Every day, all over the world, patients are being advised, instructed, even cajoled or threatened to carry out health-care behaviors (for those sick or injured) or health-promoting (for those “at risk” for illness) in the natural environment, over prolonged periods of time, and with minimal or no input from health professionals. Requiring patients to look after themselves, at least in Western societies, is a cultural convention that follows from biomedicine’s “acute episodes” or “problem-awaiting” perspective. That is, sick people are generally expected to present themselves for medical help and, after receiving diagnostic and interventive care, to return to their homes either to mend, to self-administer further treatment (where feasible), to practice prevention, or to wait for new illness flare-ups. No one, not even the most hypochondriacal in the population, expects physicians to offer continuous, uninterrupted service. Hence, the capacity for self-management of health and illness is presumed, for all but the most severely physically or mentally handicapped or experientially limited.

One might therefore expect a topic as pivotal as self-management to be included in every medical school curriculum or at least be a subject taught to all of us as part of our elementary education. After all, if this capacity is lacking or undeveloped, the health-care system as we know it cannot operate smoothly. Of course, self-management training is compulsory neither for doctors nor for patients. One reason (perhaps the main one) for this apparent oversight is the flawed logic that suggests (a) when doctor’s orders are followed, self-management is self-evidently operating and (b) when patients fail to look after themselves, it is because they are “insufficiently motivated” (i.e., they are not scared enough, not sure enough that they are sick or at risk, or they have learned to feel helpless in the face of stress). The price being paid to verify this line of reasoning is the continued disregard of self-management as a scientific (theory-directed, testable, correctable) enterprise within those domains most likely to benefit from its empirical exploration; namely, medicine, education, and public health.

Although defining self-management will not be easy, let us, for the present, assume that it is a
process by which an individual deliberately employs certain cognitive and/or behavioral skills to facilitate achieving a goal that would otherwise be difficult to attain because social forces or his or her own habits impede or discourage its pursuit. Thus, if a patient was always too busy to engage in certain taxing and time-consuming physical exercises as prescribed by her doctor, the resolve to try to "get control over her life" (i.e., to self-manage) is only expected to succeed if certain cognitive and/or behavioral skills are now brought into play. It should be obvious, however, that a person can attain many unconflicted goals, large and small, without having to exert special volitional control; and, therefore, it would be incorrect to say that in pursuing these goals anything other than simple stimulus-response connections are involved.

Goal attainment per se is not a synonym for self-management! However, in common parlance, this is precisely how the term is often used. Particularly because self-management is a dynamic process that may (or may not) aid in the attainment of a personally valued objective (e.g., a therapeutic health-care activity like jogging, dieting, giving up cigarettes, or engaging in "safe sex"), it is incorrect to assume the prior operation of this motivational strategy by reference only to observed outcomes. This, in fact, is a classic example of the fallacy of circular reasoning or affirming the consequent. When self-management was defined in a recent textbook as referring "to the performance of preventive or therapeutic health care activities . . ." (Tobin, Reynolds, Holroyd, & Creer, 1986, p. 29), even a sophisticated audience might well have been confused.

A problem closely related to the presumption of a self-directive process from its putative effects is the widespread assumption that performing an activity by oneself is necessarily an example of self-management. This misinterpretation is particularly common among marketers of so-called self-help materials (a growing industry, especially in the physical health field). For example, over the years clinical psychologists have found that teaching their fearful, tense, or phobic clients to muscularly relax has had very beneficial consequences (cf. Morris, 1986; Wolpe, 1982). Relaxation exercises can be tape-recorded and given to clients to use as a means of practicing their skills between sessions. However, anyone can now purchase a relaxation tape for their private use under the presumption that faithful listening constitutes self-directed relaxation. This is no more true than would reading the collected works of Freud constitute an example of self-directed psychoanalysis. Proper use of tapes may require a level of self-regulatory skill that the patient may not yet possess. For our present purposes, it is essential to emphasize that when books, recordings, or other devices for handling tension, obesity, cigarette smoking, alcoholism, and the like are sold to consumers as self-management materials, we cannot adequately judge the extent to which self-management, as I have defined it, is involved. The potential exists for both overestimating and underestimating the utility of the approach to be outlined in this chapter, because everyday successes and failures in what is presumed to be self-directed health care can so easily be misattributed, mislabeled, and misunderstood.

Despite what Reaganites might call "disinformation" in the domain of self-directed health behavior, there has been a growing recognition within the medical and allied health-care community of the importance of an empirical analysis of self-influence processes in the day-to-day regulation of health and illness behavior. Several coalescing lines of force provide justification for the current rebirth of patient responsibility as a societal ethic.

In recent years, the cost of health-care and the need to optimize the allocation of scarce economic resources between today's needs and the prevention of tomorrow's ills have become a concern of government, the medical profession, the insurance industry, and the average person. In a country where 750 billion dollars will be spent on health-care (in 1990), where tens of thousands remain underserved while hundreds of thousands with primarily psychosocial needs overutilize medical resources, and where the major causes of illness, pain, disability, and death (namely, cancer, stroke, heart disease, and accidents) are linked to personal life-style choices (e.g., smoking, tobacco use, alcohol consumption, illicit drugs, and the like), it is not surprising that the spotlight has fallen on the individual (cf. Brokowski, 1981; Fuchs, 1986; Healthy People, 1979; Kiesler & Morton, 1988).

Progress and positive forces also have had the effect of reawakening interest in self-directive processes. Changes in patterns of mortality and morbidity away from acute infectious diseases toward long-term, chronic conditions that are treated, for the most part, in the context of home and family (rather than hospital or consulting room) have
contributed to the national raising of consciousness about individual or "life-style" contributors to the quality of life. The consumerist movement has made Americans defensive in their purchasing of products and services, including things medical, and is aided by television and the print media who continue to blitz us with "investigative reports" of fraud and incompetence in the professional community. Finally, the concern with physical fitness and diet has become more than a mere "craze" among many segments of the American population, bolstering the interest in, if not the display of, self-managed health-care.

Of course, it is difficult (perhaps imprudent at this time) to seek to estimate the success of unstructured and unmonitored self-regulatory efforts on the part of the general public. Sociological and epidemiological indicators do not tell the whole story. The publication and sales of self-help books, for example, may be increasing, but we don't know if the books are being read, or if read, understood, or if understood, actualized, or if actualized, indicative of genuine improvements in self-directed health maintenance or illness prevention.

It is fitting, therefore, that we address the self-management of health and illness primarily at the level of cognition, action, and interpersonal process. Particularly important is the question of how effective applied psychologists can be in the design and implementation of training programs to systematically enhance patients' control over their awareness and expression of symptoms, their reaction to illness triggers (e.g., stress, fear), their display of high-risk (usually addictive) behavior patterns, and/or their day-to-day performance of complex and effortful, therapeutic regimes or preventive health-care activities.

Because systematic interventions are (or should be) based on testable concepts regarding the onset and maintenance of adaptive successes and failures, I shall begin with consideration of (a) theory and metatheory in human self-determination and (b) the nature of the hypothesized relationships between self-regulatory processes and health.

CONCEPTUAL FOUNDATIONS

"Self-direction," according to a popular textbook on adjustment (Watson & Tharp, 1989), "means that your own behavior is under your control—that when it is necessary to change, you can" (p. 4). Writing about chronic illness management, Nerenz and Leventhal (1983) proposed the following account of what taking control of oneself actually entails; namely, the idea that the patient is always "actively constructing a definition or representation of his or her illness (or stress) episode . . . and basing or regulating his or her behavior in terms of this representation . . . " (p. 14). Rosenbaum (1988) proposed that representation is best viewed as phase one of a three-phase process of self-regulation that also includes the process of evaluation (appraisal) and a final action phase in which coping or risk-reduction behaviors are initiated. This analytic approach, emphasizing the unfolding of often covert processes, is consistent with the earlier work of Kanfer and Karoly (1972, 1982), Meichenbaum (1977), and others. On the other hand, self-direction, particularly by cognitive means, may be an attribution error, largely the product of our linguistic heritage. As Skinner (1989) sees it:

... we cannot report any internal event, physical or metaphysical, accurately. The words we use we learned from people who did not know precisely what we were talking about, and we have no sensory nerves going to the parts of the brain in which the most important events presumably occur. (p. 17)

Thus, in a Skinnerian manner, Fisher (1986) defined self-control in health as "a social label for those interbehavior relationships by which problem behaviors or temptations are altered in ways that social norms hold to be beneficial" (p. 547).

Each of the above attempts at defining self-management captures the thread of an argument/debate over the essential nature of human function and over humankind's relation to the natural world that, while traceable to the ancient Greeks, impacts significantly not only on modern psychology and medicine, but on contemporary philosophy, theology, law, and education. As the arguments run, we are either free to steer our own course in life or we are not; we are controlled by mechanisms either within us or in the external world; we are either passive in the face of physical forces or we are active in shaping them. Self-management can, therefore, be construed alternatively as a practical set of skills, an internalized array of mental processes, or the end-result of the operation of environmental cues and contingencies whose controlling influence is often inappropriately ascribed to indwelling agents or determinants (such as ego-strength, will power, symbolic processes, self-conceptions, values, intentions, and the like). However, in each case, self-management implies that the actor functions effectively
despite limited contact with or dependence on socializing/authority figures like physicians, psychotherapists, teachers, or parents (Karoly, 1982).

