THE PROCESSES OF SELF MANAGEMENT IN COPING WITH STRESS

By

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INTRODUCTION

This research investigates the question of how people undertake health behavior change. It attempts to define what people experience and do during the process of changing health related aspects of their lives. The question of how people make health relevant changes in their habits and actions has become increasingly important as the responsibility for one's health has shifted from the medical care system to the individual (Engel, 1977; Mechanic, 1979; Winkler, 1979).

This paradigmatic shift is reflected not only in the increased emphasis on health in U.S. society, but also in the current health agenda of the United States. This agenda was set forth in Healthy People (USDHEW, 1979) and has been further detailed in Promoting Health and Preventing Disease: Objectives for the Nation (PHS, 1980) and Public Health Service Implementation Plans for Attaining the Objectives for the Nation (PHS, 1983). The focus is significantly different from earlier such statements. Of the fifteen high priority areas identified, only one, Health Protection, fits the traditional public health mode. Health protection has traditionally involved interventions that require little or no action on the part of the individual. These primarily passive health changes include interventions such as water fluoridation, immunization and toxic agent control. While these approaches remain important, fourteen of
the fifteen priority areas targeted for change are not amenable to such interventions. Rather, they require active change at the individual level of behavior. The targeted health concerns such as high blood pressure control, smoking control, alcohol and drug misuse prevention, physical fitness, exercise, control of stress, and reduction in violent behavior, fundamentally involve individual understanding, choice, commitment and personal change.

Future efforts to improve the health of society will require an empirically based model and an accurate methodology for assessing individual and group behavior change. The following study is an attempt to define the processes of change that are experienced when people undertake changes to improve their coping.

In order to provide a background for understanding the proposed passive observational study of self-change among individuals interested in stress management, several literatures will be reviewed. These include the current models of behavior change, at both the individual and aggregate levels. Results of the preliminary research conducted by Prochaska and DiClemente in the area of health-related behavior change are discussed as the basis from which the current research has developed. Several approaches to behavior change at the systems level are discussed from the perspective of social marketing and consumer behavior. The introduction concludes with an overview of stress and strain and a review of stress management interventions.
A model of self change

A review of the behavior change literature reaffirms the influence of medical models of care in determining our understanding of the behavior change process. The question of how people make change in their lives has primarily been considered from the perspective of how the clinician can help people make change. While the models that have developed from this perspective are useful, there are distinctions to be made between the self-directed and the clinician-directed change process. In fact, the processes experienced and behaviors enacted by healthy individuals attempting self change have been little discussed. Schachter (1982) investigated the effectiveness of self-managed attempts at health-related behavior change. He obtained retrospective interviews of two demographically distinct groups, staff and faculty in the Psychology Department at Columbia University and working, year-round residents of a small Long Island resort town. His data yielded surprisingly consistent results that provide a sharp contrast to similar measures from therapeutic endeavors. Of those who attempted to quit smoking, 61.5% of the town group and 65.8% of the University group had been successful in not smoking for a mean of 7.4 years. Of those who had been more than 10% overweight and had tried to reduce, 54.5% of the town and 72% of the University sample had been successful. The men had kept off an average of 26.8 pounds in the mean 9.7 years since inception of their weight loss attempts and the females an average of 24.8 pounds in 7.5 years.
This survey data is admittedly subject to the problems of retrospective bias. However, the cigarette smoking cessation data is supported by a 1979 Public Health Service study of a national sample of approximately 12,000 people (cited in Schachter, 1982). Of this group, 54% were present or former cigarette smokers. Some 74.8% of these had tried to quit and 50.4% had succeeded for an average of approximately seven years. While less dramatic than Schachter's data, this figure is substantially higher than those reported in the therapeutic literature.

Several reviews of outcome studies of health behavior change make the point. Wing and Jeffrey (1979) found the long term success of participants in behaviorally-based weight reduction programs to be somewhat dismal. At the time of followup, far less than 50% had maintained their weight loss. Leventhal & Cleary (1980) came to the same general conclusion with regard to behavioral smoking cessation programs which were almost uniformly effective in getting a high percentage of smokers to quit, but had high recidivism rates within several months. The research on commercial clinican-directed programs indicates that the initial abstinence rate of 70% drops to about 27% at the end of four years (Eraker, Becker, Strecher, & Kirscht, 1985). Stress management programs with healthy (often, worksite) populations have not fared any better. There is generally little positive change in levels of anxiety or symptoms or in the establishment of new behaviors such as relaxation practice (Ganster, Mayes, Sime & Tharp, 1982; Newman & Beehr, 1979; Riley, Frederiksen,
The question of how and why discrepancies exist between self change efforts and therapeutic endeavors is important. Schachter (1982) offers two hypotheses. First, he suggests that those who can change on their own do not come to professionals for assistance. Consequently, those who do attend programs or seek clinicians' assistance are the recalcitrant non-changers. While there is clearly some logic to this view, it does not explain the entire issue. Clinical experience suggests that at least half of participants in health behavior change programs have not made a serious attempt to change prior to the program.

Several more intriguing factors may also be involved. That is, the time dimension that is considered and the fact that evaluations of program outcome are limited to that of the single program. Time-limited and program-focused perspectives may deny the fundamental processes of change. Such analyses do not recognize processes as approximation to the goal, which may involve multiple attempts and incremental learning in order for sustained behavioral change to occur. Moreover, the impact of a single influence such as a behavior change program is difficult to assess in the light of the multiple influences contributing to the eventual achievement of the behavior change. Individuals who report successful self-change often relate that multiple attempts were made prior to the achievement of long-term success. This developmental learning process that is involved in making change is largely unrecognized in the clinical literature.
and is almost completely ignored by the prevalent methodology.

Support for this hypothesis may be found by contrasting reported outcomes of programs and the actual level of smoking cessation in the population. As discussed, the outcome for smoking cessation programs is around a 27% long-term cessation rate. Evaluation of self-help smoking cessation manuals under a variety of minimal-contact conditions has found long-term cessation rates of approximately 18%. These results contrast markedly with the Public Health Service data that indicate approximately 50% of smokers have been successful in quitting for an average of seven years (Schachter, 1982). The difficulty in integrating these data may be a result of the inaccurate methods being used to measure health-related behavior change. The current models and methodology do not appear to be consistent with the way in which people make and maintain change in their lives.

Models of change

Kurt Lewin's (1951) model of systems change forms the basis for virtually all the theory of human change. According to Lewin, change occurs only in systems (and people) that are experiencing significant disequilibrium. This is consistent with the basic concept of cybernetic theory and the models of self management which maintain that higher organisms are activated by a perceived deviation from self set reference levels (Kanfer & Karoly, 1982) The basic tenet is that systems (and people) strive for equilibrium and tend to resist change unless it restores equilibrium.
The resulting assumption, that people resist change until it is irresistible, is the rationale behind the emphasis in mental health centers on intervening immediately once a crisis has occurred. Klein and Lindemann (1961) discuss the impact of crisis experiences in terms of accentuating unacceptable situations for the individual. This awareness fosters needed change. Indeed, the dysphoria associated with an imbalance between expectations and reality is a prime factor in virtually all successful therapeutic change.

Clinical models of change

The psychotherapy literature is a prime source of theoretical models of clinical change. This brief review attempts to identify the consistent themes found in this literature.

Freud (Grienson, 1967) maintained that the fundamental process of change is to make the unconscious conscious. Therapy with the psychoanalytic model begins with the process of consciousness raising which is pursued through strategies of free association and dream analysis. It is assumed that clients are resistant to becoming aware of their inner conflicts and the meaning of their symptoms. The therapist's job, then, is to provide feedback that is effectively confrontational and clarifying. Once this has been accomplished the groundwork is laid for interpretation, the fundamental step in making the unconscious conscious. The therapist, relying on the patient's information, his/her own unconscious, empathy and intuition, and on psychoanalytic theory, assigns meaning and causality to the psychological phenomena. The validity of this interpretation is
gauged by the clients' responses. Primary among these are the resistances which must also be interpreted. As these blind resistances are overcome, the patient develops a neurotic transference relationship with the therapist in which she/he relives all the significant human relationships from childhood. The patient is then at the final stage of therapy, called 'working through.' This is a gradual, lengthy step during which the patient not only becomes aware of his/her defensive maneuvers and symptoms, but recognizes that there are new and more mature ways of controlling instincts that allow for some gratification without guilt or anxiety. Gradually the patient channels impulses through these new defenses and gives up immature defenses and symptoms.

Freud's view of behavior change is most noteworthy for the predominant focus on awareness and the almost parenthetical interest in the change of behavior. While it is not accurate that he believed insight was, in itself, enough, he places no emphasis on how people learn to do and maintain new behaviors. Instead, Freud implies that once the patient has overcome the resistances, and is ready to change behavior, the change will occur through whatever process best suits the patient.

The other major psychotherapeutic systems of thought, Gestalt, Adlerian, Rational-Emotive and Behavioral, share the perspective that all change requires increased self-awareness (Prochaska, 1979). Through feedback and education, the client gains awareness of the existence of the problem and the origins of the behavior (which is
variously construed depending on the theory of psychopathology). The individual then needs to find a way of being released from the problematic style of living. This next stage is called catharsis or corrective emotional experience in the verbal therapies, such as Gestalt and Adlerian therapy. The action or behavioral therapies, Rational-Emotive and Behavioral, do not address the need for emotional release of the symptomatology, tending instead to address the issue of the controlling contingencies, i.e., to determine (through functional analysis) what is currently controlling the behavior and what can be done to counter this influence through counter-conditioning and stimulus control (Prochaska, 1979). Virtually all the therapies emphasize the importance of the individual choosing what she/he wants in terms of lifestyle/behavior patterns.

In summary, the major systems of psychotherapy share the view that the process of change is initiated by consciousness raising. The verbal therapies attempt to provide the opportunity for catharsis or affective release and to enable the patient to choose more mature, fulfilling behaviors. The behavioral therapies focus on changing the way one responds to situations and attempt to make changes in the events or circumstances controlling the behavior.

The primary perspective in the psychotherapy literatures is that of the therapist, what he/she is to do and how the client will react. Nonetheless, they have provided a wealth of information about the processes that are sometimes involved in changing. The various
orientations pay differential attention to certain aspects of the process. The verbal therapies have paid surprisingly little attention to how people actually make and maintain behavior change. The behavior therapies have attended to this issue primarily, to the extent that they have negated the decisional and emotional aspects of changing. The behavioral self control and self management literatures provide theoretical and empirical information on behaviors involved in the change processes.

The three stage model

One of the most influential self-change paradigms is the three-stage model of Kanfer (1970) in which he has adapted the Skinnerian or operant paradigm to explain the process by which an individual attempts to change their own behavior. Kanfer's (1970) model includes a subjectively administered program which is built upon three processes of change: 1) self-observation, 2) self-evaluation (criterion or standard setting) and 3) self consequation (self-reward or self-punishment) (Kanfer & Karoly, 1982). This model generated much research into such relevant issues as the reactive and therapeutic effects of self observation (Kazdin, 1974), the factors accounting for the disengagement of performance standards, and the parameters of effective self reward and self punishment (Karoly & Kanfer, 1974).

By 1977 Kanfer had recognized the need for an increased reliance upon cognitive constructs to enhance the predictive accuracy of the model. For example, Cautela (1969), working within the behavioral
paradigm, placed primary emphasis on covert procedures in self control. His research addresses virtually every aspect of covert self control, from covert negative reinforcement (1970) to covert modeling (1976). The Self-Control Triad (SCT), a covert conditioning procedure designed to reduce the probability of occurrence of an undesirable behavior is the most recent contribution in this series. This three step procedure involves having the client say "stop" to himself or herself when performing the covert or overt undesirable behavior, take a deep breath, relax while exhaling and then imagine a pleasant scene.

Social learning theory and self control

A more broadly conceived model of the cognitive processes involved in self control is described by Mischel. Mischel (1973) recognizes that despite the fact that behavior is controlled to a considerable degree by externally administered consequences for actions, the individual also regulates his/her own behavior by self imposed goals (standards) and self produced consequences. Persons set performance goals for themselves and react with self criticism or satisfaction to their behavior depending on how well it matches their expectations and criteria.

According to Mischel (1973), the essence of self regulatory systems is the subjects' adoption of contingency rules that specify the kinds of behavior appropriate under particular conditions, the performance levels (standards, goals) which the behavior must achieve and the consequences (positive and negative) of attaining or failing
to achieve those standards.

This view is quite similar to that of Kanfer (1970). Mischel goes further, maintaining that once the standards are selected the route to goal achievement is mediated extensively by covert symbolic activities such as praise and self-instructions as the individual achieves sub-goals. Cautela's (1971) and Mischel's research support the assumption that imagined reinforcers and noxious stimuli influence behavior in much the same way as externally presented stimuli.

A number of Mischel's studies, many with children, have demonstrated that progress toward a goal is frequently mediated by self generated distractions and cognitive operations through which the person can transform the aversive self-control situation into one that can be effectively mastered (Mischel, Ebbesen & Zeiss, 1972; Mischel & Moore, 1973). Perhaps the most dramatic finding is that children, like adults, are able to resist freely available immediate gratifications, and follow experimenter and self-set rules that regulate conditions under which they may reinforce themselves. Mischel and his associates demonstrated that those cognitive transformations which assist the child in focusing on the informational, rather than the arousal aspects, of the tempting stimuli are most effective in enabling the child to delay gratification (Mischel & Boher, 1975). For example, children who reported focusing their attention on the number or placement of tempting stimuli, rather than on the smell or appeal were more likely
to be able to resist them.

Prior experience is an important determinant of one's self-management strategies. The stringency or severity of self-imposed criteria is a function of the standards that have been observed in salient models. These standards may be retained with considerable persistence (Mischel, 1973).

The organization of the various techniques identified through research into a strategy that can be justifiably termed self-management requires a general scheme of rules for how priorities are to be set and sequences are to be organized, as well as rules for when particular behaviors are to be terminated. On some level, all people have such plans or schemes for directing their behavior.

The research on the role of plans in goal attainment has basically been limited to lab experiments with children. This line of research, conducted primarily by Patterson and Mischel (1975), has demonstrated that self-instructional plans can be used to facilitate performance in the presence of a potential distractor. Plans that are elaborated and reward oriented are more effective than those that simply specify how to continue working on the repetitive task (Patterson & Mischel, 1975).

While there are other fields of inquiry that speak to the issue of plan formulation in the change process, e.g. cognitive schemes (Kelley, 1972) and children's self regulation characteristics (Harter, 1982), the most directly relevant theoretical work comes out of control or cybernetic theory.
Control/cybernetic theory in self-management

Cybernetics was defined by Weiner in 1948 (cited in Carver & Scheier, 1982a) as the science of communication and control. Its principles are the self regulatory principles of homeostasis-seeking organisms. The basic unit of cybernetic control is the negative feedback loop. This is a discrepancy reducing loop, its overall function is to reduce or eliminate any perceptible discrepancy between a perceived (feedback) value and some standard of comparison.

The basic functions of the feedback loop involve the input function (perception), the comparator, the output function (operate) and overt or covert behavior. It is essential to recognize that the comparison process has only one of two possible outcomes, either there is a discrepancy from the reference standard or there is not. If there is either a positive or negative discrepancy, the output function is authorized to change present behavior.

Naturally, human behavior is not adequately conceptualized by a single feedback loop. There is a multitude of these mini-systems linked together to form larger structures. The arrangement of these feedback loops allows both branching and hierarchical organization.

The concept of a hierarchy of feedback loops provides a model of planned self-management by enabling the development of a blueprint of individual behavior. In a hierarchical arrangement, some loops are subordinate to others, those that are superordinate.

There are several important tenets regarding the reference
standard. First, the standard used in the comparison process is external to the feedback loop. Additionally, the standard that exists at a given level of analysis can be set and reset continuously. Powers (1973) has presented a model for the hierarchy of control in behavioral self regulation, in which each successive superordinate level of feedback systems "behaves" by specifying reference values for the next lower level of control.

Carver and Scheier (1982a; 1982b) have defined five levels in the hierarchy basic to personal self-management. They are:

- **System Concepts** - Superordinate - The overriding reference value (e.g., self-image)
- **Principle control** - Beliefs that support the System Concepts
- **Program control** - If-then decisions on activities that support one's Principles
- **Sequence control** - Overt behavior chains that carry out the decisions made at the level of Program control.

Carver and Scheier make the assumption that most social behavior occurs at the Program and Principle levels. They further maintain that when the categorizational structure is accessed in the natural process of recognizing perceptual input, behavioral information is simultaneously accessed. That is, in the same way that the perception of a very limited number of stimuli activates schemata of person and setting information allowing the stimuli to be catagorized, so too perceptions that stimulate reference of one of the control structures, related catagories of behavior are also
accessed (Carver & Scheier, 1982a). For example, if a person references a Principle standard (a belief) that mistakes demonstrate his/her inadequacy, the associated Program and Sequence standards would be activated, resulting in decisions and behaviors, respectively, that are associated with failure, such as giving up.

The cybernetic model provides a broad and well defined theory of normal human behavior. Although it has yet to be thoroughly tested as a model of human self directed behavior change, it provides very specific assumptions and clear expectations. In general, the predictions of the cybernetic model are the same as those of the behavioral and social learning theories of Cautela, Kanfer and Mischel. The fundamental distinction is that while these theories are implicitly or explicitly based on Hull's (1952, cited in Carver & Scheier, 1982a) drive reduction theory of motivation, cybernetic theory posits no similar motivation.

What cybernetic theory does provide is a hierarchical model of goal determination and behavioral integration. The implications for self-directed change are several. Specifically, the determination of the whether change is appropriate occurs at an upper level of the hierarchy, the system or principle levels. The decision is made on the basis of feedback from the lower levels as well as from information processed directly at an upper level. Once a superordinate decision is made, some behaviors result in discrepancies during the comparison process because the old behaviors are inconsistent with the new concept existing at the upper level of
the hierarchy. The discrepancy requires change at the program (decisional) and sequence (behavioral) levels. Trials of new behaviors will occur as the individual attempts to determine the most effective ones for reducing the discrepancy (implementing the change). The success of the change attempts in reducing the discrepancy is a function of several factors, including the information that is fed back to the upper levels, the skill of the person in executing the newly required behaviors, the environmental support for the maintenance of new behaviors, etc. The standard that is set may be associated with such pragmatic issues as the response costs, the benefits, and required degree of consistency of the new behavior with other important behaviors.

The strength of cybernetic theory is that it provides a framework for understanding and predicting both consistent and changing functioning. However, it lacks specification of the processes of change that are experienced by the individual. This deficiency is partially filled by the early work of Prochaska and DiClemente. These researchers have investigated the questions of the temporal sequence, or stages, of change and the processes involved at each stage.

The stages and processes of self change

The preliminary work in this development was conducted by Prochaska (1979) in review of the 18 major systems of psychotherapy. He attempted to identify the common elements among these theories. These common elements he defined as the trans-theoretical processes
of change, those processes that were common across the theories. These he labelled: Consciousness Raising (increasing perception and awareness); Catharsis (relief from habitual expectations/ways of thinking); Changes in Conditional Stimuli (intervening in controlling situations through such techniques as counter-conditioning and stimulus control) and Contingency Control (changing the reinforcers available for the target behaviors).

From this transtheoretical model of therapeutic change, Prochaska and his colleagues have attempted to develop empirically defined scales that reflect the stages and activities involved in making change. They used a traditional approach to the development of a reliable scale that reflects the change processes used by people involved in self-directed personal change. The Processes of Change Questionnaire was developed by subjecting a long list of rationally based questions that described different things people might think and do when they were in the process of change. For example, items included: "I look for information related to smoking; I tell myself that I am able to quit smoking if I want to". The large scale was subjected to Principal Components Analysis to obtain a highly reliable measure with a reduced number of items. A final 40 item measure included four items for each of the processes of change. Subjects rated on a 5-point Likert scale how frequently they employed each item in the past month (1 = not at all, 5 = repeatedly).

The areas of change they have investigated include the following: Psychotherapy (DiClemente & Prochaska, 1982; McConnaughy,

This wealth of empirical research has contributed to several important modifications of the original assumptions. The temporal dimension of change was originally categorized into five stages: 1) Precontemplation, 2) Contemplation, 3) Decision Making, 4) Action, 5) Maintenance. Within these stages a number of things people think and do in order to change, were identified as the processes involved in changing.

The processes do not necessarily reflect a temporal dimension, but are organized in terms of the focus of the change effort. That is, the processes focus on the individual's cognitions and affect, the individual's behavior, the environment, and the interpersonal domain. The processes, originally theoretically defined, have now been empirically validated through factor analytic research on the Processes of Change Questionnaire (Prochaska & DiClemente, 1983; in press). The processes are labelled consciousness raising, self-re-evaluation, self-liberation, dramatic relief, (individual cognitions and affect); counter-conditioning, stimulus control, and reinforcement management (individual behavior); social liberation, and environmental re-evaluation (environmental considerations); and
helping relationships (interpersonal support) (DiClemente & Prochaska, 1982).

Much of the work of Prochaska and DiClemente has focused on smoking cessation, an objectively quantifiable area of behavior. In an extended study, Prochaska & DiClemente (1983) logically categorized 872 past and present smokers from Rhode Island and Houston into five stages of change based on their current and recent smoking status. These categories were the long-term quitters (LTQs), people who had not been smoking for 6 months; the Recent quitters (RQs), people who had quit on their own within six months of entering the study; the Contemplators (Cs) these were smokers who were thinking seriously of quitting in the next year; the Immotives (Is) these smokers had no intention of quitting; and the Relapsers (RLs) these people had been unsuccessful at their attempts to quit over the past year. These groups correspond with the stages of change: LTQs being in the Maintenance stage; RQs being in the Action stage; Cs being in the Contemplation stage; and Is being in the Precontemplation stage. Basic demographic data on these 872 subjects indicated that these were generally middle class, middle age adults who had started smoking as teenagers.

The subjects completed the Processes of Change Questionnaire (POCQ) once every six months for two years, rating the frequency with which they had engaged in each activity over the previous month on a scale of one to five (1 = not at all, 5 = repeatedly).

The initial results of the study indicated that the change
processes were used differentially by people in the various stages/groups. A MANOVA between the five groups indicated significant differences in the mean scores of each group on the various processes \((p<.001)\). Ten separate ANOVA's demonstrated significant differences in the mean scores between groups on each process. Newman-Keuls comparisons were run to determine how groups differed on the frequency with which they used each of the change processes. Table 1 shows the which processes were used most frequently in each stage.

It is possible to understand the experience and action of individuals in each group on the basis of the processes they are using. The group in the Precontemplation stage had significantly lower scores on eight of the ten processes of change, indicating that they are not actively engaged in the change process. Only on the scales of Self-liberation and Helping Relationships are they similar to those in other stages. The Helping Relationships scale indicates that they experience support from others. The support may be interpreted as support for smoking (or in spite of smoking) rather than support to quit. DiClemente & Prochaska (1983) suggest the Precontemplators' relatively high self liberation level indicates their belief that they can stop any time they want to, but they just don't want to. However, they (DiClemente & Prochaska, 1983) report other data that seem to suggest caution in accepting this interpretation. Specifically, these subjects have high temptation levels and the lowest self efficacy regarding quitting. It is
Table 1

Processes of Change Listed Under the Stages in Which They Are Emphasized Most

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<td></td>
<td>Consciousness raising</td>
<td>Self-reevaluation</td>
<td>Counter-conditioning</td>
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<td>Self-reevaluation</td>
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<td>Helping relationship</td>
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<td>Management</td>
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<td></td>
<td></td>
<td>Stimulus control</td>
<td></td>
</tr>
</tbody>
</table>

*aEight Processes were used the least in the Precontemplation stage (from Prochaska & DiClemente, 1983)*
interesting to note that those in the Precontemplation stage (the Immotives) rate the pros of smoking as high as their smoking counterparts (Contemplators and Relapsers), but their rating of the cons of smoking is the lowest of any group.

Interestingly, those individuals who had the highest ratings of the negative aspects of smoking (the "cons") were those in the Action stage, suggesting that the active experience of the negative effects of smoking help individuals reset their personal reference standards and that this occurs when they are ready to change. This is consistent with cybernetic theory (Carver & Scheier, 1982b) and Lewin's basic model of change (1951). From Prochaska and DiClemente's work it is not possible to say if the change in the evaluative balance of pros and cons of smoking preceded, followed, or occurred simultaneously with the move to the Action phase.

The question of what stimulates the move from Contemplation to Action is a pivotal one. As mentioned previously, a Decision making stage was originally posited to exist between these stages. However, the items that loaded on the Decision making factor in factor analytic studies completely overlapped with the Action and Contemplation stages (McConnaughy, Prochaska & Velicker, 1983).

Consequently, decision making as a separate factor was dropped from the model. However, in a recent communication (December 5, 1984) Dr. Prochaska acknowledged that at least two of their findings suggest the existence of a definite decision making stage. Specifically, they had defined, through cluster analysis, a group of
subjects who were in the decision making stage with regard to therapy (McConnaughy, Prochaska & Velicher, 1983) and had recently found a decision making stage among adolescents developing the smoking habit. Decisions and commitments have regularly been included in discussions of change (Janis & Mann, 1977). Decision making involves a resetting of one's reference standard at an upper level of the hierarchy of personal control (Carver & Scheier, 1982a).

Patterns of behavior change

The patterns of change that occur in self directed health improvement have been addressed by the first follow-up of the smoking cessation study (DiClemente & Prochaska, in press) and in a study of changes in smoking, weight loss and psychic distress in the same population (Prochaska & DiClemente, in press). In the smoking cessation aspect of the study (DiClemente & Prochaska, in press), the utility of the ten process of change variables, self efficacy, temptation level and pros and cons of smoking were assessed in terms of their ability to predict which subjects would progress, regress or stay in the same stage over the four to six months until the first follow-up.

Discriminant function analysis was performed on four of the initial five groups to predict changes in group membership. No analysis was performed on LTQ's since few of them had made change in their smoking status.

Discriminant function analysis of Contemplators who had changed to become either recent quitters (N=12) or Immotives (N=18) distin-
guished four variables that significantly discriminated these groups. The variables and the standardized discriminant function coefficients were: cons of smoking (.84); self-reevaluation (.42); consciousness raising (-.48) and temptation (-.45). Contemplators who became Recent Quitters tended to have higher cons and self-reevaluation scores and lower temptation level and consciousness raising.

Recent Quitters who became either Long Term Quitters or Relapsers were distinguished on the basis of self-reevaluation (-.80); self efficacy (.63) and helping relationships (.45). Classification accuracy based on this function was 51% across all groups. Apparently too much self-reevaluation with low support for quitting is predictive of relapse.

Relapsers who became Immotives were distinguished from those who stayed in the Relapse stage on the basis of higher social liberation, dramatic relief and stimulus control scores and lower helping relationship, self-liberation, counterconditioning and self-reevaluation scores. This function accounted for 60% of the variance of Relapsers.

Immotives who changed in any way tended to have high self-reevaluation and cons scores, and low social liberation and pros scores. Classification accuracy was 74% on predicted group memberships (DiClemente & Prochaska, in press).

In summary, it is important to note that 13 of the 14 predictor variables contributed to at least one function, with only
environmental re-evaluation failing to be retained. Secondly, these processes had both positive and negative loadings indicating that movement in the change process is not simply a matter of doing something rather than doing nothing. Self-re-evaluation is perhaps the best example of this. For smokers, greater self-re-evaluation tends to predict progress, but the same general level of self-re-evaluation in recent quitters is predictive of relapse (DiClemente & Prochaska, in press).

Certain processes, particularly the environmental variables, tended to predict little positive change. For example, frequent use of dramatic relief and social liberation tended to predict Contemplators remaining Contemplators, Precontemplators (Immotives) remaining Precontemplators and Relapsers becoming Precontemplators. This suggests that high use of processes that focus one's attention externally reduce the inner directedness necessary for change.

In a similar study, Prochaska and DiClemente (in press) expanded the behaviors of interest to include weight reduction and psychic distress as well as smoking. Over a period of two years, they evaluated the processes of change in a sample of 605 subjects regarding smoking cessation, weight reduction and gaining relief from psychic distress. In this study, the Smoking version of the POCQ was administered to the 605 subjects who were currently or had been smokers. Six months later the Weight POCQ was administered to the 420 of the 605 subjects who currently or had in the past been at least 10% over their ideal weight. Six months following the weight
loss assessment, the Psychological Distress POCQ was completed by the 320 subjects who currently or in the past had experienced at least one episode of psychic distress.

For each of these behaviors, subjects were given an expanded version of the POCQ that included questions pertaining to Substance Use and Interpersonal Systems Control. This questionnaire has 50 questions. The Substance Use scale does not distinguish between professionally prescribed medications and self-medication. Interpersonal Systems Control involves either avoiding people who contribute to a problem or seeking out people who decrease the problem.

