APPLICATION OF BEHAVIORAL ECONOMIC PRINCIPLES TO TREATMENT OF CHILDHOOD OBESITY

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Obesity is a prevalent problem in childhood (Gortmaker, Dietz, Sobol, & Wehler, 1987), which increases the risk of adult obesity (Stark, Atkins, Wolff, & Douglas, 1981; Abraham, Collins, & Nordsieck, 1971), as well as adult morbidity and mortality (Must, Jacques, Dallal, Bajema, & Dietz, 1992; Nieto, Szklo, & Comstock, 1992). Behavioral treatment procedures have been used with considerable success in treating childhood obesity. Behavioral procedures have been shown to be superior to both no treatment (Epstein, Wing, Koeske, & Valoski, 1984; Israel, Stolmaker, Sharp, Silverman, & Simon, 1984; Kirschenbaum, Harris, & Tomarken, 1984) and attention placebo (Epstein, Wing, Steranchak, Dickson, & Michelson, 1980; Epstein, Wing, Woodall, Penner, Kress, & Koeske, 1985) controls for short term weight control, and behavioral treatments have been successful in maintaining treatment effects over five and then year intervals (Epstein, Valoski, Wing, & McCurley, 1990; Epstein, Valoski, Wing, & McCurley, 1993).

The first generation of treatments we developed were associated with in-treatment (from baseline to six month) percent overweight changes of approximately -15%, with significant differences in maintained weight control over ten years of the same magnitude for families in which both the parents and children were targeted and reinforced for weight loss (Epstein, Valoski, Wing, & McCurley, 1990) and for families in which the parents and children were provided lifestyle or aerobic exercise programs in contrast to those provided a placebo calisthenics control (Epstein, Valoski, Wing, & McCurley, 1993). Over ten years approximately 30% of the children were non-obese, and a similar percentage showed maintained changes of at least a decrease in percent overweight of -20%. These results are among the only in the obesity literature to document successful long-term effects (Epstein, & Wing, 1987), but additional research is needed to improve the in-treatment effects and maintenance of these effects.

One of the most persistent problems in obesity research is the failure to maintain weight loss that is produced by intensive treatments. Newer innovations in treatment such as lengthening treatment (Perri, Nezu, Patti, & McCann, 1989), VLCD (Wadden, Stunkard, &
Smoller, 1986) or pharmacotherapy (Craighead, Stunkard, & O'Brien, 1981), are associated with better weight loss than previous methods, but these improved weight losses are not maintained. For this reason research has begun to focus more explicitly on maintenance, and a variety of techniques have been attempted (Perri, Nezu, & Viegener, 1992). In the most comprehensive research program to date on maintenance of treatment effects for adult obesity, Perri and colleagues have evaluated a variety of treatment approaches, including relapse prevention, continued direct therapist contact, use of phone and mail to maintain contact, exercise, new coping skills development and scheduling of maintenance visits (Ibid). In reviewing research on maintenance Perri suggests that current procedures do not enhance maintenance if therapist contact is removed, and recommends continuation of extended treatment using a continued care model (Ibid).

Behavioral treatments for obesity are based on the assumption that the positive energy balance that causes obesity is due in part to eating and exercise behaviors, and that by changing these behaviors weight change can be induced. There is a substantial empirical basis for the fact that excess caloric consumption beyond energy needs causes obesity, and the production of negative energy balance by reducing caloric and fat consumption and increasing exercise expenditure produces weight loss. What was surprising to investigators was that these changes were so hard to maintain, particularly given the fact that some individuals lose substantial amounts of weight, and show important changes in health risk, which have typically been the reasons that investigators presume to be important for weight loss. One possibility worth pursuing is that the improved health that is presumed to motivate a person to lose weight is incorrect, and other factors, such as appearance, improving social life, having more friends, etc. are more important, and these goals may not be met simply by weight loss. The idea that improved quality of life is an important variable that motivates behavior change has been advanced for other problems (Epstein, 1992; Kaplan, 1990), and may be particularly relevant for obesity treatment.

The fact that subjects change behavior during treatment but return to old behavior patterns after the cessation of treatment suggests two important points about the newly acquired behaviors. First, these behaviors are very context specific, and do not easily generalize beyond the constraints placed on the behaviors by treatment. While it is common to assume that the new behaviors have taken the place of the old behaviors, it may be more consistent with the facts to conclude that new eating and exercise behaviors acquired during treatment become associated with numerous components relevant to the context of treatment, such as coming to meetings, meeting with therapists, having weight measured by others, and the support of the therapist. When the context shifts, behaviors associated with the pre-treatment context are reinstated. There is an extensive animal literature on this phenomena, which has been reviewed recently by Bouton and Swartzentruber (Bouton, & Swartzentruber, 1991). These investigators indicate that when a behavior is not engaged in during treatment, either because the behavior has been extinguished or another behavior has been reinforced to take it's place, the behavior is not "destroyed", but the memory of the behavior remains, along with the memory of the new behavior associated with the new context. The performance of the old or new behaviors depend on which context is retrieved. For example, one of the best ways to remove an old behavior is to reinforce new alternative behaviors (Leitenberg, Rawson, & Bath, 1970; Leitenberg, Rawson, & Mulick, 1975). However, reinforcing a new behavior does not erase the original learning, rather it provides a context for the new behaviors. Thus, when the reinforcement for the alternative behaviors is removed, the rate of the original behavior increases (21,22).

The concept of alternate behavior may be critical to maintenance. Before an obese person begins treatment they have a history of excess intake and decreased activity that is maintained by an extensive set of stimulus and reinforcing conditions. The goal of treatment is usually stated as decreasing caloric intake and increasing exercise. It is also reasonable to assume that these obese persons find food very reinforcing, and do not find exercise very