After more than 2,000 years of point and counterpoint, the clear lesson we can draw from debates over the nature of human adaptation is that the framing of the questions, in large part, limits the quality of the answers obtained. For example, assuming that freedom and determinism are diametrically opposing worldviews has, over the years, forced scholars to choose between qualitative versus quantitative models, between descriptive versus experimental methods of analysis, between acknowledging the role of experiential phenomena (such as conscious thought and imagery) or denying their utility. The freedom-determinism dichotomy is simply a misguided meta-theoretic stance. As stated by Bandura (1986),

Self-generated influences operate deterministically on behavior the same way as external sources of influence do. Given the same environmental conditions, persons who have the capabilities for exercising many options and are adept at regulating their own behavior will have greater freedom than will those who have limited means of personal agency. It is because self-influence operates deterministically on action that some measure of freedom is possible. (p. 39)

Thus, instead of conceiving of self-direction as “spontaneous outpourings or outflows, unaffected by tangible factors . . . ” (Nuttin, 1984, p. 189), we allow for causal influence from various loci in addition to the external environment—including biochemical parameters and the cognitive or “personalized” elaboration of experience. This latter set of codeterminants of action involves the processing of information along with the potential for representation or rerepresentation of events in accordance with learned, personal preferences, standards, or goals (cf. Nuttin, 1984, chap. 5).

Similarly, while debate over the “freeness” (unknowableness) of self-directive processes has proven fruitless, so too has the even more common mistake of seeking to localize “ultimate” control over behavior in accordance with a simple, either-or, spatial (inside vs. outside) analogy. Many theorists, particularly those with a radical behavior bent, have aptly criticized the attempt to locate control under the skin or inside the head because the internal causative agent or process is so often linked to its behavioral effect—as when alcoholic “craving” is indexed by drinking or when “commitment to therapy” is measured by appointment keeping. Purists in the cognitive camp, however, point out that no two people in the same setting are likely to perform exactly alike, with much of the difference attributable to their unique perception and understanding of events. Yet, in neither case does it provide much of purchase to apportion control or to rankle over first (ultimate) causes.

Fortunately, a theory of self-management does not depend on resolution of the philosophic locus of control debate. The operant perspective and the cognitive social learning viewpoint need not be pitted against one another because the concern of the investigator should not be to situate control, but rather to determine how best to operationalize multiple controlling variables (cravings or discriminative stimuli) and to select a level of analysis appropriate to the phenomenon at hand.

The levels of analysis approach is especially salient because it recognizes the general utility of multiple viewpoints while acknowledging the special merit of a particular analytic mode as determined by context and investigative intent. When the context involves such demands as the monitoring of bodily events (symptoms), the elaboration of current information in terms of future (delayed) consequences, or the appraisal of input in terms of internalized values or enduring standards, and when the investigative intent is not only to describe, but to set the stage for lasting behavior change, then, I believe, the so-called mediational approach to self-management becomes both relevant and defensible.

Self-management as a set of behaviors that are “obedient” to objectively delimitable environmental or organismic constraints is a valid point of departure (as, for example, when an obese child chooses to refrain from eating dessert in the presence of her diet-controlling mother), but one that loses much of its analytic strength when (a) the conflict is intraorganismic and the environment neutral (the obese child is alone in her bedroom and is deciding between going out for ice cream vs. a piece of fruit), (b) the conflict is intra-organismic and the environment is pulling for “inappropriate” behavior (the drug addict on the street corner), (c) the conflict is based not on competition of cues but on the organism’s perception of temporal incongruity (overindulge now, pay for it later), or (d) the contingencies in the environment are in conflict (a restaurant that offers the would-be cigarette abstainer the choice of smok-
ing or nonsmoking sections). Under circumstances such as these (and others) and when the environment cannot be (ethically or practically) manipulated, a mediational perspective on behavior dynamics seems warranted.

Some readers may be disappointed at this juncture, assuming that I have violated my previous interdiction concerning the either-or assignment of control to the person or the environment. However, I am not claiming that control rests solely or ultimately within the individual; but merely, that, under certain circumstances, the individual is the most sensible focus of analysis. As shall be made clear later, control does not rest at all; instead it is an emergent function of an interdependent network of coacting elements (mind, body, and context). Also, to be perfectly fair to those espousing the positivist (operant) perspective, it should be noted that they have not been oblivious to the question of boundary conditions or to the logic of a levels-of-analysis argument. Baer, Wolf, and Risley (1987), pioneers in the experimental analysis of behavior, have acknowledged that

... the problems of today are not as delimited as those of our beginnings. They are called lifestyles in recognition of their systematic nature. The behaviors called delinquency, substance abuse, safety, exercise, and diet, for example, represent complex classes of topographies serving complex functions involving many agents of reinforcement/punishment and stimulus control all of whom interact to constitute and maintain the system as such. Thus, entry at just one point of such systems is likely to yield only limited, short-term behavior changes. ... (p. 323)

Because, as I have noted, most of the health psychology applications of so-called self-management methods provide a conceptual warrant and a practical, clinical justification for employing the mediational approach, elaborating this perspective shall be the major objective of the present chapter.

Mediational Models

When the reflex arc and the stimulus-response associative bond took their place as the elementary units of motivational analysis in psychology, a number of thorny issues, served by a host of elusive concepts such as volition, self, intention, hope, desire, foresight, preference (value), and the like, seemed to dissolve. The topics and questions articulated fully 100 years ago by William James (1976) were seemingly retired, or left to the musings of philosophers. Yet, while accepting the mechanistic "laws" of learning as highly descriptive of the passive animal in the constrained and predictable world of the laboratory runway, a number of empirically oriented thinkers in the 1960s and 1970s began to resurrect or redefine the Jamesian agenda (if not its conceptual formulations) in order to accommodate the proactive, idiosyncratic, self-conscious, anticipatory, and field-independent manner in which we humans traverse the unmarked and often unpredictable world of personal relationships, long-range (delayed) outcomes, and conflicting social ideals. Stimulus-Response (S-R) connections were supplemented by considering the role of images and plans (Miller, Galanter, & Pribram, 1960), language (Dollard & Miller, 1950; Staats, 1968, 1975), preferences and act-outcome expectancies (Irwin, 1970; Rotter, 1954), attentional focusing and the cognitive transformation of goal objects (Mischel, 1974; Mischel & Ebbesen, 1970), observational learning (Bandura, 1969), and the self-imposition of rewarding and punishing consequences (Bandura & Perloff, 1967; Kanfer & Marston, 1963; Kanfer, 1971).

Information is the basic element within a mediational approach, and its intake, storage, retrieval, and transformation are its basic operations. As far as fundamental units of analysis are concerned, it is proposed that self-regulation of action is built on the individual's apprehension of environmental settings' offering alternative outcomes for alternative courses of action. Beliefs about situation-act-outcome (SAO) probabilities are dependent not only on direct experience, but on information transmitted verbally, imaginally, or via the observation of others. As the person matures, much of his or her activity is dependent on rules (many of which are inaccessible to conscious recall) concerning preferred SAO patterns. Means-end structures in the form of SAO representations are dynamic units in the sense that they respond to information about temporal relationships (an outcome that is rewarding at time 1, but eventuates in an aversive state at time 2), to alterations in environmental contingencies (certain acts, once rewarded, are no longer), to setting fluctuations, historical forces, and the like, and to higher order (hierarchically organized) programs (e.g., a set of actions with predictably positive outcomes may be deferred because they are inconsistent with a self-presentational motive currently activated).

Two different but equally important SAO functions are at the center of human self-directiveness.
The first reflects the capacity to think about the future, to anticipate as well as to simply imagine upcoming SAO sequences. Whether it is called forethought, planning, goal-setting, or is assigned other similar labels, the function involves the inferential processing of information about possible end states (the world, the self, and the self-world relation) in ways that can lead to adaptive change in stagnant or malfunctioning systems. The process by which a self-reflective organism sets its objectives and sometimes even introduces an internal conflict (i.e., a mismatch between desires and current accomplishments) can be termed a command or directive function (Ford, 1987). Its more technical name, in the context of control theory, is the feed forward function.

A complementary function reflects the actor's ability to process information about actual performance outcomes in a tangible manner relative to specific reference values or standards. The creation of stability in self-regulating systems requires this second kind of SAO function in which the consequences of an action are known to (fed back to) the actor for the express purpose of reducing any discrepancy or mismatch between what is desired (the reference value) and what is obtained. This more commonly discussed function is called negative feedback (negative = discrepancy reducing).

For any complex, self-steering organism to operate effectively and to grow in its ever-changing environment, both the feedback and feed forward functions are necessary. As noted by Ford (1987),

> When feedback and feedforward are combined, a dynamic control system potential emerges that can combine information about past, present, and projected future events to guide the flow of its current activity in a variable environment either to maintain or alter its current steady states. (p. 69)

Because feed forward and feedback functions operate in fallible information processors—that is, in human beings—the potential for adaptive control is always in question, subject to the vicissitudes of mechanisms yet to be explored. A number of theorists have offered roadmaps depicting the direct and indirect routes, obstacles, shortcuts, and misdirections that can result when self-management is pursued. I shall review several (though by no means all of the interesting) models of self-direction, highlighting those whose comprehen-

siveness, testability, and relevance to health psychology make them especially useful for our present purposes.