Separate forms of the POCQ were created for smoking, weight control and psychological distress. Each of the three had items that were worded consistently across problem areas. The same 5 point Likert scale was used to rate frequency of use. Six of the change processes (Consciousness Raising, Self-Liberation, Reinforcement Management, Helping Relationship, Dramatic Relief and Stimulus Control) are measured by the same items with only the name of the problem (smoking, weight or distress) being different. For the other five processes, the items had to be different, but are parallel in intent.

Psychic distress was characterized as "the fever of mental health" (p. 3 of the pre-publication manuscript, Prochaska & DiClemente, in press), a prevalent, highly recognizable and debilitating clinical syndrome consisting of anxiety, depression,
cognitive impairment and hopelessness. The President's Commission on Mental Health (1978) estimated that at any given time as much as 25% of the adult population suffers intensely from this syndrome. Further, the majority of these persons do not seek professional help, but attempt to cope on their own or with the help of significant people in their family or community (Cowen, 1982; Mellinger, Balter, Mankeimer, Cisin & Parry, 1978).

Principal Components Analysis (PCA) was performed on the data set for each problem area to determine the component structure within each problem area and to assess consistency in structure across problem areas. These PCA's yielded eleven components that emerged as separate processes. Only environmental re-evaluation did not emerge as a distinct component. Of the 50 items on each of the scales, 49 of them loaded .40 or better on a single component. Coefficient alphas ranged from .67 to .96 (Prochaska & DiClemente, in press).

In summary, within each of these problems areas a stable component structure emerged. Eleven of the twelve theoretical processes of change were found to replicate across problems of smoking, weight control and psychological distress.

The design of this study enables comparison of change processes across areas both between and within subjects to answer such questions as: "What are the similarities in frequency of use of processes across problem areas?" and, "Are particular processes more relevant to specific problem areas?"

To address these issues statistical comparisons were made only
between those six change processes that were worded consistently across the problem areas. Thus some of the processes, social-liberation, self re-evaluation, counter-conditioning, substance use and interpersonal systems control, are not included in the statistical analysis. Unfortunately, not all of the data on the psychological distress questionnaire was usable, allowing across area comparisons in the Action stage only.

The mean level of endorsement of each process is given in Table 2 (scale is 1 = never, 5 = repeatedly) for subjects in the Action stage of smoking cessation, weight reduction and psychic distress. Comparisons of the processes used in the Action stage indicated small but several statistically significant differences across behaviors in the levels of use of the six similarly worded processes. There are greater differences across behaviors in use of the five processes that have differently worded items. However, the non-comparable wording does not allow conclusions to be drawn based on these differences. (See Table 2).

Within stage comparisons

Within subjects comparisons of individuals in the Contemplation stage of both smoking cessation and weight reduction (N=15) indicated that Consciousness Raising was used significantly more (p<.001) in weight change than in smoking, x = 3.1 and 2.4, respectively. Stimulus Control was used significantly more often (p<.01) in weight change than smoking, x = 1.9 and 1.3, respectively. Self-liberation, a process of asserting one's ability to change, was used Table 2
<table>
<thead>
<tr>
<th>Process</th>
<th>Smoking (N=24)</th>
<th>Weight (N=195)</th>
<th>Distress (N=129)</th>
<th>Significant Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD Rank</td>
<td>M</td>
<td>SD Rank</td>
</tr>
<tr>
<td>Consciousness Raising</td>
<td>2.2</td>
<td>1.0</td>
<td>3</td>
<td>1.0</td>
</tr>
<tr>
<td>Self Liberation</td>
<td>3.3</td>
<td>1.2</td>
<td>5</td>
<td>1.0</td>
</tr>
<tr>
<td>Reinforcement Management</td>
<td>3.5</td>
<td>1.3</td>
<td>5</td>
<td>1.0</td>
</tr>
<tr>
<td>Helping Relationship</td>
<td>2.2</td>
<td>0.9</td>
<td>4</td>
<td>1.0</td>
</tr>
<tr>
<td>Dramatic Relief</td>
<td>1.8</td>
<td>1.0</td>
<td>6</td>
<td>2.0</td>
</tr>
<tr>
<td>Stimulus Control</td>
<td>2.8</td>
<td>1.0</td>
<td>1</td>
<td>3.8</td>
</tr>
<tr>
<td>Social Liberation</td>
<td>1.4</td>
<td>0.7</td>
<td>5</td>
<td>1.5</td>
</tr>
<tr>
<td>Environmental Reevaluation</td>
<td>2.7</td>
<td>1.0</td>
<td>2</td>
<td>2.9</td>
</tr>
<tr>
<td>Substance Use</td>
<td>1.8</td>
<td>0.9</td>
<td>4</td>
<td>2.2</td>
</tr>
<tr>
<td>Counterconditioning</td>
<td>1.8</td>
<td>0.9</td>
<td>4</td>
<td>2.2</td>
</tr>
<tr>
<td>Interpersonal Systems</td>
<td>1.8</td>
<td>0.9</td>
<td>4</td>
<td>2.2</td>
</tr>
</tbody>
</table>

Note: The 5-point Likert scale assessed frequency of use (from 1 = Never to 5 = Repeately).

* p<.05; ** p<.01; *** p<.001.
significantly more often in weight than smoking, p<.05, x =3.4 and 2.9 respectively. The same pattern of differences were seen in those individuals who were in the Maintenance stage of smoking cessation and weight reduction (N=21), with weight maintenance requiring more Consciousness Raising (p<.001), Self-Liberation (p<.01) and Stimulus Control (p<.01).

In the Action stage, the same three processes distinguish change efforts in the same individuals (N=18) in attempting to manage weight and distress, with weight again being the more active problem area.

Although interpretations from this data must be made cautiously, there are some interesting trends. It appears that weight control requires more active cognitive, affective and behavior change than smoking cessation, at all stages. The necessity of eating and the ubiquity of weight-relevant stimuli apparently make this a particularly challenging change area. Helping Relationships was the most frequently used process across virtually all behaviors and stages. This speaks to the importance of the work of Janis (1983) and Caplan (1984) in defining ways for providers to develop and utilize their "referent power". Reinforcement Management and Dramatic Relief, though used less frequently, come out important to all three areas of change.

The problem of psychological distress is characterized by an interesting difference from the other two areas of behavioral change in the Action stage (Table 2). The mean level of use of Interpersonal Systems Control x = 3.5 is dramatically higher than
that in the Smoking and Weight areas, $x = 1.8$ and 2.2, respectively. The variance of each is essentially the same. Apparently, avoiding distressing situations and people, and seeking positive experiences are fundamental strategies used in managing distress. Unfortunately, interpretation is limited by the fact that these data are not related to success or failure of the change effort.

Despite the ground breaking character of their work, it is imperative to acknowledge the limitations to the work Prochaska, DiClemente and their colleagues have completed to date, many of which can be related to the early stage of this line of research. The indefinite status of a decision making stage is a case in point. The current version of the model does not include this as a stage, but is unable to explain the processes of decision and commitment. This is an outcome of trying to represent real phenomena on the basis of rational definitions and empirical, factor analytic studies.

The confusion regarding decision making points out the fundamental shortcoming of the work as it currently stands. While there is a good empirical basis for understanding change, the theoretical structure has yet to be developed. This may simply be associated with the stage of development of the work.

There is another related heuristic limitation. That is, the model continues the tradition of what Karoly describes as the "apparent linearity of the process" (p. 25) of change. Prochaska and DiClemente are careful to disavow the sequential or linear nature of
the model but they have not provided a mechanism or explanation for movement from one stage to another. They appear to assume a forward movement unless relapse occurs. A theoretical basis for explaining how movement occurs is necessary. In the current research, the cybernetic model is presented as a useful theoretical formula into which Prochaska and DiClemente's empirically derived model of change can be integrated. The key contributions of this theory are the concepts of hierarchy of control, the constancy of feedback and the continuous resetting of reference standards. Incorporating these notions into the model of change requires more attention to the impact of the processes on the decision making or resetting of self determined standards. It seems to require the notion of overt and covert trials of the new or desired behaviors.

Expansion of the model to incorporate these notions may offer a means to address what appears to be a poorly defined stage, Action. This stage currently incorporates all but two of the processes of change, providing little discriminating information about what goes on in the action phase of change.

A final concern is being addressed in the study Dr. Prochaska and his colleagues currently have underway, that is, the six month intervals between measures. It is possible that this time interval may be so long as to prevent an understanding of the progression and development of the change process.

The foregoing discussion provides a basis of research and theory in self directed behavior change. The present research attempts to
relate these intraindividual processes to behaviors in the world that are relevant for the health promoter interested in attracting and communicating with individuals at all stages of change. The following discussion addresses the issues and approaches to the large scale communication and persuasion efforts.

Communication in the Change Process

Information is an integral part of the individual change process. Communication is fundamental to increasing individual awareness, improving understanding of problems, providing a range of alternatives, describing and demonstrating new skills and evaluating the success of solutions.

A primary concern of behavior change agents involves the issue of how to increase individual awareness of the advantages of and opportunities for making change. That is, how to create a need, how to instigate behavior change in others.

The response to such questions depends on the perspective that is taken. The current range of perspectives includes that of information diffusion, social marketing and behavior modification. The information diffusion literature differs from that of social marketing and individual behavior change in several significant ways. Many of the differences are a reflection of one's level of analysis, however there are important distinctions in the approaches as well.

Information Diffusion
The diffusion literature addresses behavior change, or adoption of innovations, from a sociological, aggregate perspective. Adoption of an innovation is the process by which an individual becomes committed to the continued use of an idea, practice or object that the person perceives as new or different. From this perspective, innovations are diffused or spread through the population, much like a contagious disease (Zaltman and Wallendorf, 1983). While this model of the diffusion process has been important in developing our knowledge of the social change process, the perspective has limitations for activating individual health behavior change. There are several reasons for this. Basically, diffusion models a top down process. A source oriented model, it focuses primarily on the perspective of the agency or change agent. The innovation is defined and initiated at the top and trickles down to the receiver. The typical method employed to influence the receiver to make change is the dissemination of persuasive information. If there happens to be a match between the recipient's information needs and readiness to change, and the message that is received, the objective may be accomplished (Donohew & Springer, 1980). However, because the initiator interprets the nature, advantages and benefits of the innovation there can easily be a mismatch between the message and the relevant information needs of the receiver. In this instance, the adoption or change process never gets started. The diffusion model has predominated in large scale public health programs that require behavior change. The majority of diffusion research has focused on
tracking the spread of the innovation throughout the social system.

It is relevant to note the parallels between this model and the traditional "waiting mode" of health care delivery (Rappaport, 1977). The waiting mode is characterized by the expert who waits in the professional health care setting to be approached by those in need of health interventions. This, too, is a source oriented, relatively passive, provider-focused model. This orientation often precludes an accurate understanding of the needs of the recipient in his/her natural setting.

The provider-focused models are not, of course, invalid. Nor must they necessarily preclude an understanding of consumer needs. The level of analysis is that of the individual, but the orientation is generally that of the institution, its needs and constraints. Resources and information do indeed flow from this source. However, the model is limited by its focus on individual change that occurs relatively passively at the instigation of an outside agent. The model has been accurately described as a sociological description of the change process.

A contrasting model in the diffusion literature makes the recipient-client the primary focus. Donohew and Springer (1980) have termed this the information seeking approach to communication. In this proactive model the individual is treated as an initiator of information searches. The emphasis is on information exchange rather than persuasion, a process in which the change agent is a catalyst rather than an expert or persuader. The change agent encourages the
individual or community to define their needs because they are the best source of that information. The change agent provides help in identifying, developing, and disseminating the needed information.

Parallels also exist between this approach to communication by change agents and the "seeking mode" of human service delivery (Rappaport, 1977). The seeking-mode is a non-traditional approach which involves the health service provider as a participant-observer in the community in which he/she intends to provide services. Potential clients are the primary source of information used in designing and developing necessary and desired services. There is an active attempt to "fit" the services, both their content and the delivery mode, to the community's expressed needs.

The basically descriptive diffusion literature provides a nomothetic model of change that assumes diffusion follows a normal distribution over time. Adopters are characterized by the time at which the innovation is adopted. A few are very early or very late, with the majority being in the middle. (Figure 1).

Important as this model has been for its early contribution in describing the adoption process in a social system, it says little about the development of the individual's (or even group) commitment to adopt the innovation. The process, per se, has not been well explicated in the diffusion literature. However, the merging of this literature with that of marketing has been fruitful. Zaltman and Wallendorf (1983) have integrated models of adoption from the marketing and diffusion literatures to provide a more fully developed
The innovativeness dimension, as measured by the time at which an individual adopts an innovation or innovations, is continuous. However, this variable may be partitioned into five adopter categories by laying off standard deviations from the average time of adoption.

Rogers & Shoemaker, 1971

Figure 1

Adopter Categorization on the Basis of Innovativeness
theoretical model of adoption of new behavior or products.

Theoretical Model of Adoption

The model of individual adoption processes proposed by Zaltman and Wallendorf (1983) recognizes that there are a number of stages one goes through prior to making an important behavior change. They propose a dynamic model in which feedback occurs throughout the process (Figure 2). The authors (Zaltman & Wallendorf, 1983) maintain that the decision making aspects of the process are somewhat different for adoption of known products or behaviors than for innovations. However, they suggest that the model applies to behavior change in general.

The authors caution that the stages may not be as distinct as represented and that people may not always progress sequentially through them. It appears to be most valid under conditions of moderate to high involvement by the consumer. Low involvement purchases are likely not to receive the same level of effort and consideration.

The process of adoption, according to Zaltman and Wallendorf (1983), begins with perception. Both the innovation and the need for the innovation must be perceived by the individual. Perceptions change throughout the process, but continue to exert a powerful influence on decision.

Motivation is necessary to overcome the natural resistance to change. Consumer perceptions of their need and the new product's ability to satisfy it must be strong and positive to provide the
Perception → Motivation → Attitude → Legitimation → Trial → Evaluation → Resolution → Adoption

Zaltman & Wallendorf, (1983)

Figure 2. Theoretical Model of Adoption
necessary impetus for change.

The consumer's attitudes develop, both affectively and cognitively, with information received from others and through mass media channels. Key aspects of consumer attitudes include the perceived ease of adoption and ability to use the innovation successfully.

In the legitimation stage, according to Zaltman and Wallendorf, consumers seek reinforcement for the purchase or change they are contemplating. Potential changers look to others to determine the appropriateness of what they are considering. The trial stage involves putting the innovation or change to a personal test. When the nature of the change prohibits trying it out, the potential consumer might "try" the new product or change by psychologically sharing in the use of the product with another person who is actually using the product. Some individuals may initiate this step by observing others who are using the product or doing the behavior.

Evaluation in this model (Zaltman & Wallendorf, 1983) occurs between the trial and adoption stages. It is thought to be necessary prior to making a commitment to adopt or change. At this stage it appears to be important to help consumers evaluate specific aspects of their trial. Even when the trial is successful, if the consumer does not feel secure in their ability to accurately evaluate some aspects of the product, adoption may not occur.

The adoption stage represents the final movement toward commitment to repeated or continued use. This stage has cognitive,
affective and behavioral components that are based on the experiences during the trial stage. Alternatively, rejection may occur at this point as a result of unsatisfactory outcomes in the process prior to this stage.

The final stage in Zaltman & Wallendorf's model is resolution. This concept includes cognitive dissonance reduction but is more broadly conceived to include all other adjustments made as a result of the decision to adopt (or reject) an innovation.

This model, though only generally defined, helps the behavior change agent identify the aspects of the change process that must be addressed. It does not specify how people move to adoption, except in the most general way (through improvement in motivation and attitudes and after positive trials). However, the concepts of legitimatization, trial and evaluation seem to be important action concepts that are missing from Prochaska and DiClemente's (1983) model.

Hierarchy of Effects Framework

The Stanford Heart Disease Prevention Program (SHDPP) has employed a simple model to represent health behavior change (Solomon, 1984). This framework, called the hierarchy of effects framework (HEF), was adapted for use in the Five City Project from Rogers and Shoemaker's (1971) model and that of several other authors. The steps include awareness, knowledge, motivation, skills learning, and maintenance and self management. This hierarchy of effects assumes that individuals proceed through various steps during the process of
change. It is not assumed that the same sequence is always followed. However, the model does help direct the efforts of change agents. Table 3 demonstrates the results of formative research for the Five City Project (Solomon, 1984). With regard to the cardiovascular risk factor of stress, the formative research revealed that there was generally much awareness and good motivation to manage stress. However, there were knowledge, skills and self-management deficits regarding stress in the majority of the population.

The formative research suggested that what was needed was knowledge and skills for managing stress. The question of how to do this in a manner that stimulates individuals to initiate action is a classic one. It reflects the "KAP gap" recognized in marketing and family planning and interventions. This is the gap between knowledge, attitudes and practices. Success in changing practices or behavior depends in part, on specifying intermediate goals and actions (Kar, 1978). Understanding the qualities or attributes of the product (stress management in this example) is an important step in determining how and what to communicate in order to identify specific goals and actions.

Attributes of the Innovation

Understanding of the innovation must be systematic. Innovations can be characterized in terms of their attributes. This has been done to help predict initiation and maintenance of health action (Becker, Maiman, Kirsch, Haefner, Drachman & Taylor, 1979). The attributes of the proposed health action, e.g., dieting, are Table 3
Table 3
Outcome of Formative Research on Stress

<table>
<thead>
<tr>
<th>Stages in Behavior Change Process (HEF)</th>
<th>Stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness</td>
<td>+</td>
</tr>
<tr>
<td>Knowledge</td>
<td>-</td>
</tr>
<tr>
<td>Motivation</td>
<td>+</td>
</tr>
<tr>
<td>Skills Learning</td>
<td>-</td>
</tr>
<tr>
<td>Maintenance &amp; Self Management</td>
<td>-</td>
</tr>
</tbody>
</table>

Five City Project, SHPP
Solomon, 1984
considered in terms of their perceived benefits and costs or barriers. It is a basic tenet that minimizing costs while maximizing the salience of benefits is pivotal to improving compliance.

Ostlund (cited in Zaltman & Wallendorf, 1983) has specified a number of important attributes of innovations:

1. **Relative advantages**: what the new product does that alternatives do not do or do not do as well.

2. **Complexity**: (a) how difficult it is to use the new product and (b) how difficult it is to understand how the product works.

3. **Compatibility**: (a) how well the new product fits in with the customer's thinking; (b) how well the new product fits in with the customer's social situation; and (c) how well the new product fits in with other related or connected products.

4. **Trialability**: how easily the new product may be tried without full commitment.

5. **Divisibility**: how easily the new product can be tried in a mini form.

6. **Reversibility**: how easily the new product can be discontinued without adverse effect.

7. **Communicability**: how easy it is to receive and send information about the new product.

8. **Adaptability**: how easy it is to modify the new product to the unique circumstances of the user.

9. **Cost**: the magnitude of the financial and nonfinancial resources required.

10. **Realization**: how soon the benefits of having a new product are experienced.

11. **Risk**: the magnitude of the dysfunctional consequences of the new product and the likelihood of their being experienced.

The greater the relative advantage, compatibility, trialability, divisibility, reversibility, communicability and adaptability, the sooner realization of benefit; and the lower the complexity, the cost
and risk associated with an innovation the more likely a consumer is to adopt the innovation (Zaltman & Wallendorf, 1983). Similar attributes characterize the likelihood of an individual maintaining a behavior over time (Haynes, 1979).

Social marketing

Social marketing is a sub-discipline involved in the application of marketing principles to dissemination and adoption of social causes. It comes from the active, consumer oriented perspective, and has in the last decade largely supplanted the adoption of innovation perspective in large scale health interventions. Social marketing is an expanded concept of marketing, a discipline that has been defined by Kotler (1975):

"Marketing is the analysis, planning, implementation and control of carefully formulated programs designed to bring about voluntary exchanges of values with target markets for the purpose of achieving organizational objectives."

The strength of the social marketing perspective is its ability to develop institutional level strategies and interventions that are developed from the analysis of consumer needs and interests. Social marketing is distinguished from generic marketing by the nature of the product and the behavioral demands placed on the consumer/adopter (Kotler & Zaltman, 1971). It has been embraced by health care professionals undertaking large scale behavior change (Alexander & McCullough, 1981; Cooper, Kehoe and Murphy, 1978). In particular, the Stanford Heart Disease Prevention Program (SHDPP) has employed a social marketing framework for planning and implementation (Solomon, 1984) and the National High Blood Pressure Education Program has
embraced the methodology.

Social marketing uses the concepts of market segmentation, consumer research, concept development, communication strategies, behavioral strategies and exchange theory to design, implement and manage the acceptance of a product. As such it is not a discipline on its own, but a particular focus of marketing.

In the preventative health arena others with a marketing orientation have made contributions (Cooper, 1978; Venkatesan, 1978). The research from what these authors call 'health care marketing' is distinguished from social marketing of health on primarily a product basis. That is, the focus of health care marketing is the delivery of services, preventive and treatment, to consumers by physicians and hospitals (Cooper, 1979).

Both of these health related areas of marketing share basic concepts. First, marketing is seen as an exchange process (Kotler & Zaltman, 1971; Venkatesan, 1978). Something of value is exchanged in both directions. Marketing is distinguished from selling on the basis that it is consumer focused. The consumer's needs and wants are the starting point for developing a product of value. It is not a process of creating artificial demands to sell a pre-existing product.

Despite the consumer orientation and the distinction between marketing and selling, social marketing is not value free. The strategies used to bring about individual and social change are
designed to "fit" the consumer, but the decision of what behaviors are desirable is made by the marketer. Not everyone can be expected to agree that the behavior is indeed in the public interest (Laczniak, Lusch & Murphy, 1979). Although marketers maintain that marketing techniques are simply tools, distinguishable from the cause or idea that is being marketed, Laczniak et al. (1979) found in a survey of ethics experts that the majority agreed it is virtually impossible to separate the marketing effort from the idea itself. This reality has important implications for the use of powerful strategies such as psychological confrontation, fear arousal, etc. in social marketing campaigns. Further, it places responsibility on the change agent to recognize the values implicit in the behavior change effort (Winkler, 1979).

The process of social marketing

Social and health care marketing rely on the basic 4 P's of marketing to develop the appropriate marketing strategy. These are 1) the product, this may be discrete goods, or services or a concept such as donating blood; 2) price, including the psychological, effort and time costs as well as monetary expense; 3) promotion, the communication of product advantages, the most visible aspect of marketing; 4) place or distribution channels, where the product will be made available for exchange. A fifth P recognizes the importance of positioning the product so that its benefit appeal is apparent to the appropriate segments of the marketplace (Frederiksen & Riley,
Determining the approaches to each of the P's is the essence of developing the marketing mix, a complex, interactional process. Kotler suggests that this process in social marketing consists of the following seven steps: 1) problem definition, 2) goal setting, 3) target market segmentation, 4) consumer analysis, 5) influence channel analysis, 6) marketing strategy analysis, and 4) implementation and evaluation (Kotler, 1984).

Problem definition involves discerning the whys and why nots of the behavior of interest. For example, what are the psychological, social, cultural and economic factors that contribute to people maintaining stressful habits such as a sedentary lifestyle. Goal setting is important, although often difficult from a criterion measurement standpoint in social marketing (Bloom & Novelli, 1981).

Segmentation of target markets is a critical necessity in social marketing. Typically, the approach to planned social change has been on universal rather than focused marketing (Sheth & Frazier, 1982). That is, the entire population rather than segments were targeted. Segmentation recognizes that there are different perceived benefits for different groups within the market. Segmentation allows differentiated marketing, which involves the development of several product versions, each appealing to a different group (Kotler, 1976). The decision of which segment to serve involves market targeting. One of the classic problems in the marketing of social and health issues is the difficulty of targeting some segments, such
as the "chronic knownothings" and the precontemplators. These are the hard to reach segments who often are also the individuals most in need of the innovation.

The bases for segmenting markets have often been descriptive factors such as demographics, personality factors and lifestyle (psychographics) and media habits. Segmentation usually involves dividing the market by a succession of variables (Kotler, 1976). This may begin with basics such as frequency of use and level of awareness, and progress through such variables as attitudes, ability to pay and previous experience with the product.

Descriptive segmentation may be done on the basis of general lifestyle dimensions that are thought to relate to the products or issues to be marketed. A more focused approach is that of the product specific profile (Wells, 1975). A marketing questionnaire is given which contains items focused on psychographics, utilization information and demographics that relate to the different aspects of a product line.

The benefit segmentation approach to market segmentation identifies what are assumed to be the true causal factors that underlie valid market segments. This approach is based on being able to measure consumer value systems in detail (Haley, 1968).

All approaches to segmentation rely on marketing research and consumer analysis. The necessary information involves not only product-relevant information, but preferences with regard to media
use, distribution channels, and generic aspects of the product class (Sirgy, 1983).

Explorations of consumer behavior have attempted to mathematically model the consumer decision process (Engel, Blackwell & Kallat, 1978; Sirgy, 1983). The approach is to define the interrelationships of perceptual processes regarding products, brands and messages and the evaluation of these perceptions that lead to purchase decisions. Application of these models depends on data on consumer attitudes, preferences and behavior regarding the specific products or services under consideration. Segmentation of the marketplace can proceed once these data are available.

A number of statistical distance measures are used to determine the segments within a market. These measures relate the ratings of each respondent to those of every other respondent and determine clusters of individuals with similar rating patterns (Johnson, 1974). Hierarchical cluster analysis calculates the Euclidean distance between each cluster (starting with each individual forming their own cluster), and combines clusters that have the smallest distance at each step (Johnson, 1967). Optimal marketing solutions involve between three and seven clusters.

Murphy (1984) cautions that despite its importance, market segmentation has sometimes been oversold, especially by health program decision makers. Segmentation studies are expensive and time consuming. Sometimes they result in fragmentation, rather than
segmentation of the market. When this occurs, the market is divided into such small or unique groups that they are meaningless to an overall strategy.

This critique notwithstanding, market segmentation offers a valuable approach for understanding the levels and nature of health related interests and needs of the public. It provides a basis for directing individuals along the dimensions of readiness to act (Kotler, 1976).

While influence channels are pivotal to all marketing efforts, they present unique concerns in social marketing. The primary mass media channels are not available in the same ways for marketing issues that are in the public interest (Bloom & Novelli, 1981). For example, paid ads are discouraged not simply on the basis of the economics of the sponsoring agency, but also because if one agency or foundation were to begin to pay for advertising time, the networks might start demanding it of other non-profit, public interest groups.

By completing the first five steps in Kotler's social marketing process, the change agent has sufficient information to develop the necessary marketing strategies and tactics. Possible approaches to each of the five P's can be generated on the basis of the assembled information, and decisions made as to what the most effective strategies would be for each major market segment.

The final step in the process is implementation and evaluation. The two major activities are combined to highlight the importance of
gathering and evaluating data during implementation. Marketing evaluation is a process, rather than an outcome activity.

In sum, the strategies of marketing, in general, and the focus of social marketing, in particular, provide an excellent means of promoting positive health behavior on a large scale. The integration of this methodology with that of behavior change provides the potential for segmenting large populations on the basis of their readiness to undertake change and targeting long range strategies for effectively promoting positive behavior change.

**Changing health habits**

The health of the society is fundamentally dependent on the health-related habits of each of its members. Efforts to influence personal health behaviors have met with varied success, as discussed earlier. Indeed, such efforts have a very short history in the promotion of the public's health. One of the key areas for the management of health-related behaviors is that of stress control. Stress and its sequelae, coronary heart disease, alcoholism and various other forms of personal distress, have come to epitomize life in the 80's. The complexity of the phenomenon is reflected in the diversity of definitions and perspectives. McGrath (1970) has provided a widely accepted definition. He defines stress as "a (perceived) substantial imbalance between demand and response capability under conditions where failure to meet demand has important (perceived) consequences." (p. 20)
Investigations of this phenomenon have been conducted by different disciplines, each with their unique perspective and methodology. The organizational literature has taken primarily a descriptive, group focus. It is well recognized by managers and researchers alike, that some level of stress, or more accurately, arousal, is necessary for effective performance. Stress is also known to be detrimental to performance when it is endured at high levels over prolonged periods (Lehmann, 1974; Welford, 1973).

Traditional organizational and industrial research has investigated stress primarily on the basis of its source, whether role ambiguity or conflict, responsibility for others, the fit between the environmental supplies and an employee's motives (French, Rodgers & Cobb, 1974) or physical sources (Stellman & Daum, 1973). Stress is assumed to exist when strain is detected, that is, when there is a decrement in performance or the report of dysphoric affective states. Jackson & Schuler (1986) have proposed a model that can potentially integrate much of the organizational stress literature. They suggest that whatever the distal source of psychological stress, the immediate cause is uncertainty regarding one's well-being.

This view of stress is similar to the one that is commonly accepted in clinical application, the other primary arena of stress investigation. The clinical approach to stress comes primarily from an intervention and control perspective. Whereas the organizational
literature looks at stress among relatively "normal" individuals, the clinical literature focuses on individual stress pathology. In this arena, psychological stress is understood to result from a perceived threat to one's well-being, that is, stress results from one's cognitive appraisal of events and the uncertainty that personal resources are adequate to meet demand expectations (Lazarus, 1974). Despite this cognitive/perceptual perspective, the vast majority of clinical stress research rests on a methodology that conceptualizes stress as resulting from life change, or dramatic events (Dohrenwend & Dohrenwend, 1981; Holmes & Rahe, 1967).

