities during evaluation. Other ways to make the distinction include a treatment trial and/or referral to a mental health professional for further evaluation.

When parents are adequately flexible and organized, feeding management involves systematic coaching in optimum feeding. Getting a clear understanding of the tasks and limitations

of their role in feeding empowers parents to stop restraining children's food intake and/or to be consistent about providing children with the nutritional safety and support they need. Children, in turn, stop making errors in energy regulation.

However, parents need additional treatment when they are too rigid to appropriately relinquish control to children or too disorganized to provide children with structure and support. Then it may be necessary to refer parents to psychotherapy or social casework to help them resolve the issues that interfere with their ability to act on behalf of their children.

These referrals should be seen as adjuncts to — not substitutes for — feeding management. Children who have trouble regulating energy intake require optimum feeding. Parents are not likely to be able to generate the complexity of optimum feeding on their own, nor are they likely to be helped to master optimum feeding by most mental health professionals or case workers, who generally have no training in feeding management, and are subject to the same misconceptions and behavioral distortions with feeding as the rest of society.

DOES THE EMERGING PARADIGM WORK?

Whether or not the emerging paradigm works depends on the outcome goal. If the goal of preventive intervention regarding children's weight is the current one of keeping children from growing up fat, probably not. But the proponents of the current model have not kept children thin either, even when those proponents try harder (32). In fact, the current tactics may make children fatter. Externally controlling food intake and activity (whether directly or indirectly) blocks children's sensitivity to internal regulators, undermines homeostatic mechanisms, interferes with optimum social and emotional development, and, ultimately, may make children fatter than they otherwise would be.

But if the goal is doing no harm and helping children grow in a stable and consistent fashion to achieve the adult body that is right for them, then, yes, the emerging paradigm works. Even fat children are in a state of dynamic equilibrium with their environment. Trusting and supporting that equilibrium results in normal growth and it is axiomatic that normal growth works.

Children have their own considerable capabilities related to eating, activity, and growth. Children intuitively use their energy for exploration. The trusting approach is to support their normal growth processes and regulatory abilities rather than trying to outwit them. Working with children rather than against them increases their chances of maintaining stable body weight throughout life. Accepting children's constitutional endowment also enhances the likelihood that they will grow up with positive physical and emotional self-esteem.

References

1. The National Task Force on Prevention and Treatment of Obesity. Towards prevention of obesity: research directions. *Obesity Res.* 1994; 2(5):571-584.

2. Shapiro LR. Results of a sixteen year longitudinal study of children from the age of six months to sixteen years. In: Ikeda J, ed. *Children and Weight: What Health Professionals Can Do About It.* Berkeley, Calif: UC Extension; 1988.

3. Weil WB Jr. Current controversies in childhood obesity. *J Pediatr.* 1977;91:175-187.

4. Zack PM, Harlan WR, Leaverton PE, Cornoni-Huntley J. A longitudinal study of body fatness in childhood and adolescence. *J Pediatr.* 1979; 95:126-130.

5. Garn SM, Clark DC. Trends in fatness and the origins of obesity. *Pediatrics.* 1976;57:443-456.

6. Satter EM. Should the obese child diet? In: Clark KL, Parr RB, Castelli WP, eds. *Evaluation and Management of Eating Disorders.* Champaign, Ill: Life Enhancement Publications; 1988:61-75.

7. Stunkard AJ, Harris JR, Pedersen NL, McClearn GE. The body-mass of twins who have been reared apart. *N Engl J Med.* 1990;322:1483-1487.

8. Bouchard C, Tremblay A, Despres JP, Nadeau A, Lupien PJ, Theriault G, Dussault J, Moorjani S, Pinault S, Fournier G. The response to long-term overfeeding in identical twins. *N Engl J Med.* 1990; 322:1477-1482.

9. Leibel RL, Rosenbaum M, Hirsch J. Changes in energy expenditure resulting from altered body weight. *N Engl J Med.* 1995; 332:621-628.

10. Zhang Y, Proenca R, Maffei M, Barone M, Leopold L, Friedman JM. Positional cloning of the mouse obese gene and its human homologue. *Nature.* 1994;372:425-432.