**Kanfer’s Multistage Model**

It has been almost four decades since B. F. Skinner (1953) conceptualized self-control solely in terms of environmental contingencies, and more than 20 years since F. H. Kanfer and colleagues, noting the practical problem of the "initial predominance of available reinforcement for the undesirable response" (Kanfer & Phillips, 1970, p. 413), sought to personalize the process of self-control in order to understand how clinically dysfunctional behaviors with conflicting contingencies (i.e., rewarded in the short run, but punished in the long run) could be handled by the individual serving both as agent and object of change.

To accomplish a modification of a habitual (high-probability) response, the individual was said to make use of the same kinds of devices available to an external agent seeking to modify or shape the behavior of another organism: the ability to sense or detect outcomes, the setting of a criterion of performance, and the capacity to provide response-contingent reward or punishment as a result of either success or failure in matching the criterion. The external monitoring, evaluation, and conseuation processes are taken over by the actor, yielding a three-stage, mediated model consisting of self-monitoring, self-evaluation, and self-reinforcement/punishment (cf. Kanfer, 1971; Kanfer & Karoly, 1972). The three stages, which were originally fashioned in an open or linear configuration, when viewed as a closed-loop (feedback-sensitive) pattern convey the essential elements of a control system, including the requisite feedback functions (knowledge of both the problem-engendering and corrective behavior) and the feed forward function (criterion or standard setting, presumably based on prior learning). Factors hypothesized to facilitate or impede the operation of these self-steering components include environmental inputs, cognitive and metacognitive activities, and physiological/genetic influences and their interactions (Kanfer & Karoly, 1972; Kanfer & Scheff, 1988). The three-stage model was proposed to account for the maintenance of goal-directed action in the relative absence of external contingencies (a process called self-regulation) as well as for the self-directed alteration of behavior under the influence of an immediate conflict or
of conflicting temporal contingencies (a process called self-control).

The practical and heuristic value of the three-stage model continues to register in the applied (clinical) literature and in the emerging domain of health psychology (Holroyd & Creer, 1986; Karoly & Kanfer, 1982; Kirschenbaum & Tomarken, 1982; Watson & Tharp, 1989) despite reformulations and elaborations by Kanfer and his associates and criticisms from other self-management theorists.

Kanfer and Hagerman (1981, 1987) have differentiated the three-stage process into five sequences, the final four of which incorporate hitherto neglected processes: the actor’s attributions of causality or relevance. Let us use as an illustration the case of a person trying to abstain from smoking cigarettes. Once the initial self-monitoring process is activated (as, for example, when a conflictive choice between lighting up or not signals that a “problem” exists), the individual must next decide (sequence 2) whether the cause of the general dilemma is primarily a function of situational, intrapsychic, or biologic parameters (alpha, beta, or gamma variables, respectively). If the attribution is to external causes (e.g., pressure from others) or to uncontrollable physiological factors (an inherited disposition or an illness), then the sequence may stop. If the problem is attributed to such beta variables as personal choice, a lack of willpower or effort, a history of prior bad decisions, or a desire to avoid an early and painful death, then the problem is potentially correctable and the process moves on to sequence three. The criterion selection and performance evaluation stages are entered only if the actor sees the problem at hand as being relevant to his or her “current concerns” (dominant goals). Further, a problem behavior (such as the desire to light up a cigarette) may access either a short-term or long-term concern or goal, and the ensuing evaluation may be impacted differentially as a result of the particular temporal standard invoked. After the evaluation is made of the discrepancy between outcome and reference value, the person enters sequence 4. Again, a causal attribution process is activated, this time having to do with whether the sensed discrepancy is personally or environmentally mediated. As Kanfer and Hagerman (1987) noted,

...our earlier self-regulation model lacked specification of the point at which attributions can affect both the self-evaluative and self-reinforcement processes. Empirical research from various laboratories suggests that subsequent behavior may differ when the individual attributes the discrepancy in reaching the self-set standard either to him or herself or to external events. (p. 301)

Note that the sequence 2 attribution dealt with characterizing the source of the smoking problem in general (“I smoke because I feel I want to”), whereas the sequence 4 attribution focuses on the reason(s) why the actor either succeeds or fails to resist the temptation to smoke. If the sequence 4 attribution is external, then the process terminates. An internal attribution means the sequence moves on to the self-reinforcement/self-punishment stage. The full model is illustrated in Figure 29.1.

It should be mentioned before moving on that Kanfer and his colleagues do not expect that the various attributional decisions will operate in a fully rational manner. Defensive attributions can short-circuit the regulatory process in various ways (implying that interventions based on the model will not likely succeed in the absence of clinical sensitivity).

Carver and Scheier’s Focal Attention Approach

Like Kanfer and associates, Carver and Scheier (1981, 1982) were influenced by cybernetic concepts originating in biology and engineering. Particularly important to Carver and Scheier’s theorizing were the ideas of W. T. Powers, an engineer, whose book Behavior: The Control of Percepcion (1973) presented a sophisticated hierarchical structural analysis of neuropsychological control systems. Also, as in the previous model, Carver and Scheier emphasize the structural importance of the negative feedback apparatus. Important differences emerge, however, with regard to what specific components of the control system are stressed and their hypothesized determinants.

For a system to operate in accordance with the principle of feedback control, there must be a function to detect (sense or monitor) information and one to take the information collected and compare it with the desired state of affairs (the standard, set point, or reference signal). This second function is often called the comparator function and it presumably serves a pivotal motivational role because it triggers actions (behaviors) designed to reduce perceived discrepancies between the input and the reference signal (cf. Miller et al., 1960; Powers, 1973). The activation of this
Figure 29.1. Kanfer and Hagerman's self-regulation model.
comparator has been a central concern in Carver and Scheier's work.

Because self-management comes into play if automatized or habitual behaviors are interrupted or challenged (e.g., a message on the cigarette smoker's package of cigarettes indicates that today's quota has been consumed), it is reasonable to assume that a state of "mindlessness" (Langer, Blank, & Chanowitz, 1978) is replaced by a certain degree of self-reflection or self-awareness. In the absence of self-awareness, the comparator may not engage; hence, the process of action control via negative feedback will fail to be initiated. In their research program, Carver and Scheier have sought to induce self-awareness via environmental manipulations (having subjects appear before an audience or work in front of a mirror) or they have assumed differential propensities toward self-attention as a function of subjects' scores on a paper-and-pencil scale (the Self-Consciousness Scale). It has been shown, in several experiments, that people are more likely to seek out information relevant to their ostensible values (standards, reference levels) when they are made to be focal self-aware (e.g., when seated before a mirror) than when such manipulations are omitted.

Self-focused attention comes into play not only by evoking a behavioral standard but also by motivating the individual to act to reduce any perceived discrepancies between the standard and current input. Carver and Scheier have likewise produced a body of empirical work to support the view that self-focus heightens conformity to salient standards or norms (cf. Carver & Scheier, 1981, 1982).

Finally, Carver and Scheier have highlighted a fundamental aspect of self-regulatory systems—their hierarchical nature—which, although articulated in detail by Powers (1973), appears to have gone unnoticed by many investigators. Basically, the human control system is believed to consist not of a single reference standard, but of multiple standards hierarchically interconnected. The system is so constituted that "each successive superordinate level of feedback systems 'behaves' by specifying reference values for the next lower level of control (Carver & Scheier, 1982, p. 101). Powers (1973) originally proposed nine levels of control, with one's idealized identity and values at the most abstract (highest) level and first-order control systems made up of muscular reflexes (the most concrete level). In answer to the key question, "Which level is functionally dominant at any point in time?" Carver and Scheier argue that the level being attended to is superordinate. When the system is operating properly all levels are being served. This implies that we humans are complex in our goal-directedness: a single action can serve multiple objectives and different reference levels can become superordinate at different times. Among the important clinical implications of a hierarchial model is that it admits to intergoal conflict both within and between levels.

In sum, by emphasizing the role of self-awareness in comparator activation, performance motivation, and hierarchial control, Carver and Scheier have greatly expanded our ability to identify potential sources of self-regulatory success and failure.

Models Emphasizing Feed Forward Mechanisms

Both of the preceding approaches tend to stress postgoal, cognitive-comparison processes. That is, where the person wishes to go is somewhat less important than the feedback-driven process of getting there. However, while discrepancy-reduction mechanisms are clearly necessary, they are only half the story; as I noted previously, the feedback function requires a feed forward function to "drive" it (Ford, 1987). Bandura (1988) has similarly stated that

in the negative feedback control system, if performance matches the standard, the person does nothing. A regulatory process in which matching a standard begets inertia does not characterize human self-motivation... Negative feedback may help to keep (people) going, but it is not present antecedently to start them. (p. 47)

While a distinction between initiation and continued control of motivation is important, it is also necessary to recall that after the first performance feedback, the feed forward and feedback operations are mutually influential, creating what Bandura (1988) calls a "dual cyclic process of disequilibrating discrepancy production followed by equilibrating discrepancy reduction" (p. 47).