The link between stress and stressful lifestyle patterns and the development of disease has been airly well documented (Caplan, Cobb, French, Harrison, & Pinneau, S., 1975; Rabkin & Struening, 1976; Rosenman, Brand, Jenkins, Friedman, Straus & Wurm, 1975; Sklar & Anisman, 1981; Weiman, 1981; Wolff, 1968). However, support is lacking for the premise that modifying the stress response will reduce disease (Kaplan, 1984). This notwithstanding, a large variety of stress interventions have been developed and implemented in the past decade. More recently, work organizations have become a primary intervention site, presumably because they are associated with high levels of stress. It is instructive to note that while the passive, public health type approach appears to have important application in the workplace, current stress interventions have been designed to change individual behavior. Their purpose is typically to develop
understanding and skills that inoculate against the effects of stress (Meichenbaum & Novaco, 1978).

The evidence that the typical multiple component stress management program delivered to relatively healthy employees can change individual behavior is small (Murphy, 1984a; Newman & Beehr, 1979). Well over two-thirds of the studies reviewed by Murphy (1984a) and Newman and Beehr (1979) did not involve a control group. The few that did have typically reported in-session response on physiological measures and/or post-program self report of improvement. These effects are not typically maintained over even short time periods. Benson and his colleagues have demonstrated that daily relaxation breaks can have a positive effect on blood pressure and self reports of well being (Peters, Benson & Peters, 1977). Carrington, Collings, Benson et al., (1980) demonstrated that home relaxation practice of New York Telephone employees resulted in reductions of symptoms ratings on the SCL-90. However, the control group also reported sizeable reductions.

Two NIOSH supported studies have employed two week programs in muscle relaxation and biofeedback to reduce stress among hospital nurses (Murphy, 1984b), and highway maintenance workers (Murphy, 1983). The nurses who were trained in muscle relaxation reported increases in their ability to cope with stress, the biofeedback group reported increases in the amount of work energy and coping effectiveness. Both treatment groups reported coping with stress
more frequently than the self-relaxation control group. Analysis of the highway maintenance workers' three month follow-up data indicates a significant (p<.05) EMG reduction in both groups relative to controls and a significantly (p<.05) larger reduction for the biofeedback group relative to the muscle relaxation group. However, both trained and control groups reported improvements in affective and symptom measures.

To date, only one empirical evaluation of a worksite stress management program has reported significant health related effects that were sustained over time. Ganster, Mayes, Sime & Tharp (1982) evaluated an 8 session cognitive behavioral stress management program delivered to highly stressed employees of a public agency (N = 79). Using a control group design with one replication, they assessed anxiety, depression, symptoms and urinary catecholamines at 3 month intervals. A statistically significant reduction in urinary catecholamines and irritation was produced in the first treatment group. Epinephrine had increased, but not to pretest levels, by the follow-up. In the replication, epinephrine increased following the program, but irritation and norepinephrine were reduced. The epinephrine measurements appear to have been influenced by extraneous factors, specifically, seasonal variation. The temporal variation may account for the abnormally low pre-test level of the waiting list control group. This non-program effect suggests the need for caution in interpreting the primary finding of urinary catecholamine
Given the lack of empirical evidence that stress interventions in the workplace can improve health related measures and reduce health risk and the virtually unsupported claim that such programs will improve morale, attendance and performance and reduce absences (Shea, 1981), it appears important to evaluate the components of the stress management process in relatively healthy individuals.

There are several clear limitations of current methodology of stress interventions. First, there is inadequate consideration of the behavior change process and, in particular, the time dimension of the various stages of change. Second, the current methodology conceives of stress as a discrete life event, with its management being a specific response or set of responses. The literature on coping provides a perspective of stress and coping as an ongoing process, that is closer to how stress occurs and is dealt with in life (Lazarus & Folkman, 1984).

The third limitation is the implicit assumption that managing stress is each individual's right and responsibility. This assumption is predicated on the belief that maintaining personal control is a possible and the optimal solution for managing stress. It espouses active coping through problem solving and changing situations.

The need to understand the self directed process of behavior change has been discussed previously. The second two limitations are
best discussed in terms of the several models of stress that recognize the person in context (Antonovsky, 1979; French, Caplan & Van Harrison, 1982; Moos, 1984). Figure 3 presents Moos' model of the relationship between personal and environmental factors and adaption.

The conceptual model posits that life stressors (Panel III) and the environmental and personal factors related to such stressors (Panels I and II) can shape social network resources and coping responses (Panels III and IV), as well as their effectiveness (Panel V). The bidirectional path reflects the fact that these processes are transactional and that reciprocal feedback can occur at each stage (Moos, 1984). Two aspects of this model are striking, the constancy of action that is required in the process of adaptation and the multiple levels of feedback involved. This suggests that the process of adaptation is an ongoing effort to manage stressful life circumstances. It is a process that requires continually changing responses and is, in large part, a learning phenomenon. This is the focus that attempts to promote health must take: the learning of new behaviors.

There is much that health promotion efforts can provide individuals in their attempts to improve their adaptation to life. Social learning theorists (Bandura, 1982) maintain that the exercise of influence over one's own behavior is not achieved by a feat of willpower. Self-regulatory capabilities require tools such as
Figure 3. A model of the relationship between personal and environmental factors and adaption (Moos, 1984).
personal commitment, awareness, skills, and social ability and the self assurance to use them effectively. All of these basic coping tools are learned. Deficits in coping can result from four different sources. First, an individual could be ignorant of necessary coping or change processes, yielding a restricted range of options. Secondly, an individual could be inept at utilizing one or more of these processes, resulting in either or both a restricted range of options for making change or non-reinforced attempts at change. Third, an individual who has sufficient knowledge and ability may be misapplying his/her efforts. Finally, the person may not engage in adequate self-management efforts because of a low sense of his/her ability to initiate and maintain the behavior(s) involved. When coping skills are underdeveloped and/or poorly used because of lack of belief in one's effectiveness, the possibility for personal self management decreases, and coping is inadequate, or in itself, stress producing. Conversely, the mastery of difficult experiences increases the sense of personal effectiveness. This sense of personal effectiveness or competence is integral to a sense of coherence, the term Antonovsky (1979) uses to describe that characteristic of individuals who possess a positive balance of the resources to adapt successfully to the demands of living. These he termed General Resistance Resources (GRR's), those personal, developmental and environmental characteristics that serve both to reduce perceived stress and to mediate the effects of stress. It is
the learning of these characteristics and skills that stress management interventions attempt to instill.

In order to provide the learning opportunities to enable healthful adaptation, a definitive model of the process of change must be available. This will undoubtedly involve an understanding of the self regulatory mechanism, self directed behavior change processes and the stages of behavior change. The current study is designed to clarify the personal needs for effective adaptation, the processes of change experienced, the stages of involvement in change, and the stress management products relevant to a population of individuals interested in the self management of stress.
RATIONALE AND HYPOTHESES

The development of effective health promotion interventions depends on a sound theoretical understanding of self-directed change. The theories of therapeutic change are helpful in defining the stages that individuals typically progress through in the process of changing. They are not sufficient, however, in two important ways. The theories of therapeutic change do not identify the behaviors and cognitions typically associated with each stage of change. Consequently, they are unable to address the fundamental question of **What works when?**

An understanding of the change processes typically associated with active progression through the stages of change will enable health promoters to answer another basic question, Who needs/wants what? That is, what types of interventions help people begin to consider the need for health related change, evaluate their ability to change, actually initiate change, and, finally, maintain new behaviors. Marketing techniques such as segmentation can be helpful in addressing this issue, but require a theoretical or empirical basis upon which to define the various market segments.

Recently, the research of Prochaska, DiClemente, and their colleagues has provided a theoretically-based, empirical analysis of the processes and stages of self-directed behavior change. They have developed and tested an instrument, the Processes of Change Questionnaire, which is designed to allow an individual rate the
level at which they are engaging in different activities commonly associated with attempts to change. Their research has investigated the questionnaires' utility in explaining the processes of smoking cessation, weight loss, and coping with depression (DiClemente & Prochaska, 1982; Prochaska & DiClemente, 1983; Prochaska & Norcross, 1983). In their preliminary research, they have identified twelve processes of change that are differentially associated with each of the five rationally defined stages of change—precontemplation, contemplation, action, maintenance and relapse. The processes of change are those specific activities that occur when a person is avoiding, initiating, or maintaining behavior change. For example, self-reevaluation is a major activity for someone who is contemplating personal change. It is, on the other hand, a threat to anyone who is trying to maintain a difficult change in their behavior (Prochaska & DiClemente, in press). Cigarette smoking provided an unusually objective behavior for the study of change processes. Subjects in this research could be objectively categorized into stages of change based on whether they lacked interest in smoking cessation (precontemplation stage), were thinking about stopping smoking (contemplation stage), were stopping smoking (action stage), were maintaining changes they had made (maintenance stage), or had stopped and then resumed smoking (relapse stage).
Other health-related behaviors are not so objectively defined, but have significant relationships to health. The management of stress is a case in point. The effective management of stress is one of the most fundamental health maintenance functions. Poorly managed stress is estimated by the National Institute of Medicine to account for from 50% to 80% of all hospital admissions. Further, stress is causally associated with seven of the ten leading causes of death in this country (USDHEW, 1979). Despite the difficulty of researching the self-management of stress, the need for an accurate model of coping makes it an important area for investigation.

The development of truly effective stress management interventions is likely to provide a significant contribution to the health of the society. However, it also seems quite likely that the current model for intervention, the multi-component stress management course, is not the most efficacious means of delivery. In addition to their lack of demonstrated effectiveness, such programs provide an impractical approach to the large-scale problem of stress. An approach that recognizes the range of needs and constraints of the population is necessary. The ability to design such programs depends to a large extent on a thorough understanding of how individuals undertake and maintain changes in the way they manage stress.

To address this need, the current research is designed to identify the behavioral, cognitive, and interpersonal processes associated with the initiation and implementation of stress-related
behavior change. The Processes of Change Questionnaire (Prochaska & DiClemente, 1983) will be used to assess these processes. The descriptive, predictive, and heuristic utility of this questionnaire in application to stress-related change will be evaluated. The participation of subjects in a variety of community stress-management programs will be assessed to determine the relationship between such participation and stages of change activity.
Hypotheses

Hypothesis 1:

The Processes of Change Questionnaire (POCQ) is a psychometrically reliable and valid instrument as demonstrated by:

1a - Measure of internal consistency above .80.

1b - A factor structure that replicates that defined by the work of Prochaska and DiClemente (1982).

1c - The convergent and discriminant validity of the POCQ.

Hypothesis 2:

On the basis of responses on the POCQ, groups of subjects can be identified as being in demonstrably different stages in the process of change.

2a - Subjects can be grouped by cluster analytic techniques on the basis of their relationships to one another on the POCQ.

2b - The identified clusters will evidence patterns of activity of the processes of change that will be similar to the patterns found in the groups of subjects at different stages of change by Prochaska and DiClemente (in press).

2c - The identified groups will demonstrate different levels of change activity regarding stress management, reflecting the different stages of change - precontemplation, contemplation, action, and maintenance.
METHODS

Design

The research design of this study is that of a passive observational study (Cook and Campbell, 1979). There is no experimental intervention. Subjects were assessed via self-report measures at three measurement points one month apart. Subjects were asked to keep track of their stress management activities throughout the study. All planned contact was via the mail system.

To control for the potential reactive effects of monitoring stress management activities, a small, non-equivalent control group received only the preliminary and final questionnaires, and were not asked to monitor their stress management activities.

Setting

The communities of the New River and Roanoke Valley regions of Virginia constitute the setting for this study. The combined population of individuals over eighteen years of age in these areas is approximately 172,544 (U.S. Dept. of Commerce, 1983). Table 4 provides general education and income information by primary geographical areas.

The region is distinctly rural, supporting a substantial number of farm and blue collar employees. The largest white-collar employer is Virginia Tech, a university employing approximately 5,000 individuals. The region has one major daily newspaper and numerous local papers. It is serviced by a number of radio stations.
Table 4

Population, education and income, 1979 Study Communities

<table>
<thead>
<tr>
<th></th>
<th>Montgomery County</th>
<th>Radford City</th>
<th>Roanoke City</th>
<th>Roanoke County</th>
<th>Salem City</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population over 18 years old</td>
<td>14,043</td>
<td>11,273</td>
<td>75,805</td>
<td>52,966</td>
<td>18,457</td>
</tr>
<tr>
<td>% of H.S. Graduates (25 yrs. and older)</td>
<td>63.4</td>
<td>62.0</td>
<td>57.5</td>
<td>70.0</td>
<td>61.2</td>
</tr>
<tr>
<td>Mean family income</td>
<td>—</td>
<td>—</td>
<td>$19,657</td>
<td>$25,486</td>
<td>$23,176</td>
</tr>
<tr>
<td>Mean household earnings</td>
<td>$15,817</td>
<td>$18,378</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

Department of Commerce, 1983
Health statistics indicate that the Roanoke Valley region has a higher mortality rate from several chronic diseases, including heart disease and cancer, than comparable areas in the State of Virginia and the nation (Center for Health Statistics, 1982). These diseases are thought to be associated with lifestyle characteristics involving modifiable behaviors. The statistics, and the potential for changing health habits, have motivated the regional office of the State Department of Health and the Council of Community Services to spearhead a task force of community service providers, businesses, clergy, and health professionals in an effort to address the lifestyle-related contributors to these alarming statistics (Roanoke Valley Council of Community Services, 1985).

Subjects

Adult men and women over eighteen years of age were recruited via various media channels to participate in this research. At the inception of the study in March 1985, 180 participants were involved; one month later, at the second assessment period, 156 subjects remained in the study. At the third measurement time, 141 subjects remained in the program. No monetary or other extrinsic incentives were offered for participation.

The original sample included 118 women and 62 men ranging in age from 18 to 65, with the largest segment (46%) being in the range from 26 to 35 years old. Less than 13% of the sample had not attended
college, while another 16% attended but did not graduate from college. A full 35% of the sample reported that they were college graduates, and another 37% reported completing a masters or doctoral education.

The majority of the sample (78%) was working full time and had been doing so for a substantial length of time. A full 18% of the sample indicated that they had been working more than 20 years. The type of work subjects reported was predominately professional (67%), with 24% of the sample holding skilled positions, 5% doing semi-skilled work, and 3% being students.

While the majority of the sample (68%) was married, the marital status of the remaining participants was fairly evenly divided between single, never married (16%), and divorced or separated (15%). Two percent of the sample was widowed.

While the majority of the sample had at least one child, 33% had none. Seventeen percent of the sample lived alone, 75% lived with two to three other people.

The median family income range of the sample was $31,000 to $40,000 annually, with only 22% of the sample earning less than $20,000 a year.

Measures

Table 5 provides a summary of the self-report scales administered with a brief description of each and the point at which
each was administered. The scales are grouped into those used to
describe the sample, the Descriptive measures; those used to predict
behavior, the Predictive measures; and the dependent or Criterion
measures. Tables 6 and 7 present the reliability of the primary
measures, the internal consistency, and test-retest measures,
respectively. Discussion of each measure follows.

Demographics: A brief (10-item) demographics questionnaire was used
to define relevant age, sex, education, and socioeconomic categories.

Processes of change: The stages and processes of change used in
managing stress were assessed using an adaptation of the Psychic
Distress - Processes of Change Questionnaire developed by Prochaska
and DiClemente (1984). This 60-item scale includes four to eight
items for each of twelve empirically-derived processes of change:
consciousness raising, self liberation, social liberation, self-
reevaluation, environmental reevaluation, counterconditioning,
stimulus control, reinforcement management, dramatic relief, helping
relationship, substance use, and interpersonal systems control. The
60-item scale employs a 5-point Likert-type scale which requires the
subject to rate how frequently the process was used in the past
month: 1 = not at all, 5 = repeatedly. These twelve processes are
differentially associated with four stages of change: pre-contempla-
tion, contemplation, action, and maintenance (Prochaska and
DiClemente, 1983).
<table>
<thead>
<tr>
<th>SCALE*</th>
<th>TIME OBTAINED</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics</td>
<td>T1</td>
<td>10 standard items including work related items.</td>
</tr>
<tr>
<td>Source of health information</td>
<td>T1</td>
<td>&quot;What is primary source?&quot; 1 item.</td>
</tr>
<tr>
<td>Interest in stress management materials</td>
<td>T1</td>
<td>Multiple options - interested or not. 5 items</td>
</tr>
<tr>
<td>Obstacles to managing stress</td>
<td>T1 &amp; T3</td>
<td>Indicate your biggest obstacle to managing stress.</td>
</tr>
<tr>
<td>Stress management need+</td>
<td>T1 &amp; T3</td>
<td>&quot;What is the main thing you need to do to manage this situation better?&quot;</td>
</tr>
<tr>
<td>Emotional distress</td>
<td>T1 only</td>
<td>&quot;Are you close to having a nervous breakdown?&quot; &quot;Have you thought of killing yourself?&quot; 4 items</td>
</tr>
<tr>
<td>Help Seeking</td>
<td>T1 only</td>
<td>Frequency of asking for help or advice. 3 items</td>
</tr>
<tr>
<td>(Pearlin &amp; Schooler, 1978)</td>
<td></td>
<td>Rating of health. 1 item</td>
</tr>
<tr>
<td>Health Status</td>
<td>T1 only</td>
<td></td>
</tr>
<tr>
<td>Identification of 1st and 2nd Most Difficult Stressor+</td>
<td>T1 only</td>
<td>1 item for each. (asked to indicate changes at T2 &amp; T3)</td>
</tr>
<tr>
<td>Chronic Diseases</td>
<td>T1 only</td>
<td>Indication of existence of 7 specific disabilities/diseases.</td>
</tr>
</tbody>
</table>

* All scales are scored so higher score is better. E.g., higher stress score = less stress.
+ Question specifically focused on primary or second most difficult stressor.
Table 5 (cont'd)

<table>
<thead>
<tr>
<th>SCALE*</th>
<th>TIME OBTAINED</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Stress - Anger, Anxiety &amp; Depression (Cobb, 1970)</td>
<td>T1, T2, T3</td>
<td>Frequency rating of current affect. 13 items</td>
</tr>
<tr>
<td>Health Habits</td>
<td>T1 &amp; T3</td>
<td>Eating, sleeping, caffeine, smoking frequency rating. 4 items</td>
</tr>
<tr>
<td>Contributors to Stress Management</td>
<td>T1 &amp; T3</td>
<td>Rating of contribution that exercise, hobbies, values, not drinking, etc. have on current ability to manage stress. 11 items</td>
</tr>
<tr>
<td>Weekly Average Stress Management Activities</td>
<td>T2 &amp; T3</td>
<td>Weekly average number of times exercised, had fun, got organized, etc. 10 items</td>
</tr>
<tr>
<td>Activities attended in previous month</td>
<td>T2 &amp; T3</td>
<td>Endorsement of attendance of specific programs including 1 bogus item, 7 items</td>
</tr>
<tr>
<td>Stress management books</td>
<td>T2 &amp; T3</td>
<td>Endorsement of whether books were read and what they were.</td>
</tr>
<tr>
<td>Rating of coping with each stressor+</td>
<td>T1, T2, T3</td>
<td>1 item for each</td>
</tr>
<tr>
<td>Stress management strategies used to cope with 2 main stressors+</td>
<td>T2 &amp; T3</td>
<td>15 items for each option to identify other strategies</td>
</tr>
</tbody>
</table>

* All scales are scored so higher score is better. E.g., higher stress score = less stress. 
+ Question specifically focused on primary or second most difficult stressor.
### Table 5 (cont'd)

<table>
<thead>
<tr>
<th>SCALE*</th>
<th>TIME OBTAINED</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life events summary</td>
<td>T1 &amp; T3</td>
<td>Indicate number of stressful events &amp; impact.</td>
</tr>
<tr>
<td>Processes of Change Questionnaire</td>
<td>T1 &amp; T3</td>
<td>59 items - 12 scales/processes of change plus 9 items - 2 scales related to negative coping from Lazarus' Ways of Coping Checklist.</td>
</tr>
<tr>
<td>Readiness to Make Change</td>
<td>T1 only</td>
<td>&quot;How ready are you to make changes in order to manage stress better?&quot;</td>
</tr>
<tr>
<td>Self Efficacy in Stress Management</td>
<td>T1 &amp; T3</td>
<td>Confidence/expectancy and outcome ratings in 5 areas of stress management. (10 items)</td>
</tr>
<tr>
<td>Stress Management Beliefs (Health Belief Model)</td>
<td>T1 &amp; T3 (Different versions)</td>
<td>Rating of seriousness, vulnerability and value of stress and stress management. T1 - 5 items, T3 - 6 items</td>
</tr>
<tr>
<td>Motivation for Control of Health</td>
<td>T1 only</td>
<td>Rating of motivation to control life events and health. 6 items</td>
</tr>
<tr>
<td>Job Satisfaction</td>
<td>T1 &amp; T3</td>
<td>&quot;All in all how satisfied are you with your job?&quot; 4 items</td>
</tr>
</tbody>
</table>

* All scales are scored so higher score is better. E.g., higher stress score = less stress.

+ Question specifically focused on primary or second most difficult stressor.
Table 6

Internal Consistency Reliability Measure

<table>
<thead>
<tr>
<th>Coefficient Alpha</th>
<th>Scale Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>.90</td>
<td>Processes of Change Questionnaire (Prochaska &amp; DiClemente, 1983)</td>
</tr>
<tr>
<td>.86</td>
<td>State stress (Cobb, 1970)</td>
</tr>
<tr>
<td>.81</td>
<td>Coping activities - Stressor 1</td>
</tr>
<tr>
<td>.82</td>
<td>Coping activities - Stressor 2</td>
</tr>
<tr>
<td>.90</td>
<td>Weekly average of Stress Management activities</td>
</tr>
<tr>
<td>.82</td>
<td>Self Efficacy</td>
</tr>
<tr>
<td>.79</td>
<td>Contributors to Stress Management</td>
</tr>
<tr>
<td>.69</td>
<td>Motivation for control of health (Kirscht, 1972)</td>
</tr>
<tr>
<td>.59</td>
<td>Life Events Summary</td>
</tr>
<tr>
<td>.43</td>
<td>Beliefs about health/stress</td>
</tr>
<tr>
<td>.41</td>
<td>Health habits</td>
</tr>
</tbody>
</table>
Table 7

Test - Retest Reliability

<table>
<thead>
<tr>
<th>Scale (POCQ Factors)</th>
<th>T1 - T2</th>
<th>T2 - T3</th>
<th>T1 - T3</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1 - Consciousness Raising</td>
<td></td>
<td></td>
<td>.77*</td>
</tr>
<tr>
<td>F2 - Self Reevaluation</td>
<td>.66*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F3 - Environmental Reevaluation</td>
<td></td>
<td>.61*</td>
<td></td>
</tr>
<tr>
<td>F4 - Self Liberation</td>
<td></td>
<td></td>
<td>.58*</td>
</tr>
<tr>
<td>F5 - Social Liberation</td>
<td></td>
<td></td>
<td>.66*</td>
</tr>
<tr>
<td>F6 - Counterconditioning</td>
<td></td>
<td></td>
<td>.69*</td>
</tr>
<tr>
<td>F7 - Stimulus Control</td>
<td></td>
<td></td>
<td>.64*</td>
</tr>
<tr>
<td>F8 - Contingency Management</td>
<td></td>
<td></td>
<td>.70*</td>
</tr>
<tr>
<td>F9 - Helping Relationship</td>
<td></td>
<td></td>
<td>.65*</td>
</tr>
<tr>
<td>F10 - Dramatic Relief</td>
<td></td>
<td></td>
<td>.70*</td>
</tr>
<tr>
<td>F11 - Interpersonal Control</td>
<td></td>
<td></td>
<td>.56*</td>
</tr>
<tr>
<td>F12 - Substance Use</td>
<td></td>
<td></td>
<td>.37*</td>
</tr>
</tbody>
</table>

+ p < .03

* p < .0001
Table 7 (continued)

<table>
<thead>
<tr>
<th>Scale</th>
<th>T1 - T2</th>
<th>T2 - T3</th>
<th>T1 - T3</th>
</tr>
</thead>
<tbody>
<tr>
<td>(POCQ Factors)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State Stress (Cobb, 1970)</td>
<td>.61*</td>
<td>.78*</td>
<td>.66*</td>
</tr>
<tr>
<td>Coping Stressor 1</td>
<td>.41*</td>
<td>.48*</td>
<td>.45*</td>
</tr>
<tr>
<td>Contributors to Stress Management</td>
<td></td>
<td></td>
<td>.50*</td>
</tr>
<tr>
<td>Health Habits</td>
<td></td>
<td></td>
<td>.80*</td>
</tr>
<tr>
<td>Weekly Average Stress Management Activities</td>
<td>.39*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategies for Coping with Stressor 1</td>
<td></td>
<td></td>
<td>.19+</td>
</tr>
<tr>
<td>Strategies for Coping with Stressor 2</td>
<td></td>
<td></td>
<td>.20+</td>
</tr>
</tbody>
</table>

+ p < .03

* p < .0001
Nine items, adapted from Lazarus' Ways of Coping Checklist (1980), have been added to evaluate the processes of self-blame and wishful thinking. These negative coping strategies have been suggested to predict lack of positive movement through the stages of change (Prochaska, personal communication, Dec. 5, 1984).

The wishful-thinking and self-blame items were adapted to correspond to the 5-point response scale of the Processes of Change Questionnaire. The score for each change process is obtained by summing the scores within the scales. See the final page of Appendix F for specific scoring information.

The internal consistency of the original ten processes of change assessed in the smoking cessation sample (N = 872) (Prochaska & DiClemente, 1983) ranged from alpha coefficients of .78 for reinforcement management to .91 for dramatic relief, with all other coefficients between these two extremes.

Two additional scales, Interpersonal systems control and Substance use, were subsequently identified. In this later research, they attempted to determine how psychotherapists treat themselves and their clients for psychological distress (Prochaska & Norcross, 1983). The internal consistency of the two additional scales was not specifically reported, but Cronbach's Alpha is in the range of .66-.93.

The internal consistency of the overall scale in the current research was .90 (See Table 6). The twelve subscales or processes
had coefficient alphas ranging from .63 to .89.

Stress level: Perceived stress was assessed using a 13-item scale developed by Cobb (1970). The internal reliability (coefficient alpha) for the scale has been reported to be .80 and .81 (Ganster, Mayes, Sime & Tharp, 1982). In the current research it achieved a coefficient alpha of .86. The scale appears to tap affectual components of stress, depression, anger, and irritation, which are rated on a 4-point frequency scale. These scales were found to be the most sensitive reflection of change in self-reported stress level in an earlier stress management intervention study (Riley, Frederiksen & Winett, under review).

Motivation for Control of Health: This scale, developed by Kirscht (1972), is composed of six items that assess motivation to assume responsibility or control over one's life and health. Three items assess general motivation for control and three items assess specific motivation to take control of health. A 7-point, Likert response scale ranges from agree completely to disagree completely. Motivation for control of health has been found by Kirscht (1972) and Dabbs and Kirscht (1971) to be a better predictor of subjects' health related action than measures of expectancy regarding health such as the Health Locus of Control (Wallston, Wallston, Maides & Caplan, 1976).
The psychometric properties of this scale were drawn from those of the larger scale in which it was embedded. The internal consistency is reported for each set of three items, with the intercorrelations ranging from .20 - .48. The six motivation items yielded a split half reliability of .73 (Kirscht, 1972). In the present research this scale demonstrated an internal reliability coefficient of .69.

Health habits and mental stress: Health habits were assessed using frequency ratings to identify the quality of sleep, eating habits, smoking habits, and caffeine intake. These items were used both individually and combined as a scale. The coefficient alpha of the scale was .41.

Seven stress-related, chronic illnesses were identified for subjects as a means of assessing the existence of strains. Additionally, subjects were asked to identify any other chronic illnesses they experienced. The internal consistency was .55.

Four questions relating to past history and current experience of mental distress and suicidal thoughts were used to identify highly stressed subjects. Those who endorsed these questions so as to indicate severe dysfunction and the non-availability of professional help were contacted to assess the need for referral. Only four people were identified. Each was contacted and spoken with privately to ensure that they were not in need of direct psychological intervention. Only one individual was referred for counseling; the
others reported either that they were well supported by family or had received psychotherapy. The individual referred for counseling was not included in the research. All subjects received the explanation that this project was not designed to provide therapeutic assistance, but simply to provide information on stress management.