11. Garner D, Wooley S. Confronting the failure of behavioral and dietary treatments for obesity. *Clin Psychol Rev.* 1991;11:729-780.

12. Sims EAH, Ernsberger P. Obesity is hazardous to your health: affirmative, negative. *Debates Med.* 1989;2:102-137.

13. Ernsberger P, Haskew P. News about obesity. *N Engl J Med.* 1986; 315:130-131.

14. Sobal J. The medicalization and demedicalization of obesity. In: Maurer D, Sobal J, eds. *Eating Agendas: Food and Nutrition as Social Problems.* Hawthorne, NY: Aldine de Gruyter; 1995:67-90.

15. Ikeda JP, Sigman-Grant M. Guest editorial: The 1995 NIH conference on children. *Healthy Weight J.* 1995;9(6):104.

16. Satter EM. The feeding relationship. *J Am Diet Assoc.* 1986; 86:352-356.

17. Rose HE, Mayer J. Activity, caloric intake, fat storage, and the energy balance of infants. *Pediatrics.* 1968; 41:18-29.

18. Satter EM. The feeding relationship: problems and interventions. *J Pediatr.* 1990;117:S181-S189.

19. Satter E. Feeding dynamics: helping children to eat well. *J Pediatr Health Care.* 1995; 9:178-184.

20. Satter EM. Childhood obesity demands new approaches. *Obes Health.* 1991; 6:42-43.

21. Anliker JA, Laus MJ, Samonds KW, Beal VA. Mothers' reports of their three-year-old children's control over foods and involvement in food-related activities. *J Nutr Educ.* 1992;24:285-291.

22. Linscheid TR. Eating problems in children. In: Walker GE, Roberts M, eds. *Handbook of Clinical Child Psychology.* New York, NY: John Wiley and Sons; 1983:616-639.

23. Satter EM. Helping all you can to keep your child from being fat. In: Satter EM. *How To Get Your Kid to Eat . . . But Not Too Much.* Palo Alto, Calif: Bull Publishing; 1987:289-319.

24. Ikeda JP. *Am I Fat? Helping Young Children Accept Differences in Body Size.* Santa Cruz, Calif: ETR Associates; 1992.

25. Bruch H. *Eating Disorders: Obesity, Anorexia Nervosa and the Person Within.* New York, NY: Basic Books; 1973.

26. Rolland-Cachera MF, Deheeger M, Guilloud-Bataille M. Tracking the development of adiposity from one month of age to adulthood. *Ann Hum Biol.* 1987;14:219-229.

27. Dietz WH, Gortmaker SL. Do we fatten our children at the television set? Obesity and television viewing in children and adolescents. *Pediatrics.* 1985;75:807-812.

28. Durant R, Baranowski T, Johnson M, Thompson W. The relationship among television watching, physical activity and body composition of young children. *Pediatrics.* 1994;94:449-455.

29. Huttunen NP, Knip M, Paavilainen T. Physical activity and fitness in obese children. *Int J Obes.* 1986;10:519-525.

30. Birch LL, Johnson SL, Andresen G, Peters JC, Schulte MC. The variability of young children's energy intake. *N Engl J Med.* 1991; 324:232-235.

31. Donnelly JE, Jacobsen DJ, Whatley JE. Obesity and metabolic fitness: effects of a school intervention of nutrition and physical activity. *National Live Stock and Meat Board Food and Nutrition News.* 1995;67:7-10.

32. Peck EB, Ullrich HD. *Children and Weight: A Changing Perspective.* Berkeley, Calif: Ad Hoc Interdisciplinary Committee on Children and Weight. Nutrition Communication Associates; 1985.

33. Braddon FEM, Rodgers B, Wadsworth MEJ, Davies JMC. Onset of obesity in a 36 year birth cohort study. *BMJ.* 1986; 293:299-303.

34. Satter EM. Childhood eating disorders. *J Am Diet Assoc.* 1986; 86:357-361.

35. Satter EM. The feeding relationship: implications for obesity. *National Live Stock and Meat Board Food and Nutrition News.* 1987; 59:59-61.