Detailing the precise nature of feed forward mechanisms in self-direction is a critical requirement, one that is addressed but not empirically exploited in the previously noted conceptual accounts. Bandura (1988) has recently suggested the following "evaluative agentic properties" as likely feed forward operations: (a) predictive anticipatory control of effort expenditure, (b) self-efficacy attributions, (c) value systems that give rise to af-
fective postperformance reactions, and (d) metacognitive activities (thinking about one's thinking relative to goals, actions, and self-appraisals). Each of these, and others, are disequilibrating in the sense that they function, not to set the organism's motivation energy to zero, but rather to infuse the system with a surplus of information to yield what control theorists call a dynamic equilibrium (cf. Ford, 1987; Powers, 1973). Human self-regulatory systems, unlike machines, are designed to grow and change, not to maintain unchanging order. Self-managing systems add flexibility to the process of adaptation, but not necessarily predictability.

A number of control systems theories, and a number of intervention programs based on these theories, have yet to fully appreciate the elaborative (self-constructing) nature of systems. They seem to focus on an inordinate amount of attention on the content of a person's goal(s) rather than recognizing that it is how one wants, not just what one wants, that determines the success of a long-term self-change enterprise. A number of writers are beginning to formalize the study of feed forward processes in motivation (cf. Frese & Sabin, 1985; Pervin, 1989; Sorrentino & Higgins, 1986); and their research programs may provide the material for improvements in clinical self-change programs in the domain of health (and elsewhere). I shall return to these points in the final section.

Self-Management and Health

The basic tactical rationale behind the current renaissance of interest in individually guided action in health-care was stated forcefully by the Surgeon General (Healthy People, 1979): “It is the controllability of many risks—and, often, the significance of controlling even only a few—that lies at the heart of disease prevention and health promotion” (p. 13).

The unique perspective that each of us has on our own life circumstances renders the self-management approach essential to the success of modern medical technology, which, whatever other wonders it may perform, cannot (and should not) penetrate into our subjective worlds and private lives. Pointing to medicine's relative neglect of patient autonomy, Levy and Howard (1982) have outlined five “domains of patient power” or expertise, whose recognition is considered essential to the humanization of health-care. Patients are said to possess (a) experiential expertise, because only they can feel pain and the early warning signs of incipient disease; (b) integrative expertise, because they must “integrate the multitude of physical as well as interpersonal systems that influence their health and illness behavior” (Levy & Howard, 1982, p. 564); (c) initiator expertise, because consulting a physician represents an advocacy role that only patients can undertake; (d) informative expertise, reflecting the power to give informed consent to medical procedures or experimentation; and (e) implementive expertise, or the power to comply with or to undermine the therapeutic, rehabilitative, or preventive regimens outlined by medical and/or allied health professionals. Thus, Levy and Howard (1982) construe health-care delivery as a bidirectional process, and self-management can therefore be viewed as the patient's contribution to the achievement of society's health agenda.

The patient-centered approach to health is, however, a bounded conception. Self-determination is relative, not absolute; and it is the “system” of which the patient is a vital part that truly “manages” the ultimate outcomes. Arguing too strongly for a self-directional model can sometimes foster a “blaming the victim” mentality. Self-management, likewise, should not be invoked as an excuse for inadequate physician participation (cf. Southam & Dunbar, 1986). Because the self-management credo is ultimately only as worthy as the methodologies/tactics it engenders, we will turn next to a survey of clinical interventions developed (in part) out of the theoretical models reviewed above.

CLINICAL FUNDAMENTALS OF SELF-MANAGEMENT

The mediational models just presented, along with the operant perspective, have been an extremely rich source of ideas for the clinician. At the interventive level of analysis, it has proven useful to view a complex, multilayered process more simply—as a set of interrelated skills capable of being taught (within limits) to children as well as adults (Karoly, 1977, 1981; Mahoney & Arnkoff, 1979). A number of procedures have emerged over the years that have been applied with the general objective of empowering clients to alter problematic response patterns that are either infrequent, beyond the scope of external surveillance, under the influence of cognitive or affective mediation, or highly likely to yield counterregulatory maneuvers if under the express direction of outside agents. A nonexhaustive listing of common self-
management procedures is presented in Table 29.1.

Most of the procedures shown in Table 29.1 can be used for a variety of purposes other than the attainment of effective self-management. However, when a methodology is consistent with theoretical accounts and is employed for the purpose of enhancing self-change or self-maintenance, it can potentially be included. Thus, how an intervention is used is far more critical than the mere fact that it is used. The systematic employment of component procedures such as are listed in Table 29.1 turns out, however, to be a rare event in clinical practice. By systematic, I mean that the techniques are (a) chosen by the clinician after a thorough assessment of the client's specific needs (excesses or deficits), (b) realistic in light of the client's life circumstances, including factors "beyond" his or her control, (c) integrated with the client's existing skills repertoire, and (d) actually utilized by the client in accordance with the treatment plan (e.g., used at the proper time or in the proper sequence).

Given the diversity of available and potential self-management procedures, a conceptually driven categorization scheme is used as an organizational aid. A brief description of each of the seven related types of training (listed in Table 29.2) will be presented next, followed by illustrative examples drawn from the health psychology literature.

**Early-Stage Motivation Enhancement**

The techniques described in this category serve to activate and maintain the patient's desire to change, the expectation that change is possible, and the belief that the potential outcome is worth the effort, cost, or sacrifice involved. Both active and passive forms of "resistance" to change are assumed to be operative in most psychotherapy settings, and, at least early in therapy, some special procedures or tactics are needed to help overcome them (cf. Kanfer & Scheffit, 1988, chap. 5). Later in the therapeutic process, particularly after the enactment of new behaviors produces tangible results (e.g., the dieter loses some weight; the smoker cuts back on the number of cigarettes smoked per day, etc.), then any procedure that contributes to treatment success can rightfully be termed a motivation enhancer.

The use of contracts, task (homework) assignments, and goal-setting/goal clarification methods are among the most effective means of motivation enhancement. They also help to accent several important dimensions of clinical self-management as a philosophy and a technology of change. First, such methods build a conceptual bridge between the consulting room and the patient's extratherapy world where the "real work" takes place. The procedures also highlight the role of the clinician as an essential but temporary facilitator of client change. The explicit statement of goals and the pursuit of specific behavioral objectives by means of newly acquired strategies likewise makes clear to the patient how self-directed change differs from naturally occurring (unplanned) change. Further, these methods should theoretically help to activate the patient's self-evaluative standards and do so at the appropriate level of control. And, finally, the use of such methods emphasizes an all too often neglected aspect of self-management—that it is a temporally extended process rather than merely a technology aimed at achieving a time-bound outcome or product (Kanfer & Gaelick, 1986; Mahoney & Arnkoff, 1979; Shelton & Levy, 1981).

Clarifying the patient's goals and breaking them down into small, achievable subgoals with clear behavioral referents is only a part of the goals analysis, albeit a vital one. Because goals are fundamental units of analysis (both as feed forward signals and as pivotal references in a feedback loop), they merit careful scrutiny throughout all phases of treatment. Goals also are considered basic to the individual's appraisal of self, world, and the self-world reaction; and an appreciation of the contents and organization of the patient's end-state cognitions is likely to provide valuable information about functional and dysfunctional higher order self-governance structures (cf. Emmons, 1989; Karoly, in press; Little, 1983; Pervin, 1989).

**Behavioral Enactment Training**

In many instances, the instrumental behaviors necessary to alter a self-defeating, high-probability response (such as smoking, drinking, overeating) do not need to be expressly taught; they are already in the individual's repertoire. However, the patient may well require assistance in the sequencing of his or her actions and in the selective inhibition/exhibition of well-learned behaviors in the pursuit of long-range (delayed) objectives. Thus, skills practice, mental as well as physical rehearsal, performance feedback (such as provided by a videotape replay), guided participation, relaxation training, and the like may be uti-
Table 29.1. Self-Management Training Strategies Frequently Employed

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<th>Strategy</th>
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<tr>
<td>Goal(s) clarification and specification</td>
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<td>Contracting/task assignments</td>
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<td>Self-monitoring (self-observation and recording)</td>
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<td>Stimulus control (environment manipulation)</td>
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<td>Self-instructional training (for self-cueing or coping)</td>
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<td>Self-generated positive consequences (tangible and/or imagined)</td>
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<td>Self-generated negative consequences (tangible and/or imagined)</td>
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<td>Training in problem-solving/decision-making</td>
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<td>Training in planning/forethought</td>
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<td>Covert conditioning (including covert sensitization, covert modeling, etc.)</td>
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<td>Thought stopping/thought starting (cognitive distraction and/or cognitive activation)</td>
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<td>Reattribution training (including self-efficacy enhancement)</td>
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<td>Attitude modification</td>
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<td>Imaginal rehearsal</td>
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<td>Reinforcer sampling</td>
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<td>Training in the solicitation of social support</td>
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<tr>
<td>Self-directed relaxation (self-hypnosis)/cue-controlled relaxation; meditation; anger control</td>
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<tr>
<td>Performance practice (rehearsal)</td>
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<td>Information acquisition</td>
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<td>Relapse (lapse) prevention training</td>
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<tr>
<td>Training in metacognitive activities (e.g., memory; self-management theory)</td>
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<td>Biofeedback</td>
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lized. Effective self-management depends on what I have called integrated behavioral routines or programs (Karoly, 1985), implying that unless simple component skills (like saying no to drugs) are part of a broader set of action programs articulating what to do, where to do it, when to start, when to stop, and when to resume, they are unlikely to pilot the individual through life’s changing landscape.