Help seeking: This 3-item scale was taken from the coping scale used by Pearlin and Schooler (1978) that they identified through Principal Components Analysis with Varimax Rotation. The questions were used to assess the effectiveness of coping with specific stressors. Factors were identified for each major category of stressor. The factor loadings were from .70-.73 for the marital coping, and .58-.77 for coping with parental roles. In their study of coping responses of 2300 individuals representative of people between the ages of 18 and 65 in the Chicago area, Pearlin and Schooler (1978) found that in the areas of marriage and parenthood, self-reliance is more effective in reducing stress than the seeking of help and advice from others. These authors posit that this somewhat surprising result may reflect the reality that help seekers are not necessarily help receivers. Perhaps the most effective copers may be those who have the ability to gather support without having to solicit it. In the current research the coefficient alpha was .56.

Job satisfaction: A 4-item job satisfaction measure developed at the Institute for Social Research at the University of Michigan (LoRocco,
House & French, 1980) was used to evaluate levels of job satisfaction among those subjects who are employed. Job satisfaction is conceptualized to be indirectly related to job and life stress. It was used here for two purposes: (1) to evaluate the potential sensitization effects that stress management interventions may have, and (2) to evaluate the discriminative validity of the self-report measures of stress. Riley, Frederiksen, and Winett (under review) demonstrated an increase in job dissatisfaction following a standard, well-received worksite, stress management intervention, creating the necessity for assessing the potential sensitization effects of stress management interventions on job satisfaction. The internal consistency of the measure in this study achieved .80.

Health beliefs: Four questions assessing subjects' beliefs about the seriousness of stress, their vulnerability to stress consequences, the value of stress management activities, and their confidence in being able to learn stress management were rated on a Likert-type scale. Subjects identified the obstacles that prohibited them from effectively managing stress. The coefficient alpha of this measure was .26.

Self efficacy measure: Subjects' self efficacy in utilizing particular approaches to managing stress was assessed using a scale developed from the format used by Bandura (1982). On this measure, specific stress management activities were described. Subjects were
asked to rate on a scale of 1 to 10 both their confidence in being able to effectively perform the activity and the likelihood that doing so would help them manage stress better.

Stressful events: The relationship between stressful life events and adaptation and illness is a reliable, though moderate ($r=.30$) finding across numerous studies (Dohrenwend & Dohrenwend, 1974; Rahe, 1975). A fair amount of controversy regarding assessment methods has characterized this area of investigation. It appears that unpleasant life events are responsible for the impact on health and coping, and that at least in one study, the weighting of the impact of events increases the relationship for women but not men (Kale & Stenmark, 1983). The psychometric properties of the popular life change inventories are poor (Hurst, Jenkins & Rose, 1978). The number of life events included on the scale does not seem to relate to its ability to predict impact (Kale & Stenmark, 1983). Given these findings and the focus of this study on stress management behavior change rather than stress and its sequelae, it was determined that a simple assessment of the number of moderately and severely stressful events would be an adequate approach to the measurement of major life stresses. Subjects were also asked to rate the overall impact they felt these events had on them. The coefficient alpha of this measure was .59.
Current specific stressors: This measure required that the subject list his/her primary and secondary sources of stress. Each stress was rated by the subject on a scale of 1 to 10 as to how well they were currently coping with this stress. Subjects were asked to indicate for each stressor which of three types of learning needs they believed must be met for them to manage the stressor effectively. That is, did they need to learn something new, practice in order to become effective, or integrate an already learned coping strategy into their regular routine? Coping activities for each of the main stressors were assessed using the same 15-item scale for each stressor. The alpha coefficient for the Stressor 1 scale was .81, for the Stressor 2 scale was .82.

Contributors to stress management: Eleven activities that can contribute to stress management were rated by subjects on a 6-point, Likert-type scale to indicate the contribution each made to the subject's current management of stress. These included such items as taking vacations, limiting work hours, setting priorities, exercise, etc. The coefficient alpha of this measure was .81.

Stress management activity: In each mailing, subjects were given a calendar for the upcoming month on which formal community stress management activities were noted. On the same page, below the calendar, ten individual stress management activities were listed and identified by a letter. Subjects were encouraged to use this brief
letter code to record when they performed stress-management-related activities on the calendar. See appendix D. Subjects were instructed to develop a record, using the calendar, that would assist them in reporting their average weekly level of stress management activities. This strategy has been shown to be a reliable method of tracking subjects' activity in earlier research (Marcus, 1982; Winett, Neale & Williams, 1979). The weekly average of stress-management activities was assessed using a checklist format on which subjects indicated the average number of times per week that they engaged in various activities during the previous month. There were a number of general stress management activities listed, e.g. "Relaxed thoroughly and healthfully for at least one-half hour."

Additionally, specific stress management events presented in the community during the previous month were listed. In each of these lists, one bogus event was embedded in order to assess the reliability of the measure. The results of this suggest that responses were reliable, with only one subject endorsing the bogus item in any mailing.

Significant other corroboration: Each month a random 15% to 20% of subjects' reports of stress management activity were validated by contacting significant others. These collaterals were requested to first estimate the average number of times per week three observable activities were engaged in by the subject. They were asked to agree or disagree that the subject attended each of the events they
indicated they attended that month. The collaterals were asked to indicate the two prime sources of stress for the subject and to rate how well the subject managed their stress during the previous month.

While the responses tended to be somewhat variable, the key factor in effectively corroborating the subjects' behavior was the relationship of the contact person to the subject. A large number of subjects (N = 110) gave contacts who did not live with them, while 30 more declined to have anyone contacted. When questions about a subject's stressors and coping behavior were asked of non-relatives, the contact very frequently said they had no knowledge of the issue or that they were simply guessing at an answer. Of those subjects who provided a contact person with whom they lived, the overall reliability (computed by the formula: agreements/disagreements + agreements) on 13 questions was .63. The reliability of those items that involve observation of overt behavior, alcohol consumption, cigarette smoking, caffeine intake, attendance at stress management programs, and reading stress management books, was .82. The agreement between subjects' reports of their two main stressors and their spouse or housemate's report was .77.

Subjects' preferences of program format and materials were assessed using a three-option scale to rate seven alternatives. Subjects' primary source of information about health and stress management was assessed using a multiple choice format. Subjects' program needs were assessed on the basis of their responses to
questions about what the first or main thing was that they needed to do to manage stress better. Focusing on each of their two primary stressors, subjects identified whether they needed to:

(1) learn to do something differently (didn't know how to manage the stressor)
(2) practice managing the stressor (knows how)
(3) make good management a regular habit
PROCEDURE

This study was conducted over a five-month period, with data collection occurring during the middle three months. Formal contact with participants was conducted through the mail system. Subjects received monthly mailings which included one or more of the following: stress management resource information, monitoring calendars, and questionnaires. Completed questionnaires were returned in self-addressed envelopes via the mails.

Recruitment

Several low-cost information strategies using various communication channels were employed to recruit subjects for this research. Announcements of the Project (see Appendix A) described it as a health education program (the Stress Management Resource Project) in which participants would receive information on community stress management events and reading materials and would be required to complete three sets of questionnaires involving approximately one hour of their time.

The recruitment period lasted from December 1984 through February 1985. Newspaper announcements were carried by one regional and four local newspapers for a total of seven instances. One feature article was carried in a local newspaper. Radio announcements of the program were made from four to six times on local radio stations.
The presidents or program chairs of twenty-two civic groups and organizations were contacted with the aim of involving their members in the Project. Seven organizations agreed to disseminate the Project descriptions and application forms at their meetings. See Appendix A. Brief lectures were presented to five organizations (approximately 175 individuals) describing the need for stress management and the nature of the Stress Management Resource Project.

Finally, direct-mail announcements of the Project were sent via interoffice mail to a random third of the staff and faculty in residence at Virginia Tech (approximately 1800 individuals). The announcement provided a minimum number of details and directed recipients to return the bottom of the announcement if they were interested in the Project. See Appendix A.

The method by which everyone who expressed interest in the program had initially learned of the Project was evaluated. As reported, approximately 174 individuals were directly contacted via brief presentations given to civic and professional organizations. From these 175, 17 people agreed to participate (a response rate of 10%), with 10 remaining one month later, resulting in an adjusted participation rate of 6% or the group presentation recruitment strategy.

The direct-mail information channel involved approximately 1800 recipients. Of these, approximately 170 responded and were sent initial materials (a response rate of 9.4%). However, only 130 of
these individuals actually joined the Project, resulting in a participation rate of 7%. One month later 4.6% of the original contacts were involved in the Project (N = 84).

Interestingly, a similar mailing was sent to 90 individuals who had participated in an earlier study of stress. The response rate for this group that had apparently made a prior commitment to understanding their stress was 39% (N = 35). One month later 30 individuals remained in the Project for an adjusted participation rate of 33%. This was the best response rate obtained through written contact.

It was naturally not possible to compute specific response rates for newspaper and radio communication strategies. Twenty-two individuals indicated that they learned of the Project through the newspaper articles and announcements. One month later 12 participants remained. No respondent indicated having learned of the Project from radio announcements.

Additionally, 23 individuals entered the Project who were direct, usually previously known, contacts of the investigator. Thirteen of these remained after one month.

Twenty-three individuals learned of the Project through other individuals who encouraged them to participate. None of these subjects dropped out of the Project. It is worthwhile to note that approximately one-third of these are health professionals who were
encouraged to join the Project by a Staff Development educator at their hospital.

In sum, the best response and compliance was demonstrated in the group who had previously indicated interest in the topic. Of the strategies targeted at the general population, the direct presentation mode (talks to social groups and organizations) resulted in better response and compliance than the direct-mail or media announcements. However, the margin was not appreciably better, and the group presentation was costly in terms of time and effort. The direct-mail strategy appears to be the most preferable, although it involves an early additional period of drop-outs because respondents have inadequate information on which to evaluate the fit of the Project to their perceived needs.

The unplanned strategy of professional referral resulted in the best overall compliance. This method involved informing an educator in a health care setting of the project and his/her subsequent referral of a number of his/her staff to the program.

**Administration**

Individuals expressing interest (N = 280) in the Project were sent an introductory packet of materials which included:

* a cover letter

* Stress Management Resource Information (stress management events scheduled for the upcoming month and an annotated list of books and audiotapes for managing stress)

* consent forms (which described the project in detail)
* a stress management activity monitoring calendar

Those subjects who returned a consent form (N = 250) were mailed the preliminary questionnaire along with the Resource Information for March, a calendar, and cover letter at the beginning of the next month (Appendices D, E). One month later subjects (N = 180) again received the Resource information and calendar (Appendix D), and were asked to summarize their general stress management activities and the specific things they did to manage their two primary stressors.

At the beginning of the third month, subjects (N = 156) received the final questionnaire, a letter, and the Stress Management Resource Information (Appendix D). No monitoring calendar was included. Of these, 146 subjects returned the final questionnaire. The following month a letter of appreciation accompanied the final Stress Management Resource Information packet. No data was collected in the fifth month of the Project.
RESULTS

Reliability of measures

The reliability of self-report measures is a primary means of ensuring the validity of research results. The majority of the measures used in this study have been demonstrated to be sensitive and reliable in previous stress research. Additionally, most have significant face validity, and several have been demonstrated to have construct validity. The primary types of reliability estimation for paper and pencil measures are reported for each of the measures.

The internal consistency, or average inter-item correlation, of the primary measures is summarized in Table 6. This class of reliability coefficients, either Cronbach's Alpha or the Kuder-Richardson formula, is influenced by content sampling error as well as the heterogeneity of the behavior domain, the more heterogeneous, the lower the internal consistency. The acceptable range of internal consistency is .70 - .90 for the measurement of stable characteristics.

The internal consistency of the Processes of Change Questionnaire (POCQ) was .90 (and .92 at Time 3). While this suggests good reliability for the measure, it appears to contradict the assumption that the measure consists of multiple factors that reflect a distinct process of change.

The remaining measures appear to have acceptable levels of internal consistency to support the assumption that they are indeed measuring a unified concept or set of behaviors. There are however,
three exceptions. The measures of health habits, health beliefs and life events have internal reliability coefficients less than .70. The first of these, the health habits scale, measures very different aspects of individual behavior, e.g. sleep habits and dietary patterns, and consequently would be expected to have only a moderate level of internal consistency.

The measure of health beliefs should optimally have a higher level of internal consistency as it purports to measure a general outlook on stress and health. Developed from the Health Belief Model for the purposes of this study, it does not appear to be measuring a unified construct, a problem previously noted in research on the Health Belief Model (Becker, Maiman, Kirscht, Haefner, Drachman, & Taylor, 1979).

The Life Events scale is a brief summary of the number of moderate and severely stressful events the subject has encountered in the past three months and a rating of their impact. In addition to the fact that two different issues were assessed, observation of individual responses to this scale indicate that some subjects misunderstood the directions for completing the scale, which may have contributed to the low internal consistency measure.

The utility and meaning of items in a scale can be assessed by inspecting the item-total correlations. The item-total correlations of the POCQ are generally in the range between .45 and .69. This confirms the relationship of each item to the overall construct being
measured. Items 1, 16, 31, and 57 have item total correlations below 10. Of these four items, three of them relate to the use of drugs or medication to manage stress. Inspection of the frequencies of responses to these items indicates a significant lack of variability, with virtually all subjects denying use of medication or drugs to manage stress. The fourth item with low item-total correlation, "I associate less often with people who add to my stress." is the first item on the scale. This placement may account in part for inconsistent responding. However, the item has a range of variance and loads with items designed to reflect the same construct, interpersonal control, on Principal Components factor analysis.

Table 7 presents the test-retest reliabilities of the primary measures. Measurements were obtained at three intervals. The average time interval between these periods was one month. Not all measures were obtained at all three times, accounting for the instances of absent correlation coefficients.

A primary purpose of the research was to determine the validity and utility of the Processes of Change Questionnaire (POCQ) (Prochaska & DiClemente, 1983) in the area of self-change regarding stress. A fundamental assumption is that the POCQ factor structure validly represents the processes of change that underlie individual coping behavior.
Hypothesis la.

The internal consistency of the POCQ supports the assumption that it is a reliable measure.

This hypothesis is supported by an internal consistency of .90 on the first administration of the POCQ, and of .93 on the second administration of the scale.

Hypothesis lb.

The factor structure of the POCQ (Prochaska & DiClemente, 1983), revised to identify stress management behaviors, will replicate that defined by Prochaska and DiClemente.

Factor analysis is used to study the structure of a set of variables. It defines the underlying variables which account for covariation among the variables. It accomplishes this by fractionating the common variance associated with a variable (while ignoring unique variance) and assigning it to a new set of variables or factors (Weiss, 1971).

Principal factors analysis was conducted on the POCQ utilizing data from 372 subjects, including the subjects in the pilot study and the current research. In the original factor analytic development of a scale, a sample that has ten times the number of observations as variables is recommended (Weiss, 1971). However, for the current purpose of validating the previous factor analysis, the sample size is adequate.

The item intercorrelation matrix was significantly different from that of a random variable correlation matrix, (p < .001), fulfilling the primary assumption required to do factor analysis. In
order to extract reliable and interpretable factors, the factors were rotated utilizing both orthogonal and oblique rotations. Several factor analytic solutions will be reported, including the unrestricted and restricted orthogonal solutions and the restricted oblique solution.

The orthogonal rotation (Varimax procedure on SAS) makes the same assumption as the Principal Components procedure, that the factors are uncorrelated. The factors produced by principal components were rotated to maintain a 90 degree angle between them, producing results that were relatively simple to interpret. This approach was used by Prochaska and DiClemente in the development of the factor structure (Prochaska & DiClemente, 1983).

The unrestricted Varimax solution produced fifteen factors with eigenvalues greater than 1.0. The total variance explained by these fifteen factors was 38.9%. Based on the relative change in the eigenvalues and proportion accounted for by each factor, no more than the first seven factors appear to have strong linear relationships, all factors beyond 7 account for less than 3% of the total eigenvalue.

Similarly, when the criterion of .40 for a factor loading was used to assign items to factors, the resulting factors beyond 7 were either uninterpretable or contained too few items (three or less) to adequately represent a construct. As this procedure excluded twenty questions from the original scale, another factor analysis employing
Varimax rotation (an orthogonal solution) was conducted in which the total number of possible factors was limited to seven.

In this analysis, the partial correlations between items controlling for all other variables is small, ranging from +.01 to +.31, with the vast majority below .10. Because the original correlations were consistently higher, ranging from .30 to .92, the data appear to be appropriate to the common factor model. This conclusion is reinforced by Kaiser's measure of sampling adequacy (SMA) which is a summary of how small the partial correlations are relative to the ordinary correlations (Sarle & Sall, 1982). Values above .80 are considered good. The SMA value in this analysis is .86.

Employing a criterion of .40 for inclusion of an item on a factor, the restricted (N = 8) principal components orthogonal solution produced five factors that are interpretable and consistent with theoretical expectations regarding underlying processes. The first factor contained twelve items and accounted for 5.89% of the variance. This factor contained all of the Self Reevaluation scale as defined in the original scale, the majority of the Environmental Reevaluation scale items and three Dramatic Relief items. It appears to be reflecting an emotional reevaluation process.

Factor II contained twelve items and accounted for 4.74% of the variance. It included all of the items from the original Self Liberation scale, two cognitive Counterconditioning items and four
items from the Consciousness Raising scale. Interpretation of this scale suggests it is tapping a self liberating and cognitive self management process.

The third factor accounted for 3.90% of the variance and included six items. All items pertained to social support, and virtually replicated the Helping Relationships scale.

The fourth factor accounted for 3.76% of the variance and contained six items, all of those from the original Stimulus Control scale and two from Counterconditioning. This factor is fairly clearly a behavioral self management factor.

The fifth factor accounted for 3.02% of the variance and contained five items. The factor appears to relate to rewarding not being stressed.

The sixth and seventh factors involve items from the Substance Use and Dramatic Relief scales. They account for 2.62% and 2.18% of the variance respectively. Both seem to relate to relief from stress.

The orthogonal seven factor solution using a criterion of a factor loading of .40 or better omitted seven items that were on the original scale. The first five of these factors are somewhat consistent with the processes of change defined by Prochaska, specifically reevaluation, self liberation and cognitive self management, helping relationships and management of rewards for not being stressed. However, they provide a less than satisfying
organization of the concepts, omit a large number of items and do not represent the entire model.

A solution employing an oblique rotation was performed because intercorrelation between the factors, i.e., the processes underlying change, seems likely. The oblique rotation permits the factors to become somewhat correlated with each other. Interpretation of the factors tends to be more complex, because the intercorrelations among the factors must be taken into account (Weiss, 1971).

The seven factor solution. In the oblique rotation the number of factors was restricted to seven because all of the previous analyses suggested that only seven factors could be distinguished. The total variance accounted for by the seven factors was 39.77%.

An initial criterion of a .45 factor loading (in contrast to .40) was used to assign items to factors because the intercorrelation between factors tended to increase loadings. A secondary assignment of the eight items that were unassigned at this criterion was made of items onto factors if their loading was .40.

Interpretation of the oblique factors resulted in scale definitions that were similar to those defined by the orthogonal method. Using the two step assignment process resulted in all but one item being included in the factors. Table 8 provides the items and their loadings for each factor. The letters in the left column indicate the subscale which contained the item on the original
Table 8

Factor Analysis of the Processes of Change Questionnaire Items & Loadings in each Factor Restricted factors (N = 7)

<table>
<thead>
<tr>
<th>Original scale names</th>
<th>New Factor Loading</th>
<th>New Factor Number</th>
<th>Number Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR - Consciousness Raising</td>
<td>0.54</td>
<td>10.</td>
<td>I struggle to alter my view of myself as a stressed person.</td>
</tr>
<tr>
<td>SR - Self Reevaluation</td>
<td>0.68</td>
<td>36.</td>
<td>I get upset when I think about my giving in to my stress.</td>
</tr>
<tr>
<td>SR</td>
<td>0.63</td>
<td>48.</td>
<td>I consider the fact that being content with myself includes changing my stress.</td>
</tr>
<tr>
<td>SR</td>
<td>0.65</td>
<td>50.</td>
<td>I consciously struggle with the issue that being stressed contradicts my view of myself as a caring and responsible person.</td>
</tr>
<tr>
<td>SR</td>
<td>0.77</td>
<td>52.</td>
<td>My tendency to get stressed makes me feel disappointed in myself.</td>
</tr>
<tr>
<td>ER</td>
<td>0.46</td>
<td>14.</td>
<td>I am beginning to think that people overcoming stress will make the world a better place.</td>
</tr>
<tr>
<td>ER</td>
<td>0.55</td>
<td>32.</td>
<td>I stop to think that my stress is hurting my environment.</td>
</tr>
<tr>
<td>ER</td>
<td>0.60</td>
<td>39.</td>
<td>I am considering the view that my friends and family deserve a stress-free environment in which to live.</td>
</tr>
</tbody>
</table>
Table 8 (con't)

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ER</td>
<td>.60</td>
<td>47.</td>
<td>I consider the view that stress can be harmful to an interpersonal environment.</td>
</tr>
<tr>
<td>ER</td>
<td>.71</td>
<td>53.</td>
<td>I am considering the idea that the world would be a better place without my being stressed.</td>
</tr>
<tr>
<td>CR</td>
<td>.51</td>
<td>43.</td>
<td>Dramatic portrayals about stress affect me emotionally.</td>
</tr>
<tr>
<td>DR</td>
<td>.62</td>
<td>54.</td>
<td>I react emotionally to warnings about stress.</td>
</tr>
<tr>
<td>DR</td>
<td>.59</td>
<td>55.</td>
<td>Warnings about health hazards of stress move me emotionally.</td>
</tr>
<tr>
<td>CM</td>
<td>.33</td>
<td>33.</td>
<td>I can expect to be rewarded by others if I don't act stressed.</td>
</tr>
<tr>
<td>CM</td>
<td>.43</td>
<td>45.</td>
<td>I am rewarded by others if I don't act stressed.</td>
</tr>
</tbody>
</table>

**Factor II (10 Items)**

**PERSONAL LIBERATION**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SL</td>
<td>.52</td>
<td>5.</td>
<td>I tell myself I can choose to change or not.</td>
</tr>
<tr>
<td>SL</td>
<td>.56</td>
<td>11.</td>
<td>I use willpower to keep from getting stressed.</td>
</tr>
<tr>
<td>SL</td>
<td>.71</td>
<td>20.</td>
<td>I tell myself I am able to overcome my stress if I want to.</td>
</tr>
<tr>
<td>SL</td>
<td>.64</td>
<td>26.</td>
<td>I tell myself that if I try hard enough I can keep from being stressed.</td>
</tr>
<tr>
<td>SL</td>
<td>.58</td>
<td>28.</td>
<td>I make commitments not to become stressed.</td>
</tr>
<tr>
<td>CC</td>
<td>.57</td>
<td>22.</td>
<td>When I am becoming stressed, I try to relax myself.</td>
</tr>
<tr>
<td>IC</td>
<td>.49</td>
<td>24.</td>
<td>I try to change personal relationships that are stressful.</td>
</tr>
<tr>
<td>CR</td>
<td>.46</td>
<td>8.</td>
<td>I try to understand the historical causes of my stress.</td>
</tr>
<tr>
<td>CR</td>
<td>.51</td>
<td>27.</td>
<td>I read books that help me release my stressful feelings.</td>
</tr>
<tr>
<td>CR</td>
<td>.53</td>
<td>56.</td>
<td>I try to understand why I get stressed.</td>
</tr>
</tbody>
</table>
Table 8 (con't)

<table>
<thead>
<tr>
<th>Factor III</th>
<th>(7 Items)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HELPING RELATIONSHIPS</strong></td>
<td></td>
</tr>
<tr>
<td>HR .81 4.</td>
<td>I can be open with at least one special person about my stressful experiences.</td>
</tr>
<tr>
<td>HR .85 13.</td>
<td>I have someone who understands my problems with stress.</td>
</tr>
<tr>
<td>HR .89 21.</td>
<td>I have someone who listens when I need to talk about my stress.</td>
</tr>
<tr>
<td>HR .87 44.</td>
<td>I have someone whom I can count on when I'm having problems with stress.</td>
</tr>
<tr>
<td>CM .46 18.</td>
<td>Other people in my daily life try to make me feel good when I overcome my stress.</td>
</tr>
<tr>
<td>DR .55 19.</td>
<td>I try to express feelings related to stress.</td>
</tr>
<tr>
<td>IC .37 7.</td>
<td>I seek out people who support my changing.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Factor IV</th>
<th>(10 Items)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BEHAVIORAL SELF-MANAGEMENT</strong></td>
<td></td>
</tr>
<tr>
<td>SC .61 34.</td>
<td>I keep things around my place of work that remind me not to get stressed.</td>
</tr>
<tr>
<td>SC .66 37.</td>
<td>I remove things from my home that remind me of stress.</td>
</tr>
<tr>
<td>SC .73 41.</td>
<td>I remove things from my place of work that remind me of stress.</td>
</tr>
<tr>
<td>SC .68 51.</td>
<td>I put things around my home that remind me not to get stressed.</td>
</tr>
<tr>
<td>CC .47 38.</td>
<td>When I am beginning to feel stressed, I think about something else.</td>
</tr>
<tr>
<td>CC .47 40.</td>
<td>I do something else instead of worrying when I need to deal with tension.</td>
</tr>
<tr>
<td>CC .50 42.</td>
<td>I find that doing things is a good substitute for feeling stressed.</td>
</tr>
</tbody>
</table>
Table 8 (con't)

<table>
<thead>
<tr>
<th>IC</th>
<th>.61</th>
<th>34.</th>
<th>I associate less often with people who add to my stress.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC</td>
<td>.43</td>
<td>25.</td>
<td>I leave places where other people are adding to my stress.</td>
</tr>
<tr>
<td>CC</td>
<td>.43</td>
<td>6.</td>
<td>I engage in some physical activity when I am beginning to feel stressed.</td>
</tr>
</tbody>
</table>

**Factor V (10 Items)**

**SOCIAL LIBERATION/REWARD**

<table>
<thead>
<tr>
<th>SocL</th>
<th>.69</th>
<th>29.</th>
<th>I reward myself when I don't give in to stress.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SocL</td>
<td>.64</td>
<td>23.</td>
<td>I do something nice for myself in return for not giving in to my stress.</td>
</tr>
<tr>
<td>SocL</td>
<td>.54</td>
<td>9.</td>
<td>I notice that some public places are designed to help reduce stress.</td>
</tr>
<tr>
<td>SocL</td>
<td>.40</td>
<td>30.</td>
<td>I notice that stressed people are asserting their rights.</td>
</tr>
<tr>
<td>SocL</td>
<td>.50</td>
<td>35.</td>
<td>I find society changing in ways that make it easier for stressed people.</td>
</tr>
<tr>
<td>SocL</td>
<td>.49</td>
<td>49.</td>
<td>I encounter social situations designed to reduce the stress of people.</td>
</tr>
<tr>
<td>CR</td>
<td>.43</td>
<td>3.</td>
<td>I read about people who have successfully changed.</td>
</tr>
<tr>
<td>CR</td>
<td>.51</td>
<td>12.</td>
<td>I recall information people have personally given me on the benefits of overcoming my stress.</td>
</tr>
<tr>
<td>CR</td>
<td>.53</td>
<td>15.</td>
<td>I think about information from articles and advertisements on how to overcome stress.</td>
</tr>
<tr>
<td>SC</td>
<td>.40</td>
<td>2.</td>
<td>I see indications in some public places of others trying to help people cope with stress.</td>
</tr>
</tbody>
</table>
### Table 8 (continued)

#### Factor VI
**SUBSTANCE USE/INFORMATION SEEKING**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CR</td>
<td>.63</td>
<td>46. I look for information related to stress.</td>
</tr>
<tr>
<td>SU</td>
<td>.90</td>
<td>57. I use tranquilizers to relax.</td>
</tr>
<tr>
<td>SU</td>
<td>.88</td>
<td>59. I take a drink of alcohol to feel better.</td>
</tr>
</tbody>
</table>

#### Factor VII
**SUBSTANCE USE/EMOTIONAL RELIEF**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SU</td>
<td>.77</td>
<td>16. I take some type of medication for my stress.</td>
</tr>
<tr>
<td>SU</td>
<td>.74</td>
<td>31. I take some type of drugs for my stress.</td>
</tr>
<tr>
<td>DR</td>
<td>.53</td>
<td>17. Remembering studies about illnesses caused by stress upsets me.</td>
</tr>
</tbody>
</table>
version. Table 9 lists the eigenvalues and variance accounted for by each factor.

Factor I contains 15 items and accounts for 8.10% of the variance. It contains the items of the original Self and Environmental Reevaluation scales plus several others that relate to awareness of how the individual will be treated if they manage stress well. Factor I is titled Reevaluation.

Factor II contains ten items and accounts for 6.77% of the variance. It contains all of the original Self Liberation items and a number of items that relate to release from old ways of thinking about stress, including many items from the original Consciousness Raising scale. This is titled Personal Commitment because there is a high degree of assertiveness regarding the possibility of changing.

Factor III contains seven items and accounts for 4.58% of the variance of the entire scale. This is titled Helping Relationships as it replicates that scale in the original analysis.

Factor IV contains ten items and accounts for 5.57% of the variance. This factor contains all of the items from the Stimulus Control scale and a number from the Counterconditioning and Contingency Management scales. It is a Behavioral Self Management scale.

Factor V contains ten items and accounts for 7.15% of the variance. This factor contains items from the Social Liberation and Consciousness Raising scale. It seems to reflect awareness of that
Table 9
Processes of Change Questionnaire
Factor Analysis Eigenvalues and Variance
N = 372

<table>
<thead>
<tr>
<th>Factor Number</th>
<th>Factor Name</th>
<th>Eigenvalues</th>
<th>Proportion of Variance Accounted for</th>
<th># of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Self &amp; Environmental Reevaluation</td>
<td>11.80</td>
<td>8.10%</td>
<td>15</td>
</tr>
<tr>
<td>II</td>
<td>Personal Commitment</td>
<td>4.88</td>
<td>6.77%</td>
<td>10</td>
</tr>
<tr>
<td>III</td>
<td>Helping Relationships</td>
<td>2.90</td>
<td>4.58%</td>
<td>7</td>
</tr>
<tr>
<td>IV</td>
<td>Behavioral Self Management</td>
<td>2.28</td>
<td>5.57%</td>
<td>10</td>
</tr>
<tr>
<td>V</td>
<td>Social Liberation/Reward</td>
<td>1.53</td>
<td>7.15%</td>
<td>10</td>
</tr>
<tr>
<td>VI</td>
<td>Substance Use/Information Seeking</td>
<td>1.47</td>
<td>4.18%</td>
<td>3</td>
</tr>
<tr>
<td>VII</td>
<td>Substance Use/Emotional Relief</td>
<td>1.26</td>
<td>3.33%</td>
<td>3</td>
</tr>
</tbody>
</table>
change may be supported by the external environment, what Prochaska and DiClemente identified as the Social Liberation scale. It is titled Social Liberation/Reward.

Factor VI contains three items and accounts for 4.18% of the variance. It contains two Substance Use items and one regarding information related to stress. Titled Substance Use/Information Seeking, it appears to be related to Factor VII.

Factor VII contains three items and accounts for 3.33% of the variance. It contains two Substance Use items and one related to emotional reactions to stress. It is titled Substance Use/Emotional Relief. The factors VI and VII appear to relate broadly to the need for emotional relief from stress.

In sum, the factor analytic solutions appear to have identified six underlying constructs involved in coping with stress and making stress related change. These are reevaluation, personal commitment, helping relationships, behavioral self management, social liberation/reward, and emotional relief from stress.

Hypothesis 1c.

The POCQ will demonstrate convergent and discriminant validity.

Campbell and Fiske (1959) proposed that convergent validity can be inferred when agreement exists between measures of the same trait assessed by different instruments. Discriminate validity can be inferred when non-agreement exists between measures of different
traits. Convergent validity can be demonstrated on the basis of significant positive correlations between different measures of the same construct obtained by the same method, while discriminate validity is supported by non-significant correlations between the measure in question and measures of dissimilar traits.

Table 10 presents the correlations of the Processes of Change Questionnaire with those scales that measure similar characteristics - self ratings of coping with two main stressors, self efficacy in managing stress, health beliefs related to stress, contributors to stress management, readiness to make change in order to manage stress better. The job satisfaction measure was used to discriminator. The lack of positive correlation between it and the POCQ supports the divergent validity of the POCQ.

As predicted, the POCQ demonstrated significant positive correlations with contributors to stress management, self efficacy, health beliefs and readiness to make changes. There was no relationship between job satisfaction and the POCQ.

The concurrent validity of the POCQ is further supported by Table 11, the correlation of the twelve original factors and two additional factors from Lazarus' Ways of Coping Checklist with the single item self-rating "How ready are you to make changes in order to manage stress better?" The rating scale used is presented below:

1 2 3 4 5 6 7 8 9 10
Not at all Completely Doing ready ready it now
Table 10

Divergent and Convergent Relationships of the Processes of Change Questionnaire

<table>
<thead>
<tr>
<th>Processes of Change Questionnaire</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Self Efficacy</strong></td>
<td>( r = 0.27 )</td>
</tr>
<tr>
<td></td>
<td>( p &lt; 0.0002 )</td>
</tr>
<tr>
<td><strong>Contributors to Stress Management</strong></td>
<td>( r = 0.44 )</td>
</tr>
<tr>
<td></td>
<td>( p &lt; 0.0001 )</td>
</tr>
<tr>
<td><strong>Rating of Coping with Main Stressor</strong></td>
<td>( r = 0.15 )</td>
</tr>
<tr>
<td></td>
<td>( p &lt; 0.0416 )</td>
</tr>
<tr>
<td><strong>Rating of Coping with Second Stressor</strong></td>
<td>( r = 0.22 )</td>
</tr>
<tr>
<td></td>
<td>( p &lt; 0.0033 )</td>
</tr>
<tr>
<td><strong>Job Satisfaction</strong></td>
<td>( r = -0.05058 )</td>
</tr>
<tr>
<td></td>
<td>( p &lt; 0.5001 )</td>
</tr>
</tbody>
</table>
Table 11
Correlations of Processes of Change Questionnaire Factors with Readiness to Change Item

<table>
<thead>
<tr>
<th>Factor</th>
<th>r</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consciousness Raising</td>
<td>.35</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td>Self-Reevaluation</td>
<td>.19</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>Environmental Reevaluation</td>
<td>.12</td>
<td>&lt; .10</td>
</tr>
<tr>
<td>Self-Liberation</td>
<td>.31</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td>Social Liberation</td>
<td>.27</td>
<td>&lt; .0004</td>
</tr>
<tr>
<td>Counterconditioning</td>
<td>.25</td>
<td>&lt; .0007</td>
</tr>
<tr>
<td>Stimulus Control</td>
<td>.17</td>
<td>&lt; .02</td>
</tr>
<tr>
<td>Contingency Management</td>
<td>.12</td>
<td>&lt; .09</td>
</tr>
<tr>
<td>Helping Relationships</td>
<td>.15</td>
<td>&lt; .04</td>
</tr>
<tr>
<td>Dramatic Relief</td>
<td>.02</td>
<td>&lt; .79</td>
</tr>
<tr>
<td>Interpersonal Control</td>
<td>.22</td>
<td>&lt; .003</td>
</tr>
<tr>
<td>Substance Use</td>
<td>.04</td>
<td>&lt; .57</td>
</tr>
</tbody>
</table>

* Significant correlations
Hypothesis 2

On the basis of responses on the POCQ, groups of subjects can be identified as being in demonstrably different stages in the process of change.

Cluster analysis, in contrast to factor analysis, employs the total variance associated with a variable (or individual) treating it as a unit (Sarle, 1982). Individuals are classified so that there is greater similarity between individuals within groups than between individuals in different groups.

A hierarchical clustering procedure, Ward's method, was used to produce clusters based on individual items of the POCQ and the original factors of the POCQ. This is one of the most widely used procedures, Ward's hierarchical agglomerative method (Blashfield, 1980). Ward's approach initiates the clustering procedure with each individual constituting one cluster. At each step one fewer clusters exist as the individuals are placed into groups on the basis of similarity-dissimilarity between individuals. Cronbach and Gleser's (1953, cited in Arvey & Maxwell, 1979) generalized distance measure (D2) is used. The error variance is analyzed at each iteration to determine the optimal number of clusters that emerge from the initial sample (Arvey & Maxwell, 1979).

The process is continued until all observations are combined into one super-cluster. This procedure produces a tree structure or dendogram that visually represents the relationships of individuals in the hierarchical structure (Davison, 1983).
Unlike other statistical methods for classification, such as discriminant analysis, cluster analysis makes no prior assumptions about important differences within a population. It is a purely empirical method of classification, and as such is primarily an inductive technique (Punj & Stewart, 1983).

While some researchers (e.g., Klastorin, 1983) suggest several methods of statistically testing the cluster formation by, for example, comparing the partition's F statistic with the F distribution generated from all possible partitions, or with the theoretical distribution of maximum F values, most maintain that such tests are theoretically unfounded (Arvey & Maxwell, 1979; E. Smith, personal communication, May 30, 1985). The F statistic is inappropriate because cluster analysis makes the assumption that each cluster is representing a different population. This makes the statistical test of a null hypothesis that there are no differences from an overall population difficult to support. Consequently, the primary test of the cluster partition is the utility of the clusters in predicting the criterion variables.

A key problem with cluster analysis is the possibility of capitalizing on error or meaningless variance. This appears to have occurred in the first cluster analysis solution, the one performed on items of the POCQ. One approach to this problem is to use factor scores as the clustering variables, since they represent only common variance, thereby eliminating a large source of error variance. The
solution from the cluster analysis on factor scores provided adequate groupings of 66 individuals into four groups. A fifth group contained 116 individuals. It appears that this group is not distinctive enough based on the dendogram and that fact that its means fall in the middle of that of the other clusters to warrant consideration as a meaningful cluster.

It should be pointed out that the cubic clustering criterion reported for this partition, although not a completely reliable measure, suggested that this was not a partition that represented distinct populations. That is, the cubic clustering criterion was negative and tended to become increasingly so with each new partition, whereas a positive increase would be a sign of truly distinct groupings (Sall & Sarle, 1982).

However, the outcome that the four similarly sized clusters had differential scores on the criterion measures of change does support the assumption that the clusters do indeed represent different populations. Although C1 (N = 116) was of interest, inclusion of it in the MANOVA's tended to make them significant apparently on the basis of much greater error variance in that group. Consequently, all multivariate analyses of criterion measures that are reported, are those conducted on the four similarly sized groups.

Unrestricted cluster solution. The first solution produced by the cluster analytic technique, was performed on the POCQ items. A total of 68 subjects were assigned to clusters that contained less than 10
subjects. These individuals were effectively lost to further analysis. The largest cluster that was defined contained 74 subjects. The second cluster included 30 individuals, and the third interpretable cluster included 12 subjects.

In order to verify that the three clusters were significantly different on the assignment variable, the differences between them were tested using a Multivariate Analysis of Variance procedure (MANOVA) on items of the POCQ. There were significant differences between clusters on every item but one, demonstrating that reliable differences existed between clusters on the predictor, the POCQ.

To provide an understanding of the ways in which the clusters (groups) of subjects differed from one another and to test the second aspect of Hypothesis 2, the means of each cluster were computed for the twelve original and two added subscales of the POCQ. Comparison of the cluster means for each subscale indicated a stable pattern. That is, cluster 2 was consistently higher on every subscale than Cluster 1, which in turn was higher on every measure than Cluster 3. As this consistent pattern across subscales (processes of change) is contrary to the prediction that individuals within meaningful clusters would demonstrate differential use of the processes of change, these clusters did not appear to support the following hypotheses.

The final aspect of Hypothesis 2 requires that the clusters differ with respect to their pattern of change processes. The
results of several MANOVAs indicated that there were indeed differences between these clusters on three criterion variables. Specifically, the clusters differed on contributors to Stress Management at Time 1 ($p < .02$) and Time 3 ($p < .005$). They were also marginally different on the Weekly Average of Stress Management Activities at Time 2 ($p < .06$) and significant at Time 3 ($p < .003$). Inspection of the means for the clusters on these variables demonstrates the same trend as that seen with the criterion. That is, Cluster 2 endorses items more highly than does Cluster 1 which does so more than Cluster 3.

The only indication that real differences in change processes exist between these clusters is that there was a significant difference between clusters on self-rated change in coping with the primary stressor ($p < .004$), with Cluster 3 demonstrating the largest change. As this cluster had the lowest means on the POCQ scales, this is an interesting result. However, because the level of activity was the fundamental discriminator between the clusters, a second cluster solution was attempted.

Restricted cluster solution. A second cluster solution was undertaken in which the twelve POCQ subscales were used as the clustering variables and the cluster number was restricted to eight. This solution assigned only 66 subjects to meaningful clusters. One cluster was too large to be meaningful, (114 subjects), one contained
2 subjects and two contained one subject each. Analyses were conducted on the four clusters containing a number of subjects that would permit interpretation of their characteristics. These were:
Cluster 2 = 17 subjects, Cluster 3 = 17 subjects, Cluster 4 = 24 subjects and Cluster 6 = 8 subjects.

Hypothesis 2a. Subjects can be grouped by cluster analytic techniques on the basis of their relationship to one another on the POCQ.

Comparison of the cluster means on each of the POCQ subscales demonstrated significant differences between clusters on every subscale (all p's < .0001). Tests for significance on all MANOVA's on clusters have been evaluated on the Type III sum of squares which employs the harmonic mean to control for the unequal sample size of the cells (Goodnight, Sall & Sarle, 1982).

Hypothesis 2b. The identified clusters will evidence patterns of activity of the processes of change that will be similar to the patterns found in the groups of subjects at different stages of change by Prochaska and DiClemente (in press).

The four clusters were discriminated on the basis of the patterns of their responses on the POCQ. The clusters appeared to define groups of people in the Precontemplation stage (n= 17), Contemplation stage (n=8), Action stage (n=17), and Cognitive Action stage (n=24).
The Precontemplators (Cluster 2) had very low levels of activity on each of the scales, similar to the Precontemplators defined in the Prochaska studies. Using other predictors to define this group, they were the least ready to make change, were the least stressed, the least active and used stress management strategies less often than all other groups. Of all the groups, this one was the lowest on the Help Seeking scale from the work by Pearlin and Schooler (1978).

The Contemplators (Cluster 6) were high in their rating of reevaluation activities, with their highest scores being on the scales of Self-reevaluation, Environmental Reevaluation and Consciousness Raising. They were actively using social support, as evidenced by their high score on Helping Relationships. These individuals did not report using self or environmental management strategies to control their stress. Like the Contemplators in the earlier work with smokers, they were thinking about the need for change, but had not made personal life changes to improve the situation. This group was the most stressed at the beginning of the program. The reports of stress management activity from their calendar logs was the lowest of the sample. Interestingly, they reported, as a group, that their primary stressor was lack of time.

The Action group (Cluster 3) had high scores on the scales of Consciousness Raising, Self Reevaluation, Environmental Reevaluation, Self Liberation, Counterconditioning, Helping Relationships, and Interpersonal Systems Control. They also had high scores on the
scales of Stimulus Control and Contingency Management. This group was among the least stressed at the beginning of the program, and was the least stressed by the end. They reported high levels of stress management activity from their calendar logs, and endorsed the use of stress management strategies at the highest level of any group.

The Cognitive Action group (Cluster 4) had high levels of Consciousness Raising, Self Reevaluation, Environmental Reevaluation, and Helping Relationships. They also had scores on the scales of Stimulus Control and Contingency Management that were higher than any other group except that of Action. Like the Contemplators, they had high stress levels, but unlike them, they were more active in their endeavors to manage stressors in their lives. This group may also be characterized as a group under high levels of stress or demand, but that is actively engaged in cognitive attempts to cope. This appears to include a higher use of dramatic relief and substance use than other clusters, and does not appear to be working particularly well as this is one of the most stressed clusters of subjects.

Hypothesis 2c. The identified groups will demonstrate different levels of change activity regarding stress management, reflecting the different stages of change - precontemplation, contemplation, action, and maintenance.

MANOVA's were conducted on the clusters to determine whether there was a difference between groups (clusters) on:
1) Weekly averages of stress management behaviors such as exercise, relaxation, doing what was important, had fun, etc. at Time 2 and Time 3.

2) Attendance at stress management programs at Time 2 and Time 3.

3) Reading about stress management at Time 2 and Time 3.

4) Contributors to stress management including such things as hobbies, vacations, not drinking, not smoking, etc. at Time 1 and 3.

5) Changes in self ratings of coping with the primary and second most difficult stressor.

6) Health habits including sleeping, eating, caffeine and nicotine intake.

The significant MANOVA's were subjected to Duncan's multiple comparison procedure to identify the significantly different means. This provides a demonstration that the various clusters are utilizing each of the processes differentially. No two clusters were consistently associated within the same grouping, which would have suggested that there was little difference between associated groups.

MANOVA's on the criterion measures demonstrate that these four groups of people are engaging in different levels of stress management related activity. Using Wilk's criterion, the overall difference between clusters on Contributors to Stress Management at Time 1 and Time 3 was significant at the p < .0015 level. A Duncan's multiple comparison procedure demonstrated that Cluster 3 (Action) had indicated that various stress management strategies were currently helping them manage stress at Time 1 and Time 3.
significantly more than Cluster 2 (Precontemplators) at Time 1, and more than all other clusters at Time 3.

On the criterion variable, Weekly Average of Stress Management Activities, the Subjects summary of their month's monitoring from the calendar, an overall MANOVA using Wilk's criterion reflected a trend $p < .10$ toward differences between clusters. Cluster 3 (Action) reported the highest level of activities, Cluster 4 (Cognitive Action) coming next, followed by Clusters 6 (Contemplators) and 2 (Precontemplators).

On the criterion variable, Strategies for coping with Stressors 1 and 2 (primary and secondary stressor as identified at Time 1), the overall MANOVA for clusters was not significant. Similarly, there were no differences between clusters on reports of Stress Management programs attended or books read. As these variables were very rarely endorsed by anyone, cluster differences would be extremely unlikely.

Further confirmation of the cluster differences is demonstrated by the significant MANOVA on the readiness to change item ($p < .01$), with clusters 2 and 3 being significantly different from each other but not from 6 and 4. Cluster 3 (Action) was the most ready to make change ($X = 7.35$ on 10 point scale) and Cluster 2 (Precontemplators) least ready ($X = 5.00$).

Differences between clusters on the State Stress measure (Cobb, 1970) at Times 1, 2, and 3 were marginal, (overall $p < .08$ on MANOVA). The univariate statistic for Time 2 Stress was significant
with Cluster 3 (Action) being least stressed and Clusters 4 and 6 (Cognitive Action and Contemplation) being most stressed. This pattern was consistent at all three times with Cluster 2 (Precontemplators) also being less stressed than Cluster 4 and Cluster 6.

Comparison group differences

A non-equivalent comparison group was established once an adequate number of subjects had entered the study as 'experimental subjects.' The purpose of the comparison group was to evaluate the presence of reactive effects that may be associated with the monitoring done by experimental subjects. Consequently, the comparison group completed only the preliminary and final questionnaire. The non-random nature of the comparison group limited the possibility for statistical analysis. The comparison group numbered only fourteen subjects, and was composed only of men. Although the extremely unequal cell sizes prohibited statistical analyses, inspection of the group means was carried out. Differences between group means that were greater than one standard deviation of the experimental mean was accomplished as a rough comparison of the groups. In no case was there evidence of significant differences between the groups on the predictor and criterion measures. This absence of differences was true at both Time 1 and Time 3, supporting the assumption that reactivity of monitoring and attending
to stress management activities did not unduly bias the results. This is consistent with the observation that the reactive effects of self monitoring are brief (Kazdin, 1974).

Consumer Measures Summary

Several questions were administered to identify relevant issues for the delivery of stress management programs. Prime among these was the question of what type of program subjects preferred. The options included "books and audiotapes to use on your own," "self help programs to use on your own," "participation in a self help support group," "participation in an instructor-led course," and "lectures and short programs." The self help programs option was most favored (70% said "yes" they were interested), followed by books & audiotapes (65%), lectures and short programs (51%), instructor-led course (30%) and support group (24%). The support group option was also the most disliked (38% said "no" they would not be interested).

Obstacles to managing stress were also investigated. Subjects were asked to identify their single biggest obstacle from a list of nine options. Excessive time demands was by far the most frequently identified obstacle (39% of the sample). This was followed by "difficult work situations" (17%), "difficult family situations" (12%), "not enough money" (10%), "not enough personal motivation" (8%), and "poor personal habits" (6%). Inflexible work hours, not enough stress management resources, and commuting time each accounted
for less than 2%.

Subjects reported their primary sources of health and stress management information. Twenty-nine percent of the sample said that family, friends and magazines constituted their primary sources of information regarding health and stress. This combination was followed by magazines (24%). Newspapers alone was endorsed by 3% of the sample, but when added to family and friends was endorsed by another 10%, and when added to TV by another 11%. Family and friends alone accounted for another 9% of the sample. Radio and TV alone and in combinations accounted for less than 10% of the sample's primary health information source.
DISCUSSION

The purpose of this study was to extend the application of the Processes of Change Questionnaire to the area of stress management by healthy individuals. The interest underlying this endeavor was in the determination of whether the pattern of relationships of the Stress—POCQ identified the same twelve processes of change hypothesized and empirically defined by Prochaska and DiClemente (1983). Additionally, there was interest in classifying individuals on the basis of their Stress—POCQ responses into meaningful groups. Meaningful classification of groups would be definition of groups that differ on the basis of their level and involvement in making changes in order to cope more effectively with stress.

These purposes translate into the following general theses:

1) The Stress—POCQ contains twelve factors that are consistent with those defined by Prochaska and DiClemente (1983).

2) The factor structure that is defined on this sample will reflect processes of change and coping that are theoretically sound.

3) The sample will be able to be divided into naturally occurring groups on the basis of the Stress POCQ.

4) These groups will make differential use of various stress management techniques and resources.
The Validity of the Processes of Change Questionnaire

The question of validity requires a demonstration that the POCQ accurately assesses what it purports to measure, the processes that constitute progression through change. This suggests that individuals should show changes in the level at which they are using different processes of change, and should move from one stage to another over time. In their work, Prochaska and DiClemente (in press) have identified movement of individuals from one stage of change between the six month measurement intervals. However, they were able to identify this movement in less than a quarter of their subjects during the two—year evaluation period. The movement of subjects from one stage to another in the three months between administrations of the POCQ in the current research did not appear to occur. This assumption is based on the Pearson's correlation between the twelve scales of the POCQ at Time 1 and Time 3. All correlations were statistically significant, with only three having correlation coefficients of less than .61. (See Table 7).

The internal consistency measure (Chronbach's Alpha) of .90 supports the assumption that the POCQ is measuring a cohesive construct. As adequate internal consistency is necessary for a measure to have validity, the POCQ appears to be validly measuring a single construct.

The Twelve Factors of the Stress—Processes of Change Questionnaire

Factor analysis was required to test the initial hypothesis that
the factor structure would be very similar to that defined by Prochaska and DiClemente (1983). The most conservative approach to factor analysis requires a ratio of ten observations (subjects) for every item. This reduces the chance that random variation will influence the development of a scale. As the current research was a replication of the original work, the sample of 372 subjects (rather than a more conservative 600) was accepted as an adequate number of observations. The unrestricted factor solution defined fifteen factors, but only seven of these were considered to be of interest based on the criteria of interpretability, change in eigenvalue from one factor to the next, and variance accounted for by each successive factor (Gorsuch, 1983).

Further analytic solutions were limited to a maximum of seven factors. Interestingly, both uncorrelated (Principal Components Maximum Likelihood) solutions and correlated (Promax oblique solutions based on a Procrustean matrix) produced quite similar results.

The factor analytic solution reported used an oblique Varimax rotation that was restricted to seven factors. The seven factors eliminated the specificity of the twelve defined by Prochaska and DiClemente (1983). However, those that were defined represent the processes theorized by Prochaska (1979; 1982), but do so at a different level of conceptualization than that represented by the twelve scales of the POCQ. The factors defined were, in the order
produced, Reevaluation, Personal Liberation, Helping Relationships, Behavioral Self-Management, Social Liberation/Reward, Substance Use/Information Seeking and Substance Use/Emotional Relief. The last two scales appear to overlap and relate to a general concept of Relief from Stress. The most striking differences of this analysis from that of Prochaska and his colleagues is the summary of the processes of Self-Reevaluation, and Environmental Reevaluation into a general factor of Reevaluation; summary of Self Liberation and Consciousness Raising into a Personal Liberation factor, a summary of Stimulus Control, Counterconditioning and Interpersonal Systems Control into a general factor of Behavioral Self-Management and a summary of Social Liberation and Consciousness Raising into a general factor of Social Liberation/Reward. The original Helping Relationships scale kept the same items and picked up three others, two of which relate directly to social support.

The Underlying Processes of Change

The first four factors defined are quite consistent with predictions of the underlying processes involved in change (Kanfer & Karoly, 1982; Prochaska, 1979; Prochaska & DiClemente, 1982). The primary factor that was defined seems to represent a process of reevaluating one's self and environment with regard to one's ability to not be a stressed person. This process of rethinking one's personal identity - expectations, behaviors and pathologies - and one's actions as they affect the world is a primary and temporally
early process of change identified in the majority of works on behavior change (Burton, 1973; Prochaska, 1979, Prochaska & DiClemente, 1982; Fisch, Weakland & Segal, 1982). It is possible to take exception to the primacy of this variable, maintaining as do the behaviorists that "Personality change follows change in behavior. Since we are what we do, if we want to change what we are we must begin by changing what we do, must undertake a new mode of action." (Wheelis, 1973; p. 101).

The notion that thinking often follows behavior is undoubtedly valid, but the majority of self-change efforts do not occur without the preliminary process of reevaluating one's self and one's world. This is consistent with the need for awareness of a discrepancy between the actual and standard of behavior discussed both by Lewin (1951) and control theorists (Carver & Scheier, 1982).

In the process of therapeutic change, as Kanfer and Phillips (1966) have pointed out, the role of the therapist is to "instigate" changes in behavior that the client would not try on his/her own, to stimulate the client to reevaluate their behavior.

The second factor, Personal Liberation, is also a cognitively focused scale. This is a type of reevaluation, one that is a more emotional process that involves liberating oneself from previously held beliefs. It apparently carries the reevaluation process a step further, allowing the individual to say, in effect, "I really can be different" and to experience that reality emotionally.
Although an emotionally-focused scale, it also involves a learning function. Freedom from previous modes of behavior is achieved by trying out different behaviors. This notion of trialability is fundamental to most models of adoption of new behaviors (Rogers & Shoemaker, 1971; Zaltman & Wallendorf, 1983). Clinically directed change is dependent on this liberation function with the therapist serving as an authority who gives permission for the individual to be different (Fisch, Weakland & Segal, 1982). The self mediated process of change requires the individual to look for and integrate information that supports the likelihood change is possible. One must convince oneself.

Both of the first two factors reflect the importance of feedback to the individual. Although feedback has been conceptualized as a type of self-reinforcement that keeps the change process moving (Kanfer & Phillips, 1970), it appears to support the change process predominately by providing information about how well one is performing in comparison with the standards established (Carver & Scheier, 1982).

Neither self mediated nor therapeutic change is entirely dependent upon the changer alone. The third factor identified by both the orthogonal and oblique rotations was the Helping Relationships. This concept, frequently referred to as social support, has received a great deal of attention in the literature on coping with stress (Billings & Moos, 1981; Gore, 1978; LoRocco, House
& French, 1980). There is much theoretical discussion as to whether social support buffers one from the effect of stress in a fairly direct manner, or whether it reduces the effect of stress only in some less direct way, such as by helping effect change. In either case, it is unquestionably important in order to cope effectively with stress. This factor is actively represented in all the clusters or groups defined, suggesting that it is particularly important for people who tend to seek help (Pearlin & Schooler, 1978).

The relationship of social support to one's ability to make change effectively was investigated by Hirsch (1980) in a group of women who were returning to school and the workplace after spending a number of years working in the home. He found that those who made the required changes most effectively were those who had a solid but broad network of helping relationships. Likewise, one of the key "non-specific" aspects of psychotherapy has long been recognized to be the supportive and caring relationship with the therapist (Bergin & Garfield, 1971).

The fourth process identified through factor analysis was a behavioral self management process. This is an action oriented component in the change effort. It involves rearranging one's external environment, actively doing positively valenced behaviors to prevent oneself from engaging in the unwanted behaviors and providing rewards for conducting one's life in the desired fashion. These behaviors were each represented on a separate scale in the original
POCQ, and the case can be made that they are clearly distinct behaviors. However, the underlying process seems to be a singular entity, that of behavioral self management. This is the focus of the operant psychologists (Cautela, 1970; Kanfer & Karoly, 1982) whose direction on how to make change involves properly arranging the antecedents and consequents that support the desired behavior and by engaging proactively in behaviors that compete with the unwanted behavior.

Although from a treatment and teaching standpoint it is important to break down the components of a strategy, the purpose of understanding the self change process is best supported by focusing on the higher order concept.

The fifth factor seems to be an externally or environmentally focused awareness component. This component involves the liberating and change-supporting possibilities that one observes in the environment. It is not a process that has typically been identified in the change literature. However, it is acknowledged by both the community psychologists and family therapists who recognize the importance of an environment that is accepting and consistent with the new behaviors that the individual is attempting (Haley, 1963; Rappaport, 1979).

The six and seventh factors seem conceptually very related to one another, although the correlation between them is only $r = .23$. Factor six contains only three items, two of which relate to using
drugs to cope with stress and one that relates to seeking information about stress.

The seventh factor also contains two substance use items and contains one item about emotional reactions to stress related problems. Together factors six and seven make up the original Substance Use scale and include several items relating to relief of tension. The substance use items were very infrequently endorsed by subjects, making the valid interpretation of this scale difficult.