Cognitive Regulator Development and/or Modification

Humans transform their experiences, and ultimately themselves, through the symbolic manipulation of information. The information can exist in the form of factual knowledge, judgments or preferences, memories, wishes, or fantasized depictions of “possible selves” (Markus & Nurius, 1986) or “possible worlds” (Stalnaker, 1984). The dynamic control capabilities of people are clearly dependent on the extent and flexibility of cognitive regulatory options, such as those provided by language, visualization, memory, problem-solving, planning, goal-setting, self-reflection, evaluative judgment, information acquisition and retrieval habits, belief systems, self-instructional skills, attention deployment, propositional logic, and a host of capacities often summarized under the umbrella of “intelligence” (cf. Bandura, 1986; Cantor & Kihlstrom, 1987). These cognitive determinants of self-regulatory efficiency are among the most difficult to assess but among the most vital to the long-term success and generalization of clinical interventional efforts. The neglect of such mediators probably accounts for the limited success heretofore obtained in many empirical evaluations of self-management training with adults and particularly with children (for whom the develop-

Table 29.2. Suggested Categories of Self-Management Intervention

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<th>Category</th>
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<td>(a) Early-stage motivation enhancement</td>
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<td>(b) Behavioral enactment training</td>
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<td>(c) Cognitive regulator development and/or modification</td>
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<td>(d) Pre- and postperformance monitoring and evaluation training</td>
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<td>(e) Environmental manipulation</td>
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<td>(f) Affect management</td>
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<td>(g) Persistence training</td>
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mental emergence of information-processing skills is so obviously in need of attention).

As I shall argue in more detail in the final section of this chapter, it is rarely a question of whether an individual is cognitively regulating, but of how and to what purpose. Packaged training programs that seek to enhance specific meditational pathways can, therefore, run afoul of existing, maladaptive regulatory habits left undiagnosed and untreated.

**Pre- and Postperformance Monitoring and Evaluation Training**

Because of the centrality of the negative feedback loop in the emergence of self-management models in psychology, it is not surprising that control functions tied to the feedback reference signal—namely, the information collection and comparator functions—have figured so prominently in clinical work. To function adequately, the self-directive system must access information relevant to the variable being controlled (e.g., the number of cigarettes smoked) and then feed the information to the comparator, where the standard is matched against this input. If corrective action is taken, the information collection function monitors the consequences of said action and again transmits the information to the comparator (Carver & Scheier, 1981; Ford, 1987; Kanfer & Karoly, 1972; Powers, 1973). Thus, the self-monitoring of negatively valenced action (cigarette smoking) and/or positively valenced, incompatible responding (such as cigarette refusal) is an essential clinical tactic.

Self-monitoring is the initial mechanism in multistage theories and has been viewed as prerequisite to other self-change techniques. More accurately, however, self-awareness in the form of a perceptual-cognitive focus on the consequences of one's continued display of health-compromising actions (drug-taking, overeating, use of unsterilized needles, etc.) is the necessary starting point (Karoly, 1980, 1981). Believing that one has a problem precedes the process of counting and recording problematic and corrective responses. However, in most cases, problem recognition occurs prior to the first clinical contact.

Self-monitoring proper refers to the process of attentional tracking of self-relevant attributes—attributes that may reflect emitted actions or behaviors (e.g., keeping count of cigarettes smoked), physiologic responses (e.g., attending to "urges" or "cravings"), biochemical processes (e.g., assessing one's own blood alcohol level), physical status (e.g., weight) or thoughts (e.g., focusing on one's depressogenic cognitions). One can monitor such states or events prior to the performance of some designated controlling behaviors (as when the dieter monitors his or her intentions, urges, or efficacy attributions prior to eating meals), during the performance (counting calories consumed), or subsequent to it (monitoring post-meal levels of satiety or hunger). Self-monitoring depends not only on attention, but also on memory. To concretize the self-monitoring process and introduce a certain permanence into evanescent acts of attention, clinicians have developed methods to assist clients in the collection and storage of self-monitored data. To be maximally useful, self-recording devices must be unobtrusive and conveniently portable.

Currently, self-monitoring and self-recording remain among the most frequently assessed and trained skills in the self-management armamentarium (cf. Holroyd & Creer, 1986; Kanfer & Gaelick, 1986), employed not only for treatment purposes but for diagnosis and planning. As an intervention, self-monitoring has been employed by itself—as a means of interrupting automatized habits such as cigarette smoking—or in combination with other techniques (cf. Karoly & Doyle, 1975; Kazdin, 1974; O'Banion, Armstrong, & Ellis, 1980).

In the preceding discussion of cognitive regulator development and modification, I noted that self-reflective and evaluative tendencies are among the key information-processing operations available to the autonomous and flexible problem-solver. Interestingly, it is quite difficult in practice to clearly separate the act of self-monitoring from the process of evaluative judgment, particularly after the performance of a deliberate (nonautomatic) goal-directed act. Both Kanfer, in his early three-stage model (Kanfer & Karoly, 1972), and Bandura (1986), in his discussion of self-regulatory subfunctions, highlighted the fact that between self-observation and corrective action there exists a set of judgmental processes that determine the form and intensity of self-reactions and subsequent performance.

The complexity of the mediating judgmental processes has not been fully appreciated in clinical applications of self-management theory. Due largely to the influence of control theory, the process of matching-to-standard has been most often invoked as the evaluative subfunction responsible for directing and energizing performance
(Carver & Scheier, 1981). In addition, performance attributions have been recognized as potentially important to self-directed action (Bandura, 1986; Kanfer & Hagerman, 1981). Consequently, goals (standard) clarification and reattributions have been accorded the lion’s share of clinical attention (Ickes, 1988; Kanfer & Scheff, 1988; Miller & Porter, 1988). Notwithstanding the importance of these domains, the fact remains that the diversity of evaluative, self-regulated appraisals that can follow self-monitoring is only beginning to be explored conceptually and clinically. There is, for example, more than one type of performance standard (Bandura, 1986; Higgins, 1987; Karoly, 1985), more than one class of referential anchor (Higgins, 1987; Karoly & Decker, 1979; Miller, Turnbull, & McFarland, 1988), and distinct personal preferences and situational pressures capable of influencing the person’s time-limited choice of judgment frame (Dweck & Leggett, 1988; Schwarzer, 1986). Further, the realism, objectivity, or accuracy of postperformance self-appraisals cannot be assumed.

Environmental Manipulation

Early learning-theory–inspired models of self-management placed a great deal of emphasis on the need to prearrange one’s environment so as to (a) restrict or eliminate exposure to cues that would normally elicit maladaptive behavior or (b) increase exposure to cues that tend to elicit desirable (but low-probability) responses. Thus, the smoker is asked to remove ashtrays from various rooms in his or her home, or to confine smoking to one place and time, or to avoid both smoking and eating. This prearrangement of cues strategy is called stimulus control or stimulus narrowing (see, e.g., Goldiamond, 1965; Mahoney & Thoresen, 1974; Stuart, 1967). Generally, this type of strategy was seen to work best when used in combination with other interventions, particularly those designed to provide incentives for behaviors incompatible with the problem or target (Bandura, 1969). In addition, some investigators included covert cues (e.g., thoughts, urges) as stimuli capable of being controlled in an analogous fashion (cf. Homme, 1965).

Engineering of environmental forces also includes the prearrangement of response consequences. Arranging for significant others to reward adaptive behavior or to punish or ignore ( extinguish) maladaptive responses is an example of such contingency management.

To those who view environmental determinants as distinct from meditational processes, the strategies in this category are erroneously considered to fall outside the self-direction domain, by definition. Or it is believed that the strategy of environmental management requires less self-directiveness than the other types because problems or conflictful decisions are eliminated before they occur, thereby obviating the need to “stare temptation in the face” (Mahoney & Thoresen 1974). However, within a control systems framework, one recognizing the dialectic nature of controlling events, such an analysis clearly falters.

Affect Management

Relaxation, self-hypnosis, biofeedback, meditation, autogenic training, desensitization, anger control, and various fantasy-based procedures can be employed to eliminate the affective reaction tendencies (such as fear, depression, or hostility) involved in the etiology or maintenance of such self-defeating, illness-engendering patterns as the Type A pattern, alcoholism, obesity, or cigarette smoking (Rudestam, 1980). Positive emotions may be viewed either as discriminative interoceptive stimuli linked to prohealth behaviors or they may be seen as naturally incompatible with stress, thus constituting clinical endpoints in their own right (Fisher, 1986). For our present purposes, it is also important to note that aversive or unpleasant emotions are associated with acute illness (e.g., pain) as well as with the day-to-day management of chronic disease (e.g., the fatigue, boredom, frustration, or embarrassment often tied to complex self-care regimens). Notably, the widespread use of emotion-based techniques may stem from a stronger connection to traditional models of psychotherapy (Greenberg & Safran, 1989) than to such theories of self-direction as were earlier reviewed.

Persistence Training

If the mobilization of feedback and feed forward processes is to provide effective solutions to life-style problems, then it is assumed that the underlying skills will remain potent, even if abeyant, and readily applied to novel or unforeseen challenges. Given the trend toward relapse associated with the treatment of addictive disorders and training in health-care compliance (Marlatt & Gordon, 1985; Meichenbaum & Turk, 1987), the credibility of self-management methods is intrinsically linked to their long-term, rather than to their im-
mediate, effects. As stated by Kanfer and Schefft (1988), “When clients learn to regulate their own actions, their dependency on external settings is decreased. Maintenance of gains can be supported by self-generated cues and reinforcements” (p. 62).

At this juncture, it is necessary to invoke an old, but very relevant, distinction—that between learning and performance. Often associated with the debate over whether reinforcers operate by strengthening S-R bonds or by providing incentives to act, the learning-performance distinction nonetheless justifies the assumption that the principles of response acquisition can be meaningfully separated from the principles determining the subsequent display of learned behaviors (cf. Bandura, 1969). In this regard, note that Kanfer and Schefft (1988) claimed only that “maintenance of gains can be supported by self-generated cues and reinforcement” (p. 62), not that such gains will inevitably be so supported. Therefore, although by their nature self-management techniques may possess a greater potential for maintenance, transfer, and generalization, they enjoy no special immunity to the disabling effects of memory decay, environmental disruption, competition of situational incentives, or conflict among activated reference standards in one’s hierarchy of values.

One could add to the myths or misunderstandings about self-management the notion that, once acquired, self-management skills and tactics will inevitably be utilized, and that the problem of relapse or recidivism, having been solved, does not need to be further assessed.

Indeed, a general strategy for maintenance enhancement has been to anticipate the form and intensity of potential (high-risk) disruptive influences (personal, situational, or biochemical) and to train patients to cope with them prior to the termination of therapeutic contact. Included in this general relapse prevention approach is training that ostensibly equips the patient to foresee and forestall high-risk (usually stress-related) events—a kind of lifestyle management or primary prevention effort (cf. Marlatt & Gordon, 1985; Meichenbaum & Turk, 1987).

Having briefly considered the diverse objectives and formats of self-management training, it remains to be noted that the mode of delivery can likewise vary. The procedures I have outlined may be instigated either through direct training, through observational means (e.g., modeling), via mass media (television and newspaper), transmission of information and/or incentives through reading (bibliotherapy), or via some combination of these. The mode of delivery chosen should be appropriate to the nature and accessibility of the target problem. If reducing highway fatalities due to failure to use seatbelts is the self-management objective, then mass media campaigns may well be preferred over the use of individually based interventions. On the other hand, teaching young diabetic patients to monitor their glucose levels and self-inject insulin usually requires direct contact (at least initially) with a health professional.

APPLICATIONS OF SELF-MANAGEMENT IN HEALTH

Contemporary applications of self-management methods in health occur mainly in four domains: (a) chronic illness adjustment, particularly involving medical regimen adherence; (b) high-risk life-style control, typically involving such “addictive,” health-compromising behaviors as overeating, excessive drug or alcohol use, and cigarette smoking; (c) pain management; and (d) regulation of nonaddictive, health-compromising patterns of affectivity, such as depression, hostility, fear, and the so-called stress reactions or psychologically based “illness triggers.” A thorough review of any one of these fields of application would require more than a chapter-length treatment. I will, therefore, provide an overview of the first two (for reading on pain management see Blanchard, Andrasik, Guarnieri, Neff, & Rodichok, 1987; Turk, Meichenbaum & Genest, 1983; on stress and affect management see Olton & Noonberg, 1980; Wickramasekera, 1988).

Self-Managed Adaptation to Chronic Illness

Sustained self-management is mandated for chronic medical conditions treated mainly on an outpatient basis, under the day-to-day guidance of the patient (or the patient’s family), that depend on continued vigilance and corrective action to prevent serious illness flare-ups or physical deterioration. Traditionally, both knowledge (of the disease and how to care for oneself) and motivation (desires, beliefs, and expectancies) have been emphasized by medical sociologists as necessary conditions for effective self-ministration, acting in concert with illness characteristics (e.g., Becker & Maiman, 1983). However, viewing self-management as a dynamic, self-constructive, socially embedded process requires that a complex task-
analytic approach be undertaken to gauge the multiple goals and life demands acting on the patient, both generally and with respect to the illness. The patient's skills and skill deficiencies, along with the supportive and obstructive characteristics of the social and physical setting, need to be assessed and remediated as well. Finally, an appreciation of and training in specific cognitive and metacognitive operations associated with the feedback and feed forward system functions are entailed (particularly with children for whom age-related or experientially based attainment limitations place unique boundaries on the potential for self-direction).

Although no clinical intervention program has yet articulated and operationalized all of the elements I have ascribed to systematic self-management, a growing body of literature exists in which one or more training modalities have been employed to assist chronic patients to cope with one or more of the adaptive tasks of illness. Based on self-management models and extant conceptions of illness coping (e.g., Moos & Schaefer, 1984), Table 29.3 illustrates the compass of actual and potential applications. Many of the cells of the 7 (methods) by 10 (tasks) matrix are presently unexplored; yet sufficient light has been cast to justify our critical attention.

**Diabetes**

Insulin-dependent diabetes mellitus (IDDM) is a disease characterized by chronic high blood glucose concentration due mainly to destruction of the beta cells of the pancreas. Because the blood glucose concentration cannot be biologically self-regulated (as is the case in the nondiabetic), behavioral self-regulation is called for, usually in the form of a complex self-care regimen consisting of the self-measurement of glucose levels, single or multiple daily injections of insulin, diet and exercise regulation, and other patient-managed activities (Cox, Gonder-Frederick, Pohl, & Pennebaker, 1986; Pohl, Gonder-Frederick, & Cox, 1984; Surwit, Feinglos & Scovenn, 1983). Described by Pohl et al. (1984) as "a nearly pure example of behavioral medicine" (p. 6), the self-care of IDDM can hardly be considered successful in the absence of educational and psychological intervention, as the rate of regimen noncompliance is quite high (Surwit et al., 1983; Wing, Epstein, Nowalk, & Lamparski, 1986).

Reasoning from a control theory perspective, Wing et al. (1986) suggested that the methods articulated in Kanfer's three-stage conception (Kanfer & Karoly, 1972) could be brought to bear on tasks 1, 2, 4, and 8 (as listed in Table 29.3). These methods include self-monitoring and self-evaluation (category d, Table 29.2) and self-reinforcement (category c cognitive regulator).

As the process of error detection is seen as the "most important element of self-regulation system" (Wing et al., 1986, p. 79), blood sugar and urine monitoring have received a great deal of attention in terms of their accuracy and compliance rates. The most common method of self-assessment, urine testing, does not provide a sensitive index of blood glucose (BG), as it only measures excess amounts of the substance that have spilled into the urine, and a "negative test yields no information concerning BG levels below the renal threshold" (Gonder-Frederick, Cox, Pohl, & Carter, 1984, p. 12). Thus, the use of a self-administered blood test, wherein the patient pricks his or her finger and places a droplet of blood on a chemically-treated strip, is widely encouraged. By comparing the reagent with a color chart (or by using a reflectance photometer) the patient can obtain accurate and relatively immediate feedback about blood glucose levels—including dangerously low levels (hypoglycemia). Accurate feedback permits what are called flexible insulin regimens to be instituted. That is, corrective responding in the form of diet or exercise modification or the administration of insulin can be precisely attuned to the body's momentary needs, rather than being employed in accordance with a prearranged, daily schedule.

Better self-monitoring is, unfortunately, complex and error prone, and methods of improving the use and accuracy of blood glucose monitoring are now beginning to be developed. Further, because error detection alone does not constitute a self-regulating system, researchers also have stressed the need to train corrective or "controlling" responses in addition to blood glucose or urine monitoring. Diet, exercise, stress, and insulin adjustments (tasks 2, 4, and 8) are the adaptive responses most often studied (cf. Wing et al., 1986; Zinnman, 1984) as instigated by direct training, information-giving, goal-setting, modeling, contingency-contracting, relaxation or meditation methods, and intensified medication and enhanced supervisory control (Cox et al., 1986; Geffner, Kaplan, Lippe, & Scott, 1983; Gross, 1982; Rose, Firestone, Heick, & Faught, 1983; Schafer, Glasgow, & McCaul, 1982). Neither the
Table 29.3. Matrix of Self-Management Interventions Applicable to the Varied Adaptive Tasks of Chronic Illness Adjustment

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<td>early-stage motivation enhancement</td>
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individual nor the combined potency of these motivation-enhancement, performance-monitoring, affect-management, and/or environmental-manipulation techniques is yet firmly established owing to the frequent use of small (possibly unrepresentative) clinical samples, the potential for self-report bias, the differences in measures of glycemic control employed, the lack of standardization in the training procedures used, and the failure to assess whether the techniques taught were actually learned or utilized by the study participants (both during the training and at follow-up).