In sum, this analysis of the underlying processes involved in the coping and self change process were identified as Reevaluation, Liberation, Helping Relationships, Behavioral Self Management, Social Liberation/Reward and Substance Use/Emotional Relief. While not a replication of the original formulation, it is not inconsistent with it. The six primary scales appear to provide a more parsimonious explanation of the change process. This is important for two reasons. First, parsimony is a requisite of scientific explanation. Second, the simpler the explanation, the easier it is to use in directing other's behavior. The communication process is likely to be more effective if people are required to understand only five or six processes of change. Further, they can identify and influence five processes in order to instigate and maintain changes, whereas twelve is simply too complex.

In contrast, the twelve factor solution reported and used by Prochaska and DiClemente (1983) has the advantage that it specifies
the individual behaviors much more clearly. This may be particularly useful in comparisons of changing different behaviors such as smoking and weight control (Prochaska & DiClemente, 1983).

It is possible that the specific behaviors involved in smoking cessation may be more clearly identified than the behaviors involved in managing stress. While this difference has not substantially influenced the identification of the underlying processes of change, it may account for the overlap between factors. The lack of clarity of the sixth and seventh factors may be related to the fact that substance use in dealing with stress is directly related to relief, whereas the same may not be true in the areas of smoking and weight.

**Natural Groupings of Changers**

The ability to classify individuals on the basis on their stage of or readiness to change is an important challenge in health promotion. Indeed, simply demonstrating that individuals do group on this basis makes a contribution in that it provides a more substantial basis for market segmentation and target marketing in the health arena.

Ward's hierarchical agglomerative method (Blashfield, 1980) was used to cluster subjects on the basis of their responses to the POCQ. Ward's approach initiates the clustering procedure with each individual constituting one cluster. At each step one fewer clusters exist as the individuals are placed into groups on the basis of similarity–dissimilarity between individuals. The process is
continued until all observations are combined into one super-cluster. This procedure produces a tree structure or dendogram that visually represents the relationships of individuals in the hierarchical structure (Davison, 1983).

Unlike other statistical methods for classification, such as discriminant analysis, cluster analysis makes no prior assumptions about important differences within a population. It is a purely empirical method of classification, and as such is primarily an inductive technique (Punj & Stewart, 1983). There is no accepted means of verifying the assumption that each cluster represents a unique group of individuals. The primary test of the cluster partition is the utility of the clusters in predicting the criterion variables.

As discussed in the Results, the initial cluster solution developed from analysis of the original items of the POCQ provided clusters that were unique in their consistent relationship to one another on the twelve scale scores of the POCQ. This result seemed to have grouped individuals on the basis of their tendency to endorse items at a particular level. This apparently reflects a key problem with cluster analysis, the possibility of capitalizing on error or meaningless variance.

The solution used to overcome this problem was to use POCQ factor scores as the clustering variables, since they represent only common variance. This eliminated a large source of error variance.
The solution from the cluster analysis performed on factor scores provided adequate groupings of 66 individuals into four groups. A fifth group contained 116 individuals. It appears that this group is not distinctive enough based on the dendogram and that fact that its means fall in the mid-range of the other clusters to warrant consideration as a meaningful cluster.

However, the outcome that the similarly sized clusters had differential scores on the criterion measures of change does support the assumption that the clusters do indeed represent different populations. While the first cluster (N = 116) was of interest, it could not be included in the MANOVA's because of the large disparity in sample sizes. The greater error variance tends to make all of the analyses significant. Consequently, all multivariate analyses of criterion measures that are reported, are those conducted on the four similarly sized groups.

The Relation of Clusters to Predictor and Criterion Measures

The MANOVA's indicate that for the variable, "readiness to make changes", the clusters were different (p < .01 by Wilk's criterion). This result depended on the fact that Cluster 3 (labelled Action) was significantly higher than Cluster 2 (Precontemplators). Cluster 4 and Cluster 6 fell in between these two and were not significantly different from either.

Similarly, on the measure of stress at the three measurement periods, Cluster 3 (Action) was the least stressed, Cluster 2
Inspection of changes in stress scores reveals that the Action cluster (C3) and Contemplators (C6) made considerably more improvement in their stress scores than any other clusters. This is consistent with the definition of being in the phases of active changing or getting ready to make change.

The self efficacy scores are also consistent with the pattern developing between the clusters. The range of this scale is 10 - 100, with higher scores indicating more self-efficacy (Bandura, 1982). At Time 1 the Action cluster (C3) had significantly higher ($x = 80.94$) self-efficacy than all other clusters. The Precontemplators' self-efficacy was $x = 62.23$. Interestingly, the only group to demonstrate a reduction in self efficacy from Time 1 to Time 3 was the Action cluster ($x = 70.28$ at T3).

This tendency of the Action cluster (C3) to be the most active is maintained in analysis of the criterion variables, Contributors to Stress Management (MANOVA $p < .0015$) and Weekly Average of Stress Management Activities (MANOVA $p < .10$). In both these analyses the Precontemplators (C2) tended to be the least active, with the Cognitive Action cluster (C4) and Contemplators (C6) falling in the middle.

No differences were found on other criterion measures. However, it must be recalled that there was a floor effect on the program
attendance and stress management books read obviating the utility of these measures.

POCQ scale scores for the Clusters indicates that the Action cluster ($N = 17$) was most active in the processes of Consciousness Raising, Self Liberation, Counterconditioning, and Interpersonal Control. This result is a complete replication of what Prochaska and DiClemente (in press) found in those subjects in the Action Stage in coping with Psychic Distress ($N = 129$).

Looking next at the Precontemplation cluster (C2), it was the least active group on the criterion measures, Contributors to Stress Management and Weekly Average Stress Management Activities, and on the readiness to change variable. The MANOVA on differences between all clusters (including C1) on the POCQ scale scores confirms that C2 ($N = 17$) is significantly less active than every other cluster on every process except substance use, social liberation, counterconditioning and dramatic relief. For all of these, it is in the lowest group of clusters, which is significantly different from the majority of clusters. This profile is consistent with that defined as immotives or precontemplators by Prochaska and DiClemente (1982; in press). Individuals in this stage of change are fairly inactive across the board.

The definition of the clusters tending to fall in the midrange is difficult for several reasons. The primary problem is that the profile of the different groups (stages of change) in the original
work (Prochaska and DiClemente, in press) were similar across stages of change, with the primary difference being in the level of activity. A second issue arises from the fact that for the psychic distress population the data on the contemplation and maintenance stages were not usable, providing inadequate comparisons with the present stress sample. Further, the ordering of the various processes is incomplete in all their publications, leaving questions about the relationship of processes to each stage.

These issues notwithstanding, the Cognitive Action and Contemplation clusters (C4) and (C6) can be defined. The individuals in Cognitive Action (N = 24) appear to be involved in processes of liberating themselves from stressful feelings as they are higher than any cluster on the processes of Dramatic Relief, Substance Use and Contingency Management and higher than any cluster except Action (C3) on Self Liberation and Self Reevaluation.

On the predictors, they are highly stressed, more than any other cluster at Time 2. They have low self efficacy scores and rate themselves just above the midpoint on the readiness to change item. They also rate their coping with their two main stressors fairly low.

On the criterion variables, they report engaging fairly actively in behaviors that contribute to stress management. Additionally, they have high scores on the weekly averages of stress management behaviors.
In short, they are taking some action that involves release from stressful feelings, but continue to see themselves as not ready to make behavior change and are not coping particularly well overall. Indeed they are quite highly stressed.

The Contemplation cluster (C6) presents a quite different but no less complex profile. These individuals \((N = 8)\) scored higher than other clusters on Environmental Reevaluation, and higher than all but one cluster on Substance Use and Consciousness Raising. They are at the extremes on Self Reevaluation and Helping Relationships, but quite low on Self and Social Liberation, the behavioral self management strategies and Dramatic Relief. In short, this is the profile of a group that is thinking a lot but not active behaviorally or emotionally.

On the predictors they rate themselves next high, right after the Action cluster, on their readiness to change. They were the most stressed cluster at Time 1 and did make two large improvements in stress. Apparently related to this, they are the most active in using strategies designed to cope with their two main stressors. Their self efficacy rating was low at Time 1 but rose a significant 14 points by Time 3.

On actual behaviors however, they fall short. They are by far the least active in the Weekly Average of Stress Management Activities (taken from monitoring calendar). Further, they report lower scores on Contributors to Stress Management than any other
group except Precontemplators.

The final group C1 ($N = 116$) falls in the midrange on every POCQ scale. They are also indistinguishable on the predictor and criterion measures except for the fact that they made consistently less change in their stress scores and coping ratings than any other group, including the Precontemplators. Interpretation of this cluster is very difficult, in part because of its large size which precludes clear understanding since the variance is great and the midrange means communicate very little.

In sum, it appears that the clustering procedure was able to define unique groups of individuals based on their Stress - POCQ scale scores that related differentially to criterion measures of coping with stress. Specifically, an action group (C3), a contemplation group (C6), an immotive or precontemplation group (C2) and a cognitive action group (C4) were identified and could be interpreted. The large cluster (C1) appears to have no particularly striking characteristics, and indeed is probably a legitimate cluster in the sense that it represents the major two-thirds of the population who simply are not engaged in any active change or remarkable coping process. In control theory terms, this group has not become aware of discrepancies between their higher order standards and that of their actual behaviors. Their involvement in the program can be explained in a variety of ways, from referral by superiors to curiosity, but analyses that support an explanation have
not been performed.

The level of activity of the subjects in health promotion programs being locally offered each month is most striking. This group of over 150 individuals was composed of people with sufficient interest in stress management to enroll in the program and continue to complete forms each month. However, only 5 people reported participating in any program during the three month measurement period. Those who did make changes designed to reduce stress typically read books related to the subject, or increased their level of involvement in stress-reducing activities. Based on this sample, the potential for the success of community programs in reducing health problems appears to be quite low.

Conclusions

The structure and validity of the Processes of Change Questionnaire was generally supported in this research on the processes of coping with stress. The twelve factor scale was reduced to a seven factor scale identifying five fundamental processes of coping and making change. These include Reevaluation, Liberation, Helping Relationships, Behavioral Self Management and Social Liberation/Reward.

The factors of the Stress-POCQ were also found to be useful clustering variables for defining groups of individuals on the basis of their coping and change activity. Although only about one-third
of the sample were classified into meaningful groups, the four clusters that could be defined were fairly consistent with prediction. The most clear-cut groups were those in the Action and Precontemplation stages. Less distinct but still consistent was the group in the stage of Contemplation. The final cluster appeared not to have a parallel in the work of Prochaska and DiClemente (1982; in press), that was a group of poor copers, highly stressed, focused on relief from stressful feelings, but active in their attempts to cognitively deal with their two main stressors.

Future Directions

A theoretical foundation for the self mediated change process will provide a sound basis for testing and intervening in the areas of personal change and health promotion. There are several directions to take in development of this model. One is to use the five-factor model to describe and predict behavior change. A larger portion of the current sample may be described using cluster analysis based on these factor definitions. This analysis may provide clearer descriptions of the use of the processes in each stage of change.

A cross-validation sample will provide a test of the definition of the processes of change as a five process phenomenon. This research would focus on stress management, but must include other behaviors, including those studied by Prochaska and his colleagues.

A more discrete analysis of subjects' evaluations of the positive and negative consequences of stress appears to have value in
defining when entry into an Action stage is likely. A related concept involves the need to integrate this model of the change process into a "meta-theory" of adjustment and coping. The one favored by this author is that of control or cybernetic theory, based on systems theoretical concepts (Carver & Scheier, 1982). Control theory provides a model into which the present research can be integrated. It appears to be particularly useful in describing the decisional and informational components in making change, as well as providing a more probable explanation of the function of feedback in making change than does operant theory. Further, the hierarchical organization it proposes acknowledges the operation of various levels of behavior in a semi-independent fashion. The informational feedback functions described by this model may provide direction for addressing the frequently observed problem of interference by autonomous habit behaviors in attempts to make and maintain change.

The development of a theoretically sound and empirically tested model of personal behavior change will provide a much needed foundation for health promotion. This will enable more effective approaches to our attempts to improve the health and well-being of the community and society.
Appendix A

Recruitment Announcements
STRESS MANAGEMENT RESOURCE PROJECT

Sponsored by
The Department of Psychology
Virginia Tech

Anne W. Riley, R.N., M.S. Coordinator
Richard A. Winett, Ph.D. Project Director

This Project is designed to help individuals and organizations in the New River and Roanoke Valley areas by providing up-to-date information on local stress management activities being offered by various professionals, and the resources (books, audiotapes and media programs) that are locally available.

Monthly from February through June, 1985, participants will receive a listing of programs, lectures and workshops on stress and effective coping that will be offered by professionals, colleges and health organizations throughout the local area during the following month. Additionally, titles of locally available books and audiotapes on stress and relaxation will be provided. The entire project will be conducted via the mails. Participants will learn of many opportunities to attend programs at times convenient to their schedules. Or they may choose to take advantage of the many excellent publications on the subject.

As a way of initiating the Project, several faculty members Department are interested in giving brief presentations on various stress topics during the month of January. Potential topics are numerous, but include such issues as dual career stress, mid-life stress, stress at work, and stress and the single parent.

Our reasons for developing this Project are twofold. First, we hope to provide members of the local communities with resource information that they can use to learn to cope more effectively with the stress and strain of everyday life. Second, we want to find out how people utilize the resource information, what they did to improve their management of stress. Each month when participants receive the resource information they will be asked to complete and return a brief questionnaire about what they did regarding their stress over the past month. Participants will also be asked to complete a questionnaire when they join the Project.

There is no financial cost to the participants whatsoever. All in all, we believe this Project provides a unique opportunity for organizations and individuals to become more aware of ways to improve their efforts to cope with the pressures of modern life, and involves a small amount of effort of their part.

If you have questions or interest in the Project please do not hesitate to contact:
Anne Riley or To leave a message at
Department of Psychology, Psychological Services Center
Virginia Tech, Blacksburg, VA. 24061 call (703) 961-8814
Thank you for your interest in the Stress Management Resource Project. As a participant, you may expect to receive a mailing at the beginning of each month that will provide a listing of upcoming stress management programs and of stress management books and audiotapes. At the beginning of the Project, in February, we would like to have you complete a questionnaire about your stress and to return it to us. Each month after that when you receive the stress management resource information, you will also receive a very brief form we would like you to fill out that explains how you used the resource information in the previous month.

We sincerely hope that you find this to be a beneficial program. If you have any questions, please do not hesitate to contact us either by writing Anne Riley at the Department of Psychology, Virginia Tech, Blacksburg, Va 24061, or by leaving a message with the secretary at the Psychological Services Center, (703) 961-6914.

YES, I'M INTERESTED IN LEARNING OF OPPORTUNITIES TO MANAGE STRESS

__________________________________________________________
Your name                                                 Age
__________________________________________________________
Your complete address

Home phone                                    Business phone

Please return this form by January 30, 1985.
LEARN TO MANAGE STRESS
AT YOUR OWN PACE AND ON
YOUR OWN SCHEDULE

JOIN THE STRESS MANAGEMENT RESOURCE PROJECT
SPONSORED BY
THE DEPARTMENT OF PSYCHOLOGY
VIRGINIA TECH

RECEIVE MONTHLY UPDATES UNTIL JUNE, 1985 ON PROGRAMS,
WORKSHOPS AND LECTURES BEING OFFERED BY PROFESSIONALS IN
THE LOCAL AREA.

EACH MONTH YOU WILL ALSO RECEIVE A LIST OF VARIOUS STRESS
RELATED BOOKS AND TAPES, EACH BRIEFLY DESCRIBED TO HELP YOU
DECIDE HOW HELPFUL IT WOULD BE FOR YOU.

YOU ATTEND THE STRESS RELATED PROGRAMS IF YOU WANT.
THERE IS NO OBLIGATION TO ATTEND ANYTHING. THE WHOLE
PROJECT WILL BE CONDUCTED VIA THE MAIL.

YOU WILL BE ASKED TO COMPLETE BRIEF QUESTIONNAIRES ABOUT
HOW YOU MANAGE STRESS. ALTOGETHER THESE WILL TAKE LESS THAN
AN HOUR OF YOUR TIME.

CUT HERE AND RETURN TO:
ANNE W. RILEY
DEPARTMENT OF PSYCHOLOGY
DERRING HALL

YES, I AM INTERESTED IN PARTICIPATING IN THE STRESS
MANAGEMENT RESOURCE PROJECT!

_________________________  ________________________  ________________________
Name                  Home Phone        Work Phone

CAMPUS ADDRESS

PLEASE RETURN BY FEBRUARY 26TH. IF YOU HAVE QUESTIONS,
PLEASE CALL 961-6914 AND LEAVE A MESSAGE FOR ANNE RILEY,
PROJECT COORDINATOR.
Department of Psychology

January 25, 1985

Dear Friend,

We are very pleased that you are interested in participating in the Stress Management Resource Project being sponsored by the Department of Psychology. Below is a brief explanation of the Project. We hope that you find it to be simple and useful.

Each month from February through June, 1985 — **We will:**

Send you a list of Stress Management Resources in the mail:

- Programs and lectures on stress management that are being presented by professionals in the local area in the upcoming month.
- Brief descriptions of several books and audiotapes related to stress management and relaxation.
- A brief questionnaire about your management of stress.

Each month from February through June, 1985 — **Participants will:**

Return by mail the completed questionnaire.

- The first questionnaire, received in February, takes one-half hour to complete.
- The monthly forms, received in March, April and May, take about five (5) minutes to complete.
- The final questionnaire, received in June, takes about fifteen minutes to complete.

You may, of course, participate in any of the stress management programs being offered each month, read the suggested readings, practice relaxation to an audiotaped guide, develop a stress management support group at work, or any of a number of stress reduction activities of your own choosing.

All in all, participation in the project itself will take less than an hour and cost the price of 5 stamps. And you will have a wealth of information about health and stress management that you can use for years to come.
If you have any questions that I might be able to help you with, please do not hesitate to call me at (703) 961-6914 or 961-5388. Or write me at the Department of Psychology.

As a participant you may expect to receive the first mailing of Stress Management Resource Information in the first week of February. We hope that you find it useful for you and your family, and look forward to having you participate in the Project.

Anne W. Riley, R. N., M.S.
Project Coordinator
Appendix B

Stress Management Resource

Information Requests
Dear Director:

The Department of Psychology at Virginia Tech (VPI & SU) is sponsoring a community project designed to provide residents of the New River and Roanoke Valley regions with information on activities and resources for managing stress and improving coping. The first phase of this project will continue through June 1985.

In order to provide this stress management resource information to the community, we need information from you. Specifically, what stress management related programs will your organization be providing from now through the month of February? Relevant activities include:

- Stress management programs
- Yoga and Exercise programs
- Time management programs
- Health improvement programs
- Relaxation programs
- Parenting skills

Please use the attached request sheet to list the upcoming programs you are planning, along with the relevant cost, location and time information. A self-addressed envelope is provided. In order to include this information in the mailing to the participants, your material must reach us by January 13, 1984.

Your resource information will be delivered on a monthly basis to approximately 200 individuals who have expressed interest in participating in stress management activities.

We will be requesting the same information again in approximately one month for future programs. Our requests for additional program information will only be sent to those organizations that respond to this request by the deadline of January 13, 1985. Therefore, if you may have a future interest in this service complete the form now and return it. If you will not be offering a program in January or February fill in your name and address and return the request form.

If you plan any stress management related events for January or February after returning this request, please do not hesitate to send us the information. We will attempt to include it in the next mailing to participants. We appreciate your contribution of time and effort, and hope that this community project will be mutually beneficial.

Sincerely,

Anne W. Riley, PhN., M.S.
Project Coordinator

Enclosures
REQUEST FOR STRESS MANAGEMENT RESOURCE INFORMATION

Must be received by February 22, '85 to be included in mailing.

Please list any lectures, workshops, etc. on stress and coping that are planned by your organization for the month of MARCH 1985. Include all relevant attendance information, as requested.

Please do not include programs that are strictly clinical in focus, e.g., targeted to individuals with significant stress related problems such as alcohol or drug dependence. However, programs that address similar issues but that are relevant for general audiences may be included, e.g., a lecture on "Relaxing Without a Drink" would be appropriate.

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<th>COST</th>
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THANK YOU

If you would like a copy of the Stress Management Resource List please check here ________.

Your name and address ________________________________.
February 12, 1985

Dear Director:

As you are aware, the Department of Psychology at Virginia Tech (VPI & SU) is sponsoring a community project designed to provide residents of the New River and Roanoke Valley regions with information on activities and resources for managing stress and improving coping. Enclosed is a copy of the Stress Management Resource List sent to the 200 participants currently involved in the Project.

In order to update this stress management resource information for the month of March, we need information from you. Specifically, what stress management related programs will your organization be providing from now through the month of March?

Please use the attached request sheet to list the upcoming programs you are planning, along with the relevant cost, location and time information. A self-addressed envelope is provided. Please return this information within one week. In order to include this information in the mailing to the participants, your material must reach us by February 22, 1985.

We will be requesting the same information again in approximately one month for future programs. You may be interested to know that our initial information suggests interest in programs focusing on stress in the family, coping with old age, and substance use and stress management.

We appreciate your contribution of time and effort, and hope that this community project will be mutually beneficial.

Sincerely,

Anne W. Riley, R.N. M.S.
Project Coordinator

AWR: bem
Enclosures
March 12, 1985

Dear Director:

As you are aware, the Department of Psychology at Virginia Tech (VPI & SU) is sponsoring a community project designed to provide residents of the New River and Roanoke Valley regions with information on activities and resources for managing stress and improving coping. The Project has been very well received by the community. However, as I have mentioned to a number of you on the phone, there have been relatively few stress management activities open to the community at large. We are all aware that a fundamental reason for this situation is that typically the attendance at such activities is small. I will be explaining this to the participants in the April mailing, and encourage them to invite professionals and their organizations to provide lectures and workshops for specific groups that are able to guarantee a moderate number of participants. If you are able and interested in being contacted to provide stress management related activities, please indicate this on the attached Stress Management Resource Request.

The enclosed Stress Management Resource List was sent to the 250 participants currently involved in the Project.

What stress management related programs will your organization be providing from now through the month of JUNE? Please note that we are requesting information on programs through June. If you plan a program after you return this Request, please drop me a note to that effect, and we will include it in the following month's mailing to participants.

Please use the attached Resource Request to list the upcoming programs you are planning, along with the relevant cost, location and time information. A self-addressed envelope is provided. Please return this information within one week. In order to include this information in the mailing to the participants, your material must reach us by March 30, 1985, the first day of Spring.

We will be requesting the same information again in approximately one month for future programs. You may be interested to know that our initial information suggests interest in programs focusing on stress in the family, coping with old age, and substance use and stress management.

We appreciate your contribution of time and effort, and hope that this community project will be mutually beneficial.

Sincerely,

Ann W. Riley, R.N. M.S.
Project Coordinator

AWR: bem
Enclosures
Appendix C

Initial Participant Mailing

Overview

Informed Consent

Stress Management Resource Information

Monitoring Calendar
Dear Participant,

We are very pleased that you have chosen to participate in the Stress Management Resource Project being sponsored by the Department of Psychology. It has been decided that February will be an introductory period. There are no questionnaires to fill out this month. But, please, read on.

Enclosed is your Stress Management Resource Information. We hope that you find it to be of interest. As you will notice, February is a slow month for community programs. The forecast for March is much better. Of course, the stress management books and audiotapes are always available.

Also enclosed are two (2) copies of an Informed Consent form that explains the Project. Please read this, sign one copy and return it to me in the enclosed envelope by 2/20/85. The other copy is for your records. As you will see from the explanation, we have tried to make the research aspect of the Project as simple and effortless as we can while still determining how healthy folks like you manage to deal with stress.

One of the things we will do to make the Project convenient for you is to provide you with a calendar each month that you can use to keep track of what you did to manage stress. You will notice on the (pink) calendar for February, that there are some methods listed at the bottom that people sometimes use to cope with stress. Each of these methods is identified by a letter (a-j). Use the calendar to keep a record of what you do to manage your stress. Use the letters to quickly jot down what you do. Naturally, if you use other methods to manage stress, jot them down too, don't be limited by our categories, there's nothing magic about them. If you use this simple system each day, your record will be much better than if you try to remember what you did at the end of the week or month. You will learn more and so will we. Keep this calendar and use it to fill out some of the questions we'll have for you later. You may even be able to send us the calendar to save you some time. Place the calendar in a noticeable spot in your home (on the refrigerator) or at work (above your work area). Please use it each day.

You can expect to receive the Stress Management Resource Information for March during the last week in February. At that time you will also receive the initial questionnaire.

Till then, good luck with all you do.

Cordially,

Anne W. Riley, R.N., M.S.
Project Coordinator

Enclosures
Self Management of Stress

Informed Consent Form

Purpose of this Project:

I understand that the purpose of this Project is to provide information on stress management activities and resources that are locally available, and to evaluate how this information is used by community residents.

Procedures and measures:

I understand that each month from February through June 1985 that I will receive information on what stress management resources (such as workshops, lectures, books and audiotapes) are locally available. This information will be sent to me through the mail. I further understand that there is no financial cost involved for participation in this Project, other than the cost of four return stamps.

Further, I understand that this resource information is simply a summary of locally available stress management opportunities, books and audiotapes. This listing does not indicate endorsement of any activity or materials included on these lists by the Project Director, the Department of Psychology, or the University.

I understand that at the end of February and the end of April I will receive a questionnaire that I will need to complete and return within a week. Each will take less than thirty (30) minutes. I will receive, complete, and return a brief questionnaire at end of March. I will also be requested to keep track of my stress management activities in order that I can give an accurate reporting of my stress management efforts.

As with many Projects, it is a necessary part of this type of scientific endeavor to get information from a variety of sources. Additionally, it is often preferable to get other family members involved when dealing with stress management concerns. To this end, I understand that my spouse (or, if preferred, another household member) will be briefly contacted by a research assistant on the average of about once a month. The purpose of this brief contact is to gather information on stress management activities in which I have been involved. I understand that this contact will be strictly confidential and will be limited to the topic area specified above.
Participant's obligations, and potential benefits:

I understand that my responsibilities include the completion and return of three questionnaires via the mail. I will also be responsible for keeping track of my stress management activities from February through May.

It is anticipated that by taking advantage of the stress management opportunities that are listed, that I may learn approaches and skills that better enable me to cope with the problems of daily living. However, I do understand that such benefits cannot be guaranteed. Further, I am under no obligation whatsoever to become involved in any stress management activity.

I understand that this Project is not designed to deal with problems of a severe nature. That is, only information will be provided. There is no provision for consultation or therapy.

I understand that as a participant in this Project, any questions I ask will be answered as accurately as possible.

I further understand that all information I share will be held in the strictest of confidence. Reports of this research will be on the basis of group results that do not permit identification of individuals.

I understand that I am free to discontinue my participation in this Project at any time, without any type of prejudice or penalty.

I hereby agree to voluntarily participate in the research Project described above and under the conditions described above.

Printed Name Signature Date

Concerns may be brought to Mr. C. D. Waring, (703) 961-5284
This month of cold and blustery winds, is a slow one for community programs. A few brave souls, apparently unmindful of the weather, are offering some interesting, helpful programs. February is also the worst month for outbreaks of "cabin fever." That makes it an especially good time for catching up on your reading and listening to relaxing sounds. The books listed below are among the "current classics" for those interested in changing the ways they manage stress. The audiotapes are designed to help you learn to relax while listening to the tape in a quiet, comfortable place.

COPING WITH STRESS WHEN YOUR CHILD DOESN'T ACHIEVE - Tuesday, February 19th, 7:30 pm - Fourth Floor Classroom B of Montgomery County Hospital. COST: None.
Mary Ann Hanna, Ph.D., L.P.C. will discuss how parents can cope with the stress that can occur when a youngster fails to achieve academically and who lacks motivation for achievement. TO REGISTER: Call 951-1111, ext. 108.

MANAGING STRESS IN THE FAMILY - Wednesday, February 20th, 7:00-9:00pm - Radford Public Library, 30 1st Street, Radford, Va. COST: $2.00 per family.
Mike Brown and Anne Riley of the Mental Health Services of the New River Valley will present a program for adults and their school age children that provides lighthearted and sensible ideas about reducing unnecessary tension in families. TO REGISTER Call: 639-1640.

EATING FOR A HEALTHY HEART - Tuesday, February 26th, 7:30pm, Fourth Floor Classroom B, Montgomery County Hospital. COST: None.
Jane Burdick, Registered Dietitian, will explain how you can manage stress and help reduce the risk of developing heart disease by eating right. TO REGISTER: Call 951-1111, extension 108.