The most frequently discussed cognitive regulators are goal-setting and self-reinforcement. In most cases, however, the use of symbolic, internal mechanisms is an inference to be drawn from the initial external manipulation of objectives and reinforcers (by physicians, nurses, or parents). By negotiating contracts and instituting point systems for the distribution of tangible rewards, the therapist uses early-stage motivation-enhancement procedures to “set the stage” for subsequent covert self-guidance (e.g., Schafer, Glasgow, & McCaul, 1982). Unfortunately, the systematic and verified use of symbolic regulators has not yet been empirically established in the domain of diabetes-regimen adherence. On the one hand, such a step may be superfluous if, as has been suggested, contingency-contracting and goal-setting per se are sufficient to ensure adherence (Cox et al., 1986). Yet, theory would propose that for a lifelong pattern to be established in a diverse and changing environment, some internalization of values and meanings and the use of self-generated cues and reinforcers would be required (Kanfer & Karoly, 1982; Karoly, 1982). Establishing the role of cognitive regulators in chronic illness adjustment is a logical prerequisite to the clinical training of such strategies; and some preliminary data are available. Tennen, Affleck, Allen, McGraw, and Ratzan (1984), for example, reported that children (mean age = 11.2 years) who manifested a feeling of personal responsibility for their diabetes (so-called behavioral self-blame) were rated by physicians as coping better and were under better metabolic control (assessed biochemically) than were children who manifested an external cause orientation. Studies employing locus of control indices, on the other hand, have tended to reveal that internality is a counterproductive orientation insofar as metabolic control is concerned (Burns, Green, & Chase, 1986; Rainwater, Jackson, & Burns, 1982). Clearly, a number of factors, such as the patient’s age, time since diagnosis, the status of the disease, family systems parameters, and the like, may converge to determine which attributional style will have what effect for which disease entity. Nonetheless, attributional processes do relate in important ways to illness adaptation. Judgments of self-efficacy, for example, correlate with or affect a patient’s choice of action, energy mobilization, stress reactivity, and the direction of cognitive regulatory efforts (cf. Bandura, 1986; chapter 4 in this volume).

In a study of goal-oriented cognition among diabetic youngsters, Karoly and Bay (1990) found that children (mean age = 14) could distinguish between self-selected and imposed self-care goals, and that goal dimensions (determined factor analytically) are capable of accounting for significant variance (31%) in metabolic control (indexed by means of hemoglobin assays). Interestingly, only the socially-referenced goal factors were predictive of metabolic control, suggesting that youngsters (mostly preadolescents) do not rebel against the fact of health goal socialization, but may react adversely to the form in which it is offered (i.e., a factor labeled “coercion” was significantly negatively related to metabolic control).

Other Chronic Conditions

Attempts to utilize a self-management perspective have not been confined to diabetes. Applications to such illnesses as asthma, hypertension, and gastrointestinal disorders (and others) are described in Holroyd and Creer’s (1986) edited volume. While most programs tend to make use of categories a, d, e, and f interventions (see Table 29.2), inroads into higher order mediational dimensions are being made.

In their study of self-directed hemodialysis, for example, Kirschenbaum, Sherman, and Penrod (1987) sought to increase self-directedness in four elderly patients with chronic renal disease through a multidimensional training program that included the provision of a conceptual rationale and the use of a “decisional balance sheet” procedure. The latter incorporated an assessment of advantages versus disadvantages of taking over the setup and use of a dialysis unit, and an “awareness of rationalizations” procedure designed to counter the convincing, but manageable disadvantages that the patients might have envisioned. Thus, although this process might be la-
beled an early-stage motivation enhancement, the emphasis on building a "top-down" conceptionalization of self-management also serves to mark it as an imaginative approach to cognitive regulation. The long-term effects of the training were not assessed (cf. also Witenberg, Blanchard, McCoy, Suls, & McGoldrick, 1983).

Tasks other than symptom-monitoring and medication or procedural compliance can and should be targeted via self-directed means. For example, the regulation of diet and exercise regimens has been pursued, both in the context of chronic illness (Wing, Epstein, & Nowalk, 1984; Zinman, 1984) and within a health promotion framework (Belisle, Roskies, & Levesque, 1987; Epstein, Wing, Valoski, & Devos, 1988) using interventions that reflect some (though not all) of the components of a self-management perspective. Because the need to control weight and maintain aerobic fitness levels may remain as lifetime goals, persistence training procedures should see increased utilization in the years ahead. Of course, the same is true for symptom-monitoring and medication adjustment; and, thus, in these areas, relapse prevention methods should likewise find a fertile soil for application and elaboration.

In sum, the employment of the seven related self-management approaches to assist patients in dealing with the multiple tasks of adjustment to chronic illness is a developing enterprise, supported mainly by single case experiments and small N research, usually with convenience samples. To collect on the promissory note that self-directive methods represent, future research must attend more closely to methodological issues and seek wider penetration into the methods-by-tasks matrix.

High-Risk Life-Style Management

Heavy alcohol consumption, cigarette smoking, overeating, and leading a sedentary life are widely recognized as placing the person at risk for a variety of medical disorders and for shortening life expectancy (Healthy People, 1979; Matarazzo, Weiss, Herd, Miller, & Weiss, 1984). Further, from the initial stages of the behavioral health movement, self-management methods were identified as essential in the control or prevention of various health-compromising life-style patterns (Farquhar, 1987; Knowles, 1977; Mahoney & Arnkoff, 1979; Schwartz, 1979). Having thus enjoyed a long tenure in the field of high-risk behavior, self-management methods have been allotted considerable empirical scrutiny and ample time, some would say, to prove themselves. They have not. Or, to be more explicit, self-management methods work as well as most so-called cognitive-behavioral interventions and better than many traditional forms of behavior change. What they do not do is provide for a permanent resolution of addictive disorders. The reasons for their failure, however, can be quite instructive.

The standards of proof in the case of therapeutic self-management would appear to be set at a higher level than those imposed for most other forms of clinical intervention. Because the addictive behaviors against which self-management procedures are directed have had a notoriously high rate of relapse or recidivism (Hunt, Barnett, & Branch, 1971; Leventhal & Cleary, 1980; Marlatt & Gordon, 1985; Shiffman, 1982), the treatment is usually judged in relation to problem levels at 1, 3, or 5 years posttermination.

Hall (1980) pointed to the problem of treatment implementation, suggesting that complex procedures require time, patience, and clinical experience to be rendered fully operational.

... [the] failure of self-management behaviors to be maintained is due to the relatively short time periods in which new behaviors are taught and practice is encouraged ... Since these behaviors are to supplant those the individual has employed throughout life, it has been argued that a relatively long treatment period ... must be employed. (p. 276)

She also remarks that we generally know very little about the factors responsible for long-term success, when it is achieved, and wonders whether failures reflect a lack of learning of self-management principles or a client's disinclination to use them over time (the learning-performance distinction once again).

Further, although behaviorally oriented investigators were initially drawn to disorders such as obesity and alcoholism in the late 1960s and early 1970s, partly as a result of their ability to assess clinical outcomes in reproducible and reliable ways (e.g., pounds lost or blood alcohol level), contemporary self-management investigators are increasingly cognizant of the biopsychology of addictions and eating disorders. Alcoholism researchers can point to familial (genetic) transmission, possibly having to do with an inherited ability/ inability to metabolize ethanol; drug re-
searchers posit conditioning of positive affective states, mediated cortically (the dopaminergic ventral tegmental system), linked to drug-acquisition behavior; whereas researchers of eating disorders are investigating serotonin dysregulation in bulimics, and a loss of interoceptive control over eating in the obese (cf. Baker, Morse, & Sherman, 1987; Hill, Steinhauer, & Zubin, 1987; Mitchell & Eckert, 1987; Polivy & Herman, 1987; Schuckit, 1987).

Finally, we can (with hindsight) criticize first-generation self-management enthusiasts for their neglect of the emotional interpersonal and cultural contexts in which life-style problems are played out in their zeal to target readily delimitable, instrumental responses. Only recently has the complexity inherent in the concept of life-style been recognized and addressed. Bruhn (1988), for example, views behavior as one component of life-style that is contained within an individual's philosophy of life. The latter is ecologically embedded and a developmentally emergent product of socialization. Thus, health beliefs and habits are shaped by the physical environment (why give up smoking if the air is polluted?), by cultural values (good health is a commodity that can be bought), by subcultural realities (good health is a commodity that the poor cannot afford to buy or make time for), by social (peer) pressure, and by personal factors, such as a sense of mastery or control. As we know comparatively little of the natural history of health-relevant life-style socialization across diverse segments of our society, clinical programs designed simply to encourage one type of behavior (e.g., abstinence from premarital sex; the wearing of seatbelts) or to discourage others (e.g., drug experimentation, purging in order to keep weight off) are likely to face an uphill battle.

The overall lesson to be drawn from the limited successes of first-generation self-management forays into life-style modification is that the pursuit of high-risk pattern regulation (prevention or control) should be an interdisciplinary enterprise. If not yet truly inter- or multidisciplinary, the contemporary self-management literature at least reflects a genuine respect for the field of interacting forces that impinge on the at-risk child and adult.

The smoking cessation research currently being conducted illustrates the new look in self-change psychology (contemporary efforts at enhancing the persistence of therapeutic learning are discussed in a separate chapter in this handbook).

**Smoking Cessation**

The important developments in this domain have included efforts to understand the natural history of smoking—particularly the determinants of initiation, self-quitting, and relapse.

Among the important insights of recent years is the view that addictions and other health-compromising habits may best be described in cyclical process terms rather than in static, categorical terms (Prochaska & DiClemente, 1986; Prochaska, Velicer, DiClemente, & Fava, 1988). For example, I have found it helpful to view self-defeating life-style patterns as multiphasic processes consisting of (a) initial exposure and use, (b) habit development and maintenance (automaticity phase), (c) preparation for change (includes several subphases), (d) habit cessation, (e) maintenance of cessation, (f) a lapse-relapse pattern, (g) recovery of cessation, (h) cycling between f and g, including experimentation with different controlling devices, (i) development of incompatible habit patterns, and (j) maintenance of healthy life-style. Some individuals do not stray past point a. Some end the process at point e. But many traverse the longer sequence, some never moving beyond point h, and some eventually becoming successful life-style managers (at least with respect to their former problem). The clinician's choice of intervention (self-management or otherwise) cannot be arbitrary or narrowly conceived and needs to be sensitive to environmental and patient readiness variables.

Prevention efforts, aimed at phases 1 and 2, are highly desirable (Evans, 1984) and depend on both cross-sectional and longitudinal studies of child and adolescent motives regarding smoking and the determinants of smoking initiation (e.g., Chassin, Presson, Sherman, Montello, & McGrew, 1986). The research of Chassin et al. (1986) on the role of parent and peer influences, for example, illustrates that a sweeping "Just Say No!" campaign would benefit from knowledge of whom to say no to and when.

Similarly, after a habit has developed, it would be helpful to know where the person is in the evolving process of change and what change strategies would be maximally helpful to employ. Prochaska, DiClemente, and colleagues have made strides in addressing these questions. Their model highlights four stages in the change process—pre-contemplation, contemplation, action, and maintenance—and 10 processes of change (assessed by means of a 40-item Processes of Change Ques-
tionnaire). They include a relapse phase and the possibility that individuals will cycle between relapse and cessation (a so-called revolving door model). Their processes-by-stages approach (analogous to the methods-by-task analysis I suggested in the previous section) has revealed an abundance of clinically useful data. For example, across several problem areas (psychic distress, smoking, and weight control), it was shown that helping relationships, consciousness-raising (e.g., being mindful of the problem), and self-liberation (e.g., self-instruction) were the highest ranked self-change methods and reinforcer management and stimulus control the lowest ranked (Prochaska & DiClemente, 1986).

Other recent studies, focusing on naturally occurring events in the process of self- and/or therapeutically assisted change have likewise proven theoretically and clinically provocative. Both cognitive factors and interpersonal exchange processes have emerged as promising avenues of exploration. Curry, Marlatt, and Gordon (1987), pursuing Marlatt and Gordon's (1985) relapse prevention model, investigated the assumption that a smoker's cognitive-affective reaction to an early slip or lapse of control can escalate into a complete relapse if the individual focuses on internal, stable, and global causal elements (e.g., "It's my fault; my problem is going to arise in many future situations; and my problem isn't just confined to smoking"). This mindset is what Mahoney and Arnkoff (1979) called the "saint or sinner syndrome," but is now better known as the abstinence violation effect (AVE). Participants completed questionnaires prior to enrollment in a smoking cessation project and retrospectively after their first lapse or smoking episode. Interestingly, no evidence for an AVE emerged in the responses of the group prior to actual quit attempts; instead the would-be quitters employed "face-saving" attributions (external, unstable, and specific). However, after their initial failures, the AVE was in evidence and proved to be a significant predictor of return to regular smoking subsequent to an initial lapse. The question of whether the attributional pattern differs for relapers (those who return to smoking after their first slip) versus lapsers (those who return to abstinence) was addressed by O'Connell and Martin (1987). Their data tended to support the view that AVE is an effect rather than a cause of relapse (as relapers were more likely to make internal attributions as compared with lapsers). The data of Curry et al. (1987) lend further support to the view that preexisting attributional styles do not predispose smokers to failure in their quit attempts (however, see Harackiewicz, Sansone, Blair, Epstein, & Manderlink, 1987, for some intriguing suggestions about how attributional styles may interact with treatment modality to determine initial success and/or maintenance patterns).

If internal attributions for treatment failure are deleterious, so too are external attributions for treatment success—at least according to classical attribution theory (e.g., Davison & Valins, 1969). Yet, there are times (see Harackiewicz et al., 1987) when viewing one's successful self-generated efforts as being abetted by significant others leads to propitious long-range results. As self-management occurs in a social context (and is not seen as antithetical to external management), findings such as those reported by Morgan, Ashenberg, and Fisher (1988) help to contextualize a perspective that too often looks only "inside the heads" of would-be self-managers. These investigators found that at 2, 3, and 8-weeks posttherapy, abstainers could be distinguished from relapers by their reports of having received help from friends. And, in a study comparing unaided quitters, relapers, and current smokers, Karoly and McKeeman (1989) noted that quitters retrospectively reported not only more social support but less social hindrance than did relapers or current smokers. In addition, quitters experienced less internal (goal-related) conflict than the other two groups. The smoking literature is poised to catch up with the obesity literature in the sense that instigators of weight loss via operant and self-managed methods have, for some time, recruited the aid of significant others in their change programs (cf. Brownell, Heckerman, Westlake, Hayes, & Monti, 1978; Sacco & Israel, 1978; Zitter & Fremouw, 1978) with varying degrees of success.

In sum, then, the application of self-management to health-compromising habits like smoking, drinking, or overeating has been maturing since the early behavior modification days, with investigators learning from their failures (or short-term successes) and embracing their science at levels of complexity appropriate to the nature of the problem(s) at hand. This is, after all, the essence of parsimony, which means (contrary to popular misconception) being as complex as you need to be (not thinking as simply as you can).
THEORY AND PRACTICE: CLOSING THE GAPS

The "signs of theoretical and conceptual refinement" in self-management applications to health which Mahoney and Arnkoff (1979) envisioned a decade ago are today landmarks that are plainly visible and readily appraised. Cautious optimism is still warranted. However, with a sharpening of analytic focus, our appreciation of the fissures and fine points of clinical self-direction has likewise matured. Where we go in the next 10 years shall depend in large measure on how vigorously researchers, clinicians, and theoreticians from diverse backgrounds pursue the as yet unasked or unanswered questions, the available methodological options, and full spectrum of implementation.

Among the important gap-closing tasks that remain are the following.

1. The need to evaluate the individual and the combined treatment effectiveness of self-management strategies. A trend toward congregating modalities (self-management, social skills training, community support, etc.) into megaprograms may well benefit clients, if a powerful change-inducing and change-maintaining recipe is formed. Yet, eventually, cost-effectiveness concerns will dictate that the truly potent ingredients be sifted from the mix.

2. The need to approach the processes and contents of consciousness (and in a less self-conscious manner). Feed forward and feedback mechanisms, although vitally linked to environmental conditions and to recordable instrumental behaviors, are internal events, and not equivalent to the conditions that surround them. For example, being trained in the use of self-instructional techniques is not a sufficient condition for assuming that self-instructional techniques were learned or used (cf. Locke, 1972). Similarly, assessing the content of a reference value, memory, inference, or causal attribution is not equivalent to mapping the unfolding processes that activate, maintain, or transform these self-regulatory constituents (Robertson, 1986).

3. The need to examine the higher order control systems elements, especially the relatively stable as well as the continuously negotiated aspects of self-relevant cognition called identity. We must recall that, just as Wittgenstein saw the meaning of words in their use (not their object or referent), so too does control theory conceive of the meaning of self-regulatory strategies and tactics as their utility vis-à-vis the higher level reference values of the actor. In this regard, the clinician's view of the importance or usefulness of any self-management method is secondary to the patient's. The clinical assessor must therefore determine when it is necessary to teach new strategies or seek to influence the goals, values, or self-presentational motives that strategies exist to serve.

4. The need to formalize and systematize the clinical study of affective/arousal functions in self-management. Not only are different kinds of negative affective states generated by awareness of discrepancies between reference standards and input (e.g., Higgins, 1987) but so too does positive arousal result from meeting, exceeding, imagining, or anticipating a goal (Markus & Ruvolo, 1989). Just as depression or dejection can interrupt or distort problem-solving, positive mood can enhance it (Hoffman, 1986). Self-management training should therefore address not only the clinical target (compliance, pain, the urge to smoke cigarettes, etc.), but also the affect generated both by pursuing and avoiding the target. Affect management, for its part, should not be restricted to "getting rid of" unwanted emotions, because development of a positive affect is often required, and because even some discomforting emotions convey information relevant to adaptation (Ford, 1987).

5. The need to continue the study of self-managemental failure. An appreciation of the diversity of self-evaluational and postperformance judgmental processes, including rationalization, affectively induced cognitive errors, goal-resetting, and the like would, I believe, contribute to improving clinical effectiveness. So too would a focus on skills training to a meaningful set of criteria. This involves more than the patient's being able to repeat the rules or make the correct choice on a paper-and-pencil inventory. For a control system to work effectively, it needs to engage in error correction in a timely fashion and mobilize its energies efficiently. These qualities, which can be engineered into a machine system, are in humans the joint result of feedback-based practice, external support, and a firm belief in the worthiness of one's objectives (Wright & Brehm, 1989) and one's abilities (Bandura, 1986). Such qualities may not be readily purchased through 10 one-hour sessions of prepackaged therapy.

6. The need to approach the issue of human self-directedness from the macro level of social/political/economic reform. Considering the weight of
the social forces at work in the case of an inner-city youth on drugs, the upwardly mobile 25-year-old constantly on a diet, or the senior citizen trying to live with osteoarthritis, it would not be unreasonable to plan now to alter the cues and contingencies for future cohorts through societal restructuring, thus making the pursuit of an independent and healthful life-style more imaginable and thereby more feasible than it is today.

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