STRESS MANAGEMENT: I KNOW WHAT TO DO, WHY AIN'T IT WORKING? - Wednesday, February 27th, 7:30-9:30pm. Blacksburg Presbyterian Church, corner of Church and Eakin Streets. COST: None.
and:
Thursday, February 28th, 7:30-9:30pm. Senior Citizens Center, 110 Union Street, Salem, Va. COST: None.
TO REGISTER: Call 639-9321 OR write Mental Health Services, 409 Norwood St., Radford, Va. 24141.
If you're growing skeptical of all this stress management hype, have tried the formulas, but don't see or feel the results, this program is for you. A plain-talk explanation of how and why stress management efforts are often stressful, followed by a troubleshooting discussion of audience concerns. Presented by Mental Health Services of the New River Valley.
Are you dealing with the particular stress of having a loved one affected by chronic disease or of having such a condition yourself?

CLASS FOR DIABETICS AND THEIR FAMILIES - February 7, 7:30pm, Fourth Floor Classroom B, Montgomery County Hospital. COST: None. This is an ongoing program designed to help diabetics and their families cope with diabetes. This month, a pharmacist will discuss medications and their use. TO REGISTER: Call 951-1111 x 108.

If you are an expectant parent, Montgomery County Hospital (951-1111 x108) and several other community hospitals are offering a variety of classes on preparing for parenthood and helping brothers and sisters prepare. Such classes offer good opportunities to prepare yourself and your family for the wonderful but demanding new family member.

An important program coming up in early March, is part of the Series "HELPING FAMILIES COPE" being sponsored jointly by the Mental Health Services of the New River Valley and Montgomery County Hospital. It is called ALZHEIMER'S DISEASE: HELPING FAMILIES COPE. COST: None. TO REGISTER: Call 951-1111 x108.
Benson, Herbert, M.D. *Beyond the Relaxation Response*. Time Books, 1984. Benson, a cardiologist at Harvard, extends the discussion of techniques he described in his 1975 book *The Relaxation Response* to include what he calls the "Faith factor." While not advocating any particular religious or philosophical system, Benson does confirm that faith in oneself or in a higher power when combined with the Relaxation Response, can dramatically improve our ability to cope and reduce such stress problems as back pain, headaches, and hypertension. Much of the book is devoted to a practical guide to incorporating relaxation and the "Faith factor" into everyday life.

Farquhar, John W. *The American Way of Life Need Not be Hazardous to Your Health*. Norton, 1979. A cardiologist, director of the Stanford Heart Disease Prevention Program, Farquhar explains risk factors and offers brilliantly practical techniques to help people modify their behavior. He starts with stress management since skills used here improve a person's ability to change other habits. Provides step by step methods for achieving small victories that add up to healthful living. Includes a guide to further reading.

Friedman, Meyer and Rosenman, Ray H. *Type A Behavior and Your Heart*. Alfred A. Knopf, 1974 or Fawcett Crest (paperback), 1975. This book provides an excellent review of the entire cardiovascular system, how it works and why it fails. The authors offer convincing evidence that particular behavior patterns lead to increased risk of disease, especially heart disease. Type A (coronary prone behavior pattern) and Type B behavior patterns are described, and general suggestions for modifying Type A behavior are offered.

Friedman, Meyer and Ulmer, Diane. *Treating Type A Behavior and Your Heart*. Alfred A Knopf, 1984. This new volume provides updated information based on recent research on the modification of Type A behavior. Findings show that Type A individuals who had survived at least one heart attack could succeed in changing their behavior pattern and thereby reduce the likelihood of recurrence of another heart attack by 50-75%. A practical, do-it-yourself program is provided to help the reader help him/herself.
Sehnert, Keith W. Stress/Unstress - How You Can Control Stress at Home and on the Job. Augsburg, 1981. A pioneer in the self-care movement and the author of How to Be Your Own Doctor-Sometimes, Sehnert provides an easy to read volume which effectively covers both the nature and treatment of stress. Topics include professional burnout, relaxation techniques, nutrition, exercise, and spiritual perspectives. Sehnert's "Five ways to manage stress" is an especially useful section, that translates the results of stress research into a practical prescription.

Audiotapes

"Relaxation Break" produced by Wellness Productions, Cost: $6.95, total. To order: Write Wellness Productions, 339 King George Ave., Roanoke, Va. 24016. The female speaker on this tape "talks you through" several relaxation techniques. Side one is a muscle tension-relaxation exercise that is typically a good way to learn relaxation. Once you have mastered this, you will find that Side two provides restful images of beach scenes and sounds that will help you extend your ability to relax easily and to maintain your relaxed feelings.

"How to Relax" by Patricia Carrington. Cost: $6.95. Available at Walden bookstores. This tape is similar to the one described above and will similarly enable you to learn several relaxation techniques if you practice with it regularly.

"How to manage time and set priorities" Cost: $6.95. Available at Walden bookstores. This tape shows how to save time every day. You will learn to set obtainable goals and objectives, avoid interruptions, reduce paperwork and run effective meetings. Also learn to avoid procrastination and overwork.
Appendix D

Participant Mailings

March

April

May
Dear Participant,

I know you are busy, BUT PLEASE READ THIS NOW. And thanks we're really so glad you've joined us in this Project.

Enclosed you will find your:

- Stress Management Resource Information for March.
- March Calendar (Green of course).
- DATED MATERIAL:
  OpScans with the main questionnaire on them.
  3 x 5 card for indicating your contact person.
  Return envelope (RETURN BY MARCH 5, 1985).

First, let me explain the DATED MATERIAL. This is the main (and longest) questionnaire. Please DO IT NOW (a proven time management technique). To complete the questionnaire doing the following:

1) Get a No. 2 (soft) pencil to fill out the forms.

2) Note your ID number that is marked on the first 2 forms. Fill in the circles on the top right of each of the Op-Scans to indicate your ID number. Write your name on the first form.

3) Now answer ALL of the questions on the front and back of the Op-Scans.
   a. Put your answers on the sheet by darkening the appropriate circle for that number question.
   b. PLEASE NOTE the number of the question you are answering and make sure you put your answer in the right space.
   c. ALSO, there are questions on the back of every page except the last one.
   d. There are a few questions where you should write your answer directly on the OpScan sheet in the blank provided.
   e. Care and handling of Op-Scans:
      Fill in the circles completely. Do not make stray marks on the sheets. Erase completely. Please keep the sheets in the order that you received them. PLEASE, PLEASE DO NOT BEND, STAPLE, FOLD OR OTHERWISE AGGRAVATE THE OP-SCAN FORMS.
4) Fill in the 3 x 5 card with your name and ID number and the name, and work phone and home phone of the person we can contact about your stress management. Please indicate with an asterisk (*) at which phone number he or she would prefer to be contacted. Please rest assured that we will ask simple, nonsensitive questions that are designed only to corroborate your responses.

I know this part of the project does not help much to reduce your stress (just the reverse, if anything). However, it is important not just for science but for yourself and the community. We do appreciate your prompt and careful completion of these forms. Thanks a lot.

When you have completed all of the Op-Scans (with your ID No. on each of them) and the 3 x 5 card, put them in the return envelope and put it in the mail today. AT THE LATEST, RETURN BY March 22, 1985.

Also, please put your work and home phone numbers on the 3 X 5 card.

Cordially,

Anne W. Riley, R.N., M.S.

AWR: bem

Enclosures
March is a month when we're all itching to get out of the house, to urge Spring on. If you've been feeling cooped up, there is no better time than now to start an enjoyable, outdoor exercise program. EXERCISE, you say, that raises my stress level. Not so. You can make it relaxing and fun. If you haven't been very active over the winter months, start with a walking program. There's one in Roanoke, "Walk the Mall for your Heart", being sponsored by the American Heart Association, Lewis Gale hospital and Tanglewood Mall. The enclosed brochure explains it all. But you can also get going on your own. It's important to wear comfortable shoes, and to gently relax your leg muscles before starting. There are many ways to stretch. The main thing to remember when stretching is NOT TO BOUNCE. Besides giving you a chance to get away, reduce your tension and clear your head, walking also burns calories. According to a major university study, walking a mile in 12 minutes burns only 26 calories less than jogging a mile in 8 1/2 minutes. (Walking 12 minutes/mile = 124 calories, jogging 8 1/2 minutes/mile = 150 calories).

Did you know?... The "Washington Post" has recently started publishing a special magazine section every Wednesday called "Health." It's helpful and quite interesting. They have carried a number of articles on various aspects of stress and stress management, and will certainly continue to do so.

PROGRAMS

POSITIVE PULSE - Beginning March 1st the Pulaski County Hospital is taking reservations for an excellent 3 hour program that combines a brief physical assessment with information about what you can do to manage your own stress/health better. The program, run in small groups, will be scheduled to accommodate those who are interested. COST: $10.00. Follow-up groups are also planned as part of the program. TO REGISTER: Call 980-6822 x 235, Community Relations.

EFFECTIVE FAMILY COMMUNICATIONS - Tuesday, March 5, 7:30 pm - Fourth Floor Classroom B of Montgomery County Hospital. COST: None. Mary Ann Hanna, Ph.D., L.P.C. and Issac Van Patten, Ph.D., L.P.C. will discuss how stress in the family setting can be reduced by improving family communication skills. TO REGISTER: Call 951-1111, ext. 108.

JOB BURNOUT: HOW TO COPE - Tuesday, March 19th, 7:30pm Fourth Floor Classroom B of Montgomery County Hospital. COST: None. Issac Van Patten, Ph.D., L.P.C. will discuss ways to reduce stress experienced as a result of burnout on the job. The discussion will be generalized to address all occupational settings and will teach how techniques of stress management are applicable on the job. TO REGISTER: Call 951-1111, ext. 108.
PROFESSIONAL FORUM: DEALING WITH YOUR STRESS WHILE HELPING OTHERS - Thursday, March 28, 11:00am Fourth Floor Classrooms. COST: $2.50 for buffet lunch.

Mary Ann Hanna and Issac Van Patten will discuss how professionals who deal with illness and death can cope with stress. Directed to ministers, social workers, health care workers and other professionals who assist families and individuals during times of stress. TO REGISTER: Call 951-1111, extension 108.

HELPING YOUR CHILD DEAL WITH STRESS - Thursday, March 21st, 7:00-9:00pm. YWCA Meeting room, 507 W. Main St. Salem, Va. COST: None.

and Thursday, March 28th, 7:00-9:00pm. Committee Room, Donaldson Brown Center for Continuing Education, corner College Avenue and Otney streets, Blacksburg, Va. COST: None.

TO REGISTER: Call 639-9321 OR write Mental Health Services, 409 Norwood St., Radford, Va. 24141.

Today even children and teenagers are experiencing a variety of stresses, many of which we did not have to deal with when we were their age. These lecture/discussion sessions will provide a perspective on the nature and impact of these pressures, and will help parents and kids develop ways of creatively handling them. Older children and teens are encouraged to attend, as well as their parents. Anne Riley and Mike Brown of Mental Health Services of the New River Valley will be conducting the sessions.
Proxmire, William Senator. *You Can Do It!* Simon and Schuster, 1973. This book, written by the outspoken Senator from Wisconsin, touts the value of exercise--simple, balanced exercise--and moderation as optimal ways of managing a demanding life. His prescriptions are valuable. He doesn't suggest the elimination of stressful working conditions. On the contrary, he provides a guide to a full and rewarding life that is balanced by not creating unnecessary stress through poor health habits.

Cooper, Kenneth H. *The New Aerobics.* Bantum Books, (Paperback) 1980. Dr. Cooper provides sound explanations and guidelines for developing your own program of aerobic exercise. While his focus is primarily on developing fitness, aerobic exercise is an excellent way of releasing tension and increasing your capacity to deal with the demands of your life. You don't need to be an athlete to get started, but you do need to take a long range view of what you are starting. Adding exercise, even a little, is healthier than going full steam and then stopping abruptly when you find you can't keep up the pace you set for yourself.

Shierman, Gail and Haycock, Christine. *Total Woman's Fitness Guide.* World Publications, 1979. This physician and physiologist have written a good, basic book on developing a balanced fitness routine. It includes all the information you would need to get started, including stretching exercises. A number of other publications listed can provide whatever additional information you may need on developing exercise regimens.

Strobel, Charles F., M.D. *The Quieting Reflex.* Berkeley Books (paperback, $2.95) 1983. This very readable book addresses the problem of unmanaged stress by explaining how, when and why to use a six second relaxation exercise. Although it sounds gimmicky, it is actually a reasonable approach to keeping your stress at an optimal level. The cues and clues to your stress are explained and a program for developing the Quieting Reflex (QR) until it becomes automatic is provided.

Lakein, Alan. *How to Get Control of Your Time and Your Life.* David McKay Company, Incorporated, 1973. This classic book provides an outline of what you need to do to organize your time and life and how to save yourself time for the important things in your life. It is a skill development book, that is, just reading it won't change anything. You need to try some of the suggestions and make changes in how you manage time for it to help.
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- a. Relaxed thoroughly and healthfully for at least one half hour.
- b. Managed a difficult health habit well.
- c. Said "no" to something that I needed to.
- d. Got organized in a major part of my life.
- e. Talked over a personal concern with someone trustworthy.
- f. Exercised at least 20 minutes
- g. Stopped giving myself a hard time about something.
- h. Figured out what was important to me and did it.
- i. Had fun and laughed a lot.
- j. Made a commitment to myself to manage stress better.
Dear Participant,

I hope this finds you doing well, enjoying the energy and enthusiasm that Spring seems to bring. We are doing exceptionally well, thanks in large part to you. Almost without exception, the first questionnaires were returned promptly and completed accurately. We received a number of thoughtful, helpful comments, only one of which related to our grammatical errors. Thanks for your efforts.

We understand that a number of you have attended stress management programs, or have started stress management projects of your own. Good Work. As you will see from the Stress Management Resource Information, April is a month full of opportunities for participating in a range of such activities.

As for the enclosed QUESTIONNAIRE. Again, please do it NOW. You'll need your March calendar, either the green one or your own, in order to answer a number of the questions accurately.

AS BEFORE:

1) Use a soft (No. 2) pencil to fill out the forms.
2) Darken in your ID# on the top right side of the form.
3) Answer all questions on the front & back of both forms.
4) Please, don't assault the Op scans in any way, they're very delicate, as we all know.
5) Please return the completed Op scans in the enclosed envelope by APRIL 8th.

The daffodil yellow calendar is to help you keep a record of how you're doing each week in managing the stresses in your life. Put it in a prominent place and jot down when you do something good for yourself.

Again, thanks for your efforts. We hope that the information and focus on stress management is proving helpful to you.

Cordially,

Anne W. Riley, R.N., M.S.
Project Director
STRESS MANAGEMENT RESOURCE INFORMATION
Community Programs
April, 1985

A number of EXERCISE CLASSES including aerobics, jazz dancing, fitness for men, and for women, back exercises, stretch, muscle conditioning, and exercise through the later years, are being offered by the YMCA Free University in Blacksburg. There are fees ranging from $22.00 - 28.00. Most classes start the week of April 8th and are 7 sessions long. TO REGISTER CALL 951-4432 for information. Registration must be complete by April 4th.

HATA YOGA: One Free University course that relates directly to learning to manage stress better. Starts the week of April 8th. Beginning: Tuesday 5:30 - 6:30. Advanced: Thursday, 5:30 - 6:30. Briarwood Club, Hethwood, Blacksburg. These courses, taught by Kasum Singh, will teach you the art of creating harmony in the body, mind and self. Cost: $18.00. Registration: Through the Free University. Call 951-4432 to get dates of registration. Must register by April 4th.

STRESS MANAGEMENT - April 9, 7:30 p.m. - Medical Foundation of Roanoke Valley in Auditorium. This is in Salem next to Lewis Gale Hospital. Dr. Gerald Roller will discuss stress in the home and on the job, and the importance of managing stress in these aspects of daily life. Strategies for managing stress will be offered. Cost: None. No registration required.

STRESS MANAGEMENT COURSE - Mondays, from April 15 to May 6, 7:30 p.m. to 9:00 p.m. - Roanoke Athletic Club. In this four-week course, you will learn how to recognize sources and early signs of stress and how to effectively deal with it. Cost: $25.00 for members, $35.00 for nonmembers. TO REGISTER: Call (703) 989-5758.

COMING TOGETHER AND BREAKING APART: INTIMACY AND FRAGMENTATION - Saturday, April 20, 10:30 a.m. and 1:30 p.m. - Babcock Auditorium, Hollins College. COST: None. Ruth Frazier and Kathleen Brehony will present this forum for women that addresses the issues of intimacy and fulfillment. While not a stress management program per se, it may be helpful in identifying and clarifying some of the more critical problems in managing life stress.

OUTDOOR EXERCISE: HOW TO START, WHAT TO DO AND WHERE TO GO. - Thursday, April 25 at 7:30pm in first floor conference room of Montgomery County Hospital. COST: None. Bill Herbert, Director of the Cardiac Therapy and Intervention Program at Virginia Tech will discuss preparation and opportunities for exercise and recreation. A great way to start your exercise program. TO REGISTER: Call 951-1111 x 100.
KIDS ON THEIR OWN AT HOME — FOR THE FIRST TIME — Saturday, April 27 at 10:00 a.m. in the first floor Conference room of Montgomery County Hospital. COST: None. This 3-hour program is designed for children ages 8 and older who may be left alone for a period of time each day. Major focus is on home safety and security precautions. An important way to help manage the stress associated with this concern that many working parents have. TO REGISTER: Call 951-1111 x 100.

PARENTING CLASSES — In April, the Montgomery County Hospital is co-sponsoring with Counseling Associates of Southwest Virginia, several programs on parenting concerns such as discipline, demands, family issues, and communications. Jim Garrison, a professional experienced in helping parents with these issues will be the presenter. The classes meet on Tuesdays at 7:30 p.m. Call 951-1111 x100 to register and to find out which sessions will deal with your child’s age group.

WALK THE MALL FOR YOUR HEART — The program being sponsored by the American Heart Association, Lewis Gale Hospital, and Tanglewood Mall continues to be available at Tanglewood Mall. See the enclosed brochure. Cost: None.

POSITIVE PULSE — The Pulaski County Hospital is taking reservations for an excellent 3-hour program that combines a brief physical assessment with information about what you can do to manage your own stress/health better. The program, run in small groups, will be scheduled to accommodate those who express an interest. Cost: $10.00. Follow-up groups are also planned as part of the program. TO REGISTER: Call 980-6822, Ext. 235, Community Relations.

FUN FOR YOUR LIFE — May 4, 10:00 a.m. to 4:00 p.m. — University Mall, Blacksburg. This Mental Health Fair consists of musicians, games, and activities to remind us of the fun things we can do to decrease stress. Cost: None. No registration required.

Dealing with the stress of chronic disease

CLASS FOR DIABETICS AND THEIR FAMILIES — Thursday, April 4, 7:30 p.m., Fourth Floor Classroom B, Montgomery County Hospital. This ongoing program designed to help diabetics and their families cope with diabetes meets the first Thursday of every month. April’s program by Dr. Siegel, will deal with “The Diabetic Foot.” COST: None. TO REGISTER: Call 951-1111, Ext. 100.

DEALING WITH ALZHEIMER’S DISEASE — April 15, 22, and 29, 7:00 p.m. to 8:30 p.m. — Pulaski Community Hospital, Second Floor conference Room. Cost: None. Mike Brown, Judy Willoughby, and Dr. John Knarr will conduct this three session course on the disease, the problems it creates, and the stress experienced by those involved. TO REGISTER: Call 980-6822, Ext. 235, Community Relations.
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- a) Relaxed thoroughly and healthfully for at least ½ hour.
- b) Managed a difficult health habit (eating, sleeping, drinking, etc.) well.
- c) Said "no" to something that I needed to.
- d) Got organized in a major part of my life.
- e) Talked over a personal concern with someone trustworthy.
- f) Exercised at least 20 minutes.
- g) Stopped giving myself a hard time about something.
- h) Figured out what was important to me and did it.

* Stress Management program offered

1) Had fun and laughed a lot.
2) Made a commitment to myself to manage stress well.
April 17, 1985

Dear Participant:

I know you are busy now, but take heart, you're only going to get busier as the month rolls on. Knowing this as we do, PLEASE READ THIS NOW AND COMPLETE AND RETURN THE FORMS BY MAY 3rd. I know that you (and we) are thankful that this is the last questionnaire. Your response thus far has far exceeded our most optimistic expectations both in terms of your promptness and your comments. We welcome any and all thoughts that you have regarding the study/stress/health/who will take the pennant this year.

You will receive the final mailing at the beginning of June. It will include the Stress Management Resource Information and a summary of what we have found over the past several months. There won't be anything for you to do except read.

Enclosed you will find:

- Stress Management Resource Information
- DATED MATERIAL
- Op-scans with the final questionnaire on them.
- Return envelope (RETURN BY MAY 3, 1985).

To complete the dated material do the following:

1) Get a No. 2 (soft) pencil to fill out the Op-scan forms.

2) Your ID number is not your SS#. Your ID number has been filled in on the first form. Please darken in the appropriate circles to complete it on the remaining forms. Please write your name on all forms.

3) Now answer ALL the questions on the front and back of the Op-scans.
   a. Indicate your answers on the Op-scans by darkening the appropriate circle for that question.
   b. PLEASE NOTE THE NUMBER OF THE QUESTION you are answering and make certain you are placing the answer on the correct location.
   c. ALSO, there are questions on the back of every page except
d. We have written in the main stress situations that you described in February. If these have changed, please cross out the old and replace it with your current stress situation(s). If you've a mind to, we would be interested to know how/why things changed. Just jot it on another piece of paper.

I believe that is about all, though I should remind a few of you about the delicacy of the Op-scans, they really lose their effectiveness when they've been folded or chewed. Thank you, most sincerely, for your efforts and timeliness. I continue to hope that this focus on stress management has been of value to you.

Cordially,

Anne W. Riley, R.N., M.S.
Project Coordinator

AWR:bem
As you will see from the listing, there are several opportunities for stress and health related activities in May. It is also the beginning of the vacation season, a time which everyone (hopefully) is anticipating. That is not to say vacations are stress free. They involve changes in one's routine (i.e., demands) to which we must adapt. But they also provide good diversions and allow us to regain our perspective.

Many of you have indicated that work related demands and conflicts are a major source of stress. May's reading list is focused on the topic of managing work stress. These are all helpful volumes for individuals, though a couple are also directed toward managers. One of the realities of job stress is that stressors that exist at work often are best dealt by the work group. Fighting the bureaucracy (or even poor office management) single-handedly is usually not a satisfying - or stress reducing - strategy. (You needed a psychologist to tell you that?! ) Good luck.

Stress Management Programs

LIVING AND WORKING WITH STRESS - 3 weeks, one session per week, Thursdays, 7:30 - 9:00 pm, May 2 - May 16. Dr. John Heil will discuss stress reduction methods to help individuals cope more effectively with the stress of daily living. COST: $35.00 for non-members; $25.00 for Roanoke Athletic Club members. Limit is 15. TO REGISTER: Call 989-5758.

STRESS MANAGEMENT WORKSHOP - May 15, 7:00-9:00pm Pulaski Community Hospital. Mike Brown of Mental Health Services of the NRV will present this workshop designed to inform participants about techniques for recognizing and coping with stress on the job and in the family. COST: None. TO REGISTER: Call 639-9321.

POSITIVE PULSE - The Pulaski Community Hospital is taking reservations for an excellent 3 hour program that combines a brief physical assessment with information about what you can do to manage your own stress/health better. The program, run in small groups, will be scheduled to accommodate those who are interested. COST: $10.00. Follow-up groups are also planned as part of the program. TO REGISTER: Call 980-6822 x 235, Community Relations.

FUN FOR YOUR LIFE - May 4, 10:00 a.m. to 4:00 p.m. - University Mall, Blacksburg. This Mental Health Fair consists of musicians, games, and activities to remind us of the fun things we can do to decrease stress. Cost: None. No registration required.
Adolescence can be a stressful time for families. The following programs may be helpful to parents of teenagers in managing the stress of adolescence. Dr. Jim Garrison, licensed professional counselor, will discuss the following topics at Montgomery County Hospital. COST: None. TO REGISTER: Call 951-1111 ext. 100.

**Discipline**
Thursday, May 9, 7:30, First floor conference room.
The importance of setting limits appropriate to age of the adolescent, including dating, drinking, driving and drugs will be discussed.

**Maximizing Your Child's Self-Esteem**
Thursday, May 16, 7:30pm First Floor Conference Room
The impact of self-esteem on healthy growth and development in adolescence will be discussed.

**Sex and Your Child**
Thursday, May 23, 7:30pm, Room 337, Third Floor
Dr. Garrison will discuss how to deal with your adolescent's sexuality, how to accept and talk about it.

**Leaving Home**
Thursday, May 30, 7:30pm, First floor conference room
How to help your adolescent move into adulthood and survive it as a parent.

**ORGANIZATIONAL STRESS MANAGEMENT** - Sheraton Red Lion Inn in Blacksburg, May 24, 1985 8:30am-1:30pm COST: $35.00. This workshop is targeted toward business managers in the New River Valley who are concerned about the effects of unmanaged work stress on the health and performance of their employees. Sponsored by the Mental Health Association and the Psychological Services Center. TO REGISTER: Call Kathleen Wager at 552-4531 between 9am-12noon. Deadline to register is May 6.
For More Information


Executive Health. Philip Goldberg. Business Week. McGraw Hill, 1978. 262 pp. This useful book, which begins with an example of a stress-free community, describes stress, its causes, and its symptoms. The second part of the book deals with health strategies, giving information on such health topics as heart disease and the scheduling of physicals. The third section is a well-illustrated guide to personal stress interventions, such as exercise and relaxation techniques.


Organizational Stress and Preventive Management. James Quick and Jonathan Quick. McGraw Hill, 1984. 312 pp. This book discusses organizational stress, its causes, and the effect on the individual. Based on this discussion, the authors describe techniques of preventive management, such as organizational methods for modifying work demands and for improving relationships at work. The book also provides individual methods for managing work and personal demands and for relaxation. Highly recommended for managers.

Preventing Work Stress. Rennart Levi. Addison-Wesley, 1981. 143 pp. This book is one of the best available for providing a broad perspective on the problems of work stress. It discusses such topics as the impact of technology, high-risk situations and groups, and improving the work environment and work processes. It is especially targeted toward managers.

Letting Go of Stress. Tape. This four-part tape is an excellent introduction to stress management, deep relaxation, imagery, and meditation. The purpose of the tape is to help the listener recognize tension and stress in his or her body and to teach some effective ways to relax. Cost: $18.95. Order: Call (415) 328-7171 or Write to Box W, Stanford, California 94305.
Appendix E

Initial Measurement Package
Demographics

Note that there are only 16 items on this form. All are answered consecutively.

1) Sex:
   1) female
   2) male

2) Age:
   1) 18–25
   2) 26–35
   3) 36–45
   4) 46–55
   5) over 55

3) Years of education:
   1) through grade school
   2) attended high school but never graduated
   3) graduated from high school
   4) attended undergraduate school or business school but never graduated
   5) graduated from undergraduate school or business school
   6) graduated from graduate school

4) You are currently:
   1) working full-time
   2) working part-time
   3) both working and going to school (please note the average number of hours per week that you work: _____)

5) Years you have been working:
   1) less than 5
   2) 5 – 10
   3) 11 – 15
   4) 16 – 20
   5) more than 20

6) Marital status:
   1) single (never married)
   2) married
   3) divorced or separated
   4) widowed

7) Number of children:
   1) 0
   2) one
   3) two
   4) three
   5) four
   6) five or more
8) How many people live in your household (include yourself, your spouse, children, relatives, etc.):

9) Approximate current family income before taxes (i.e. your income + your spouse's income):

1) less than $12,000 per year
2) $12,000 — $20,000 per year
3) $21,000 — $30,000 per year
4) $31,000 — $40,000 per year
5) $41,000 — $50,000 per year
6) over $50,000 per year

10) Please indicate the type of work you do:

1) Student 2) Semi-skilled 3) Skilled 4) Professional

Consumer Information

11) What is your primary source of information about health and stress management?

1) Family and friends; 2) The newspaper; 3) The radio; 4) TV;
5) Magazines; 6) Both #1 and newspaper; 7) Both #1 and radio;
8) Both #1 and TV 9) Both #1 and magazines; 0) Both TV and newspapers.

In questions 12 - 16 please indicate what types of stress management materials and/or programs you would be most interested in. Use the scale where: 1) yes; 2) no; 3) Maybe.

Would you be most interested in:

12) Books and/or audiotapes that you can use on your own.
13) Self-help stress management program that you do on your own.
14) Participation in a self help stress management support group.
15) Participation in an instructor-led course on stress management.
16) Lectures and short programs on stress management.
25. Rate the frequency with which you have been waking up fresh and rested during the past one month.
   1) Every day; 2) Most every day; 3) Fairly often; 4) Less than half the time; 5) Rarely; 6) None of the time

26. Rate the frequency with which you have been eating regularly spaced, well balanced meals during the past month.
   1) Every day; 2) Most every day; 3) Fairly often; 4) Less than half the time; 5) Rarely; 6) None of the time.

27. How many caffeine drinks (coffee, colas, tea) do you generally drink in a day?
   1) None or almost none; 2) One; 3) Two; 4) Three to four; 5) Five to six; 6) More than six

28. How many cigarettes, pipefuls or cigars do you NOW smoke per day?
   1) None; 2) Fewer than 10 cigarettes or 1 pipeful or 1 cigar; 3) 10-19 cigarettes, or 2-3 pipefuls, or 2-3 cigars; 4) 20-39 cigarettes, 4-5 cigars, 4-5 pipefuls; 5) 40 or more cigarettes, more than 6 cigars or 6 pipefuls.

   Emotional Distress

29. Have you ever felt that you were going to have or were close to having a nervous breakdown? For example, you felt you were completely losing control and couldn't function.
   1) Yes, I feel that I am close to one now; 2) Yes, during the past year; 3) Yes, more than a year ago; 4) No

30. Have you ever had a nervous breakdown?
   1) Yes, during the past year; 2) Yes, more than a year ago; 3) No

31. Have you ever felt so hopeless that you thought seriously of killing yourself?
   1) Yes, I have thought of it in the last month; 2) Yes, within the last year; 3) Yes, more than a year ago; 4) No.

32. Are you currently receiving help with a serious personal emotional problem?
   1) No; 2) Yes, and it is adequate; 3) Yes, but it is not adequate.
Help Seeking
(Pearlin & Schooler, 1978)

Rate on a scale of 1 to 6 where 1 is never and 6 is frequently.

1 2 3 4 5 6
Never Frequently

33. In the past year or so I have asked the advice of relatives about dealing with my level of stress and problems.

34. In the past year or so I have asked the advice of a friend or neighbor about how to deal with my problems and tension.

35. In the past year or so I have gone to seek the help of a Dr., counselor or pastor for help in dealing with my problems.

Job Satisfaction
(LoRocco, House & French, 1980)

Job Satisfaction: Answer the next 4 questions in relation to your current job. If you do not work outside the home, please complete this in terms of the work you do for your household. If you are attending school fulltime, complete with regard to school.

36. Knowing what you know now, if you had to decide all over again whether to take the type of job you now have, what would you decide?
   1) Decide without hesitation to take the same kind of job.
   2) Have second thoughts.
   3) Decide definitely not to take this type of job.

37. If you were free right now to go into any type of job you wanted, what would your choice be?
   1) Take the same type of job as you now have.
   2) Take a different type of job.
   3) Not want to work

38. If a friend of yours told you she/he was interested in working in a job like yours, what would you tell her/him?
   1) Strongly recommend it.
   2) Have doubts about it.
   3) Advise her/him against it.

39. All in all, how satisfied would you say you are with your job?
   1) Very satisfied.
   2) Somewhat satisfied.
   3) Not at all satisfied
Self Efficacy

Answer all of the following questions using the rating scale below from 0 to 10.

Not at all confident                      Very confident
1  2  3  4  5  6  7  8  9  10
Not at all likely                        Very likely

1. Suppose you determined that in order to manage your stress better you needed to say "no" to several requests for your help and your time each week. How confident are you that you could do this in an effective manner on an ongoing basis?

2. Rate how much do you think saying no effectively helps reduce your stress.

3. Suppose you determined that in order to cope more effectively, you needed to increase the number of times you asked others for help and consideration several times each week. Rate how confident you are that you would be able to do this effectively.

4. Rate how much you think asking for help and consideration effectively helps reduce your stress.

5. Suppose you determined that in order to be able to manage your stress better, you needed to improve your health habits, to get your eating, sleeping, exercise and alcohol consumption habits in a balanced state of moderation and eliminate smoking and substance use. How confident are you that you would be able to do this on a regular basis?

6. Rate how much you think having good health habits improves your ability to manage stress.

7. Suppose you determined that in order to manage your stress better you needed to have at least three (3) half-hour periods a week during which you completely relaxed mentally and physically without falling asleep or using drugs. How confident are you that you could do this on a regular basis?

8. Rate how much you think relaxing regularly helps you manage stress better.

9. Suppose you determined that in order to manage stress you needed to stop being so critical of yourself, start appreciating your strengths and stop unfairly comparing yourself to others. Rate how confident you are that you would be able to do this.
10. Rate how much you think viewing yourself positively helps you manage your stress better.

11. Suppose you determined that in order to manage your stress and cope effectively you needed to identify your personal values, prioritize your activities accordingly and eliminate the lowest priority activities from your life. How confident are you that you would be able to do so?

12. Rate how much you think prioritizing according to your values helps reduce your stress.
Health Status

25. Rate your current health status compared to the best it could be.

Poor 1 2 3 4 5 6 Excellent

Chronic Disease Inventory

PLEASE ANSWER QUESTIONS 26–33 USING THIS SCALE: 1) YES 2) NO 3) DON'T KNOW

26. Do you have heart or circulatory disease?
27. Do you have high blood pressure?
28. Do you have ulcers, colitis?
29. Do you have back problems or back pain?
30. Do you have arthritis or other painful muscle/joint ailments?
31. Do you have hearing problems?
32. Do you have migraine headaches?
33. Do you have some other chronic illnesses?
   If your answer to this question is yes, please write the ailment you have ________________.

Health Beliefs

USE THE FOLLOWING SCALE TO ANSWER QUESTIONS 34 – 38.

1 2 3 4 5 6
Not at all Very much

34. How confident are you that you will be able to learn to manage stress better in the next three (3) months?
35. How serious do you consider the consequences, for yourself, of not learning to manage stress better?
36. How vulnerable do you feel you are to developing stress related problems such as ulcers, heart disease, alcohol problems, etc.
37. How valuable do you think stress management skills and information will be for you?
38. How much do obstacles such as rigid working hours, extreme shortages of time or money, etc. keep you from managing stress as well as you would otherwise?

Obstacles to Managing Stress

39. What is your single biggest obstacle to managing stress?
1) excessive demands on time  2) not enough money  3) inflexible work hours  4) difficult work situations  5) difficult family situations  6) long commuting time  7) not enough stress management resources  8) not enough personal motivation  9) poor personal habits  10) other:

Primary Stressors

40. What is your most difficult personal stress situation. Write it here: _______________________________. Rate how well you are currently coping with this stress, using the scale 1-10 on the Op-Scan where 1 = Very poorly, 10 = Very well.

41. What is your second most difficult personal stress situation. Write it here: _______________________________. Rate how well you are currently coping with this stress, using the scale 1-10 on the Op-Scan where 1 = Very poorly, 10 = Very well.

Stress Management Needs

TO ANSWER #42 AND #43, READ THIS FIRST: For the stress situations you identified in #40 and #41, what is the first or main thing you need to do to manage the situation better?

1) Do you need to learn how to do something differently? (You don't know how to manage it now).

2) Do you need more practice at managing it. (You know what to do, but need to practice it more to be effective.)

3) Do you need to find a way to make managing the situation a regular habit? (You are able to do it well whenever you try, but need to make good management a part of your routine.)

42. In order to manage the stress situation you listed in #40, do you need to do 1 or 2 or 3 above? (Choose only one.)

43. In order to manage the stress situation you listed in #42, do you need to do 1 or 2 or 3 above? (Choose only one.)
Readiness for Change

44. When you really think about it, how ready are you to make changes in order to manage stress better?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all ready</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Completely ready</td>
</tr>
<tr>
<td>Doing it now</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

State Stress Measure
(Cobb, 1970)

Here are some descriptions about how people may feel. When you think about yourself and your life both at home and at work, HOW MUCH OF THE TIME DO YOU FEEL THIS WAY. Use the scale below to rate how much you feel this way.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never or a little of the time.</td>
<td>Some of the time.</td>
<td>A good part of the time.</td>
<td>Most of the time.</td>
</tr>
</tbody>
</table>

1. I feel sad.
2. I feel unhappy.
3. I feel good.
4. I feel depressed.
5. I feel blue.
6. I feel cheerful.
7. I feel nervous.
8. I feel jittery.
9. I feel calm.
10. I feel fidgety.
11. I get angry.
12. I get aggravated.
13. I get irritated or annoyed.
Life Events Summary

RATE THE LEVEL OF STRESSFUL EVENTS THAT YOU HAVE HAD TO DEAL WITH IN THE PAST THREE MONTHS.

16. I have not experienced any significant changes or stress:
   1) true  2) false

17. I have experienced (#) of moderately stressful events. For example, you may have changed residence, school, work, hours you keep, recreation or social activities; started a job; had trouble with a boss; your son or daughter left home with your approval.

18. I have experienced (#) of severely stressful events. For example, you may have experienced injury, illness, loss of a job; a forced move; the death of a family member of close friend; divorce or separation; jail term; retirement; marriage; pregnancy; getting assaulted/raped; severe money problems; have had an affair; found out about spouse's affair.

19. Rate the impact you think these events have had on your mental outlook and well-being. Where: 1) No impact. 2) Positive impact. 3) Mild negative impact. 4) Severe negative impact.

Contributors to Stress Management

For questions 25 - .35 use the scale below. IN YOUR JUDGEMENT, HOW MUCH DOES EACH OF THE FOLLOWING CONTRIBUTE TO YOUR CURRENT ABILITY TO MANAGE STRESS?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contributes very little</td>
<td>Contributes a great deal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

25. Vigorous physical activity.
27. Relaxation exercises.
28. Not smoking cigarettes, cigars and pipes.
29. Not drinking too much alcohol.
30. Taking tonics or vitamins.
31. Taking vacations regularly.
32. Limiting your work hours.
33. Spending time on pleasurable activities, hobbies, etc.
34. Setting priorities based on personal values.
35. Having the right mental outlook/values.

Motivation for Control of Health
(Kirscht, 1972)

RATE THE FOLLOWING STATEMENTS ON THE SCALE BELOW:

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completely disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Completely agree</td>
</tr>
</tbody>
</table>

39. I usually just let events take their own course.
40. I really try to make things happen the way I want.
41. Most of the time, I try to control what happens in my life.
42. I work at keeping healthy and fit.
43. I really try to avoid illness.
44. Generally, I don't bother about trying to protect my health.

Processes of Change Questionnaire
(Prochaska & DiClemente, 1982)

Please indicate how frequently you use each of the following procedures in helping yourself overcome stress.

<table>
<thead>
<tr>
<th>1 = Never</th>
<th>2 = Seldom</th>
<th>3 = Occasionally</th>
<th>4 = Often</th>
<th>5 = Repeatedly</th>
</tr>
</thead>
</table>

1. I associate less often with people who add to my stress.
2. I see indications in some public places of others trying to help people cope with stress.
3. I read about people who have successfully changed.
4. I can be open with at least one special person about my stressful experiences.
5. I tell myself I can choose to change or not.
6. I engage in some physical activity when I am beginning to feel stressed.
7. I seek out people who support my changing.
8. I try to understand the historical causes of my stress.
9. I notice that some public places are designed to help reduce stress.

10. I struggle to alter my view of myself as a stressed person.

11. I use will power to keep from getting stressed.

12. I recall information people have personally given me on the benefits of overcoming my stress.

13. I have someone who understands my problems with stress.

14. I am beginning to think that people overcoming stress will make the world a better place.

15. I think about information from articles and advertisements on how to overcome stress.

16. I take some type of medication for my stress.

17. Remembering studies about illnesses caused by stress upsets me.

18. Other people in my daily life try to make me feel good when I overcome my stress.

19. I try to express feelings related to stress.

20. I tell myself I am able to overcome my stress if I want to.

21. I have someone who listens when I need to talk about my stress.

22. When I am becoming stressed, I try to relax myself.

23. I do something nice for myself in return for not giving in to my stress.

24. I try to change personal relationships that are stressful.

1 = Never, 2 = Seldom, 3 = Occasionally, 4 = Often
5 = Repeatedly

25. I leave places where other people are adding to my stress.

26. I tell myself that if I try hard enough I can keep from being stressed.

27. I read books that help me release my stressful feelings.

28. I make commitments not to become stressed.

29. I reward myself when I don't give in to stress.
30. I notice that stressed people are asserting their rights.
31. I take some type of drugs for my stress.
32. I stop to think that my stress is hurting my environment.
33. I can expect to be rewarded by others if I don't act stressed.
34. I keep things around my place of work that remind me not to get stressed.
35. I find society changing in ways that make it easier for stressed people.
36. I get upset when I think about my giving in to my stress.
37. I remove things from my home that remind me of stress.
38. When I am beginning to feel stressed, I think about something else.
39. I am considering the view that my friends and family deserve a stress-free environment in which to live.
40. I do something else instead of worrying when I need to deal with tension.
41. I remove things from my place of work that remind me of stress.
42. I find that doing things is a good substitute for feeling stressed.
43. Dramatic portrayals about stress effect me emotionally.
44. I have someone whom I can count on when I'm having problems with stress.
45. I am rewarded by others if I don't act stressed.
46. I look for information related to stress.
47. I consider the view that stress can be harmful to an interpersonal environment.
48. I consider the fact that being content with myself includes changing my stress.
Processes of Change Questionnaire
(Prochaska and DiClemente, 1982)

1 = Never 4 = Often
2 = Seldom 5 = Repeatedly
3 = Occasionally

Use the scale above to indicate how frequently you use each of the following procedures in helping yourself overcome stress.

49. I encounter social situations designed to reduce the stress of people.

50. I consciously struggle with the issue that being stressed contradicts my view of myself as a caring and responsible person.

51. I put things around my home that remind me not to get stressed.

52. My tendency to get stressed makes me feel disappointed in myself.

53. I am considering the idea that the world would be a better place without my being stressed.

54. I react emotionally to warnings about stress.

55. Warnings about health hazards of stress move me emotionally.

56. I try to understand why I get stressed.

57. I use tranquilizers to relax.

58. I alter my diet in order to feel better.

59. I take a drink of alcohol to feel better.

60. I wish that I could change stressful situations.

61. I wish that I could change the way I feel in stressful situations.

62. I wish that stressful situations would go away or somehow be over with.

63. I daydream or imagine a better time or place than the one I am in when I'm stressed.

64. In stressful situations I hope a miracle will happen.

65. I blame myself for what has happened.

66. I criticize or lecture myself.

67. I realize I bring problems on myself.
Scoring Key for the Processes of Change Questionnaire for Stress (Prochaska & DiClemente, 1983)

<table>
<thead>
<tr>
<th>Process</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Consciousness Raising</td>
<td>3, 8, 12, 15, 27, 46, 56</td>
</tr>
<tr>
<td>II. Self Reevaluation</td>
<td>10, 36, 48, 50, 52</td>
</tr>
<tr>
<td>III. Environmental Reevaluation</td>
<td>14, 32, 39, 47, 53</td>
</tr>
<tr>
<td>IV. Self Liberation</td>
<td>5, 20, 26, 28</td>
</tr>
<tr>
<td>V. Social Liberation</td>
<td>9, 30, 35, 49</td>
</tr>
<tr>
<td>VI. Counterconditioning</td>
<td>6, 22, 38, 40, 42</td>
</tr>
<tr>
<td>VII. Stimulus Control</td>
<td>2, 34, 37, 41, 51</td>
</tr>
<tr>
<td>VIII. Contingency Management</td>
<td>18, 23, 29, 33, 45</td>
</tr>
<tr>
<td>IX. Helping Relationship</td>
<td>4, 13, 21, 44</td>
</tr>
<tr>
<td>X. Dramatic Relief</td>
<td>17, 19, 43, 54, 55</td>
</tr>
<tr>
<td>XI. Interpersonal Control</td>
<td>1, 7, 24, 25</td>
</tr>
<tr>
<td>XII. Substance Use</td>
<td>16, 31, 57, 58, 59</td>
</tr>
</tbody>
</table>

Sum all items in each process to obtain scale score.
Last month you indicated your two major sources of stress. Using the rating scale below, please indicate how much you used each of the approaches listed to reduce the stress you experience from each of these stresses. If you used another approach, please write it in and indicate how much you used it.

1 2 3 4 5 6 7 8 9 10
Did not use this at all
Used this at every opportunity

Your most difficult stress situation was ________________________.
To reduce the strain it causes you, how much did you:

1. Try to think about the situation differently.
2. Tell yourself not to take it so seriously.
3. Take medication or other substances to reduce the impact.
4. Confront the individual(s) involved to get them to change.
5. Avoid the situation or individuals that cause the problem.
6. Wish something would change to make things better.
7. Talk to someone else to relieve the tension or get help.
8. Attempt to actively change the situation, or yourself.
9. Think about what you could do differently to relieve the problem.
10. Imagine how the situation could be improved.
11. Increase some positive activity to prevent this from bothering you.
12. Manage your health and life as well as possible in order to cope.
13. Do some nice things for yourself, just because.
14. Remove some reminder of the stressful situation.
15. Arrange things so that you got a 'payoff' from managing the problem, in addition to the natural satisfaction you felt.

Other approach _________________________.
Rate how much you used it (1 - 10): _____

Other approach _________________________.
Rate how much you used it (1 - 10): _____
Managing Second Most Difficult Stressor
(March)

Your second most difficult stress was _________________________.
To reduce the strain it causes you, how much did you:

16. Try to think about the situation differently.
17. Tell yourself not to take it so seriously.
18. Take medication or other substances to reduce the impact.
19. Confront the individual(s) involved to get them to change.
20. Avoid the situation or individuals that cause the problem.
21. Wish something would change to make things better.
22. Talk to someone else to relieve the tension or get help.
23. Attempt to actively change the situation, or yourself.
24. Think about what you could do differently to relieve the problem.

Continue to rate how much you used each of these approaches to reduce the strain caused by your second most difficult stressor.

25. Imagine how the situation could be improved.
26. Increase some positive activity to prevent this from bothering you.
27. Manage your health & life as well as possible in order to cope.
28. Do some nice things for yourself, just because.
29. Remove some reminder of the stressful situation.
30. Arrange things so that you got a 'payoff' from managing the problem, in addition to the natural satisfaction you felt.

Other approach _________________________.
Rate how much you used it (1 - 10): ______
Other approach _________________________.
Rate how much you used it (1 - 10): ______

Coping
(April)

31. How well are you currently coping with your most difficult stressor? Use a scale where: 1 = Very poorly and 10 = Very well.
32. How well are you currently coping with your second most difficult stressor? Use a scale where: 1 = Very poorly and 10 = Very well.

Stress Measure (T2)
Anxiety, Anger, Depression
(Cobb, 1970)

Here are some descriptions about how people may feel. When you think about yourself and your life both at home and at work, HOW MUCH OF THE TIME DO YOU FEEL THIS WAY. Use the scale below to rate how much you feel this way.

1 2 3 4
Never or a little of the Some of A good part Most of the time.
the time. of the time. the time.

1. I feel sad.
2. I feel unhappy.
3. I feel good.
4. I feel depressed.
5. I feel blue.
6. I feel cheerful.
7. I feel nervous.
8. I feel jittery.
9. I feel calm.
10. I feel fidgety.
11. I get angry.
12. I get aggravated.
13. I get irritated or annoyed.

Stress Management Program Activity

In March, what (if any) stress management activities did you attend? Indicate your answer, using 1 = Yes, I attended, 2 = Didn't attend.

14. Positive Pulse
15. Effective Family Communications


17. Helping your child deal with stress.

18. Managing the stress of modern life.

19. Did you read a book that directly helped you manage stress or get a better perspective on things in March? 1=Yes, 2=No.
   If yes, please list ________________________________

   Current Stress Management Rating

Using the following scale, please answer #20 and #21.

1 = Much better, 2 = Better, 3 = About the same, 4 = Not as well
5 = Worse

20. In general, how are you managing your stress now, compared to February, 1985, (last month)?

21. In general, how are you managing your stress now, compared to last year about this time, (March, 1984)?

   Stress Managing Activities
   Weekly Average - March

Using your March stress management calendar, please indicate the average number of time each week in March that you did the following:

25. Relaxed thoroughly and healthfully for at least 1/2 hour.

26. Managed a difficult health habit (eating, drinking, sleeping, etc.) well.

27. Said "no" to something that you needed to.

28. Got organized in a major part of your life.

29. Talked over a personal concern with someone trustworthy.

30. Exercised at least 20 minutes.

31. Stopped giving yourself a hard time about something.

32. Figured out what was important to you and did it.

33. Had fun and laughed a lot.
34. Made a commitment to yourself to manage stress well.

Changes in Stress Managing Activities
February - March

For each of these please indicate whether your average level of activity for March involved: 1 = A decrease, 2 = no change, or 3 = an increase, from the average level of activity in February.

35. Relaxed thoroughly and healthfully for at least 1/2 hour.

36. Managed a difficult health habit (eating, drinking, sleeping, etc.) well.

37. Said "no" to something that you needed to.

38. Got organized in a major part of your life.

39. Talked over a personal concern with someone trustworthy.

40. Exercised at least 20 minutes.

41. Stopped giving yourself a hard time about something.

42. Figured out what was important to you and did it.

43. Had fun and laughed a lot.

44. Made a commitment to yourself to manage stress well.
Appendix G
Third Questionnaire
In February you indicated your two main stressful situations, which are written below. If either of these have changed, please cross out the one(s) listed and write in whatever has taken its place. Using the rating scale below, please indicate how much you used each of the approaches listed to reduce the stress each causes. If you used another approach, please write it in and indicate how much you used it.

1  2  3  4  5  6  7  8  9  10
Did not use this at all

Managing Most Difficult Stressor
April

Your most difficult stress situation was ________________________.
To reduce the strain it causes you, how much did you:

1. Try to think about the situation differently.
2. Tell yourself not to take it so seriously.
3. Take medication or other substances to reduce the impact.
4. Confront the individual(s) involved to get them to change.
5. Avoid the situation or individuals that cause the problem.
6. Wish something would change to make things better.
7. Talk to someone else to relieve the tension or get help.
8. Attempt to actively change the situation, or yourself.
9. Think about what you could do differently to relieve the problem.
10. Imagine how the situation could be improved.
11. Increase some positive activity to prevent this from bothering you.
12. Manage your health & life as well as possible in order to cope.
13. Do some nice things for yourself, just because.
14. Remove some reminder of the stressful situation.
15. Arrange things so that you got a 'payoff' from managing the problem, in addition to the natural satisfaction you felt.

Other approach ______________________________________

Rate how much you used it (1 — 10): ______

Other approach ______________________________________

Rate how much you used it (1 — 10): ______
Managing Second Most Difficult Stressor

April

Your second most difficult stress was _______________________.
To reduce the strain it causes you, how much did you:

16. Try to think about the situation differently.
17. Tell yourself not to take it so seriously.
18. Take medication or other substances to reduce the impact.
19. Confront the individual(s) involved to get them to change.
20. Avoid the situation or individuals that cause the problem.
21. Wish something would change to make things better.
22. Talk to someone else to relieve the tension or get help.
23. Attempt to actively change the situation, or yourself.
24. Think about what you could do differently to relieve the
   problem.

Continue to rate how much you used each of these approaches to reduce
the strain caused by your second most difficult stressor.

25. Imagine how the situation could be improved.
26. Increase some positive activity to prevent this from bothering
   you.
27. Manage your health & life as well as possible in order to cope.
28. Do some nice things for yourself, just because.
29. Remove some reminder of the stressful situation.
30. Arrange things so that you got a 'payoff' from managing the
   problem, in addition to the natural satisfaction you felt.

Other approach _______________________
Rate how much you used it (1 - 10): _____

Other approach _______________________
Rate how much you used it (1 - 10): _____

Coping Rating

31. How well are you currently coping with your most difficult stressor?
   Use a scale where: 1 = Very poorly and 10 = Very well.

32. How well are you currently coping with your second most difficult
    stressor? Use a scale where: 1 = Very poorly and 10 = Very well.
Stress Management Needs

To answer #33 and #34 READ THIS FIRST: For your stress situations identified on the front of this form, what is now the main thing that you need to do to manage each stress situation better?

1) Do you need to learn how to do something differently? (You don't know how to manage it now.)

2) Do you need more practice at managing it? (You know what to do, but need to practice to be more effective.)

3) Do you need to find a way to make managing the situation a regular habit? (You are able to do it well whenever you try, but need to make good management a part of your routine.)

33. In order to manage the first stress situation listed on the front, do you need to do 1 or 2 or 3? (Choose only one.)

34. In order to manage the second stress situation listed on the front, do you need to do 1 or 2 or 3? (Choose only one.)

Stress Management Activities
Weekly Average - April

Using your April stress management calendar, please indicate the average # of times each week in April that you did the following:

35. Relaxed thoroughly & healthfully for at least 1/2 hour.
36. Managed a difficult health habit well. (eating, etc.)
37. Said "no" to something you needed to.
38. Got organized in a major part of your life.
39. Talked over a personal concern with someone.
40. Stopped giving yourself a hard time.
41. Figured out what was important and did it.
42. Had fun and laughed a lot.
43. Made a commitment to yourself to manage stress well.
Stress Measure Time 3
Anxiety, Anger, Depression
(Cobb, 1970)

Here are some descriptions about how people may feel. When you think about yourself and your life both at home and at work, HOW MUCH OF THE TIME DO YOU FEEL THIS WAY. Use the scale below to rate how much you feel this way.

<table>
<thead>
<tr>
<th></th>
<th>Never or a little of the time.</th>
<th>Some of the time.</th>
<th>A good part of the time.</th>
<th>Most of the time.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I feel sad.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>I feel unhappy.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>I feel good.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>I feel depressed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>I feel blue.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>I feel cheerful.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>I feel nervous.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>I feel jittery.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>I feel calm.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>I feel fidgety.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>I get angry.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>I get aggravated.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>I get irritated or annoyed.</td>
<td></td>
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<td></td>
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</tbody>
</table>

Life Events Summary

16. I have experienced some significant changes in stress in the past 3 months. If the answer is yes, indicate the number in #17 & 18.

1) Yes  2) No
17. I have experienced _____ (#) of moderately stressful events.) For example, you may have changed residence, school, work, hours you keep, recreation or social activities; started a job; had trouble with a boss; your son or daughter left home with your approval.

18. I have experienced _____ (#) of severely stressful events.) For example, you may have experienced injury, illness, loss of a job; a forced move; the death of a family member of close friend; divorce or separation; jail term; retirement; marriage; pregnancy; getting assaulted/raped; severe money problems; have had an affair; found out about spouse's affair.

19. Rate the impact you think these events have had on your mental outlook and well-being. Where: 1) No impact. 2) Positive impact. 3) Mild negative impact. 4) Severe negative impact.

Contributors to Stress Management

For questions 25 - 35 use the scale below. IN YOUR JUDGEMENT, HOW MUCH DOES EACH OF THE FOLLOWING CONTRIBUTE TO YOUR CURRENT ABILITY TO MANAGE STRESS?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contributions</td>
<td>very little</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>

| 25. Vigorous physical activity. |
| 27. Relaxation exercises. |
| 28. Not smoking cigarettes, cigars and pipes. |
| 29. Not drinking too much alcohol. |
| 30. Taking tonics or vitamins. |
| 31. Taking vacations regularly. |
| 32. Limiting your work hours. |
| 33. Spending time on pleasurable activities, hobbies, etc. |
| 34. Setting priorities based on personal values. |
| 35. Having the right mental outlook/values. |
Stress Management Program Activity

In April, what (if any) stress management activities did you attend? Indicate your answer, using 1 = Yes, I attended, 2 = Didn't.

36. Hatha Yoga
37. Stress management lecture
38. Stress management course
39. Coming together & breaking apart
40. Mental relaxation course
41. Outdoor exercise class
42. Positive Pulse
43. Did you read a book that directly helped you manage stress or get a better perspective on things in April? 1 = Yes, 2 = No.

If yes, please list: ________________________________

Current Stress Management Rating

44. In general, how are you managing your stress now, compared to March, 1985 (last month)? 1 = Much better, 2 = Better, 3 = About the same, 4 = Not as well, 5 = Worse.
Self Efficacy
Time 3

Answer all of the following questions using the rating scale below from 0 to 10.

Not at all confident 1 2 3 4 5 6 7 8 9 10
Very confident

Not at all likely
Very likely

1. Suppose you determined that in order to manage your stress better you needed to say "no" to several requests for your help and your time each week. How confident are you that you could do this in an effective manner on an ongoing basis?

2. Rate how much do you think saying no effectively helps reduce your stress.

3. Suppose you determined that in order to cope more effectively, you needed to increase the number of times you asked others for help and consideration several times each week. Rate how confident you are that you would be able to do this effectively.

4. Rate how much you think asking for help and consideration effectively helps reduce your stress.

5. Suppose you determined that in order to be able to manage your stress better, you needed to improve your health habits, to get your eating, sleeping, exercise and alcohol consumption habits in a balanced state of moderation and eliminate smoking and substance use. How confident are you that you would be able to do this on a regular basis?

6. Rate how much you think having good health habits improves your ability to manage stress.

7. Suppose you determined that in order to manage your stress better you needed to have at least three (3) half-hour periods a week during which you completely relaxed mentally and physically without falling asleep or using drugs. How confident are you that you could do this on a regular basis?

8. Rate how much you think relaxing regularly helps you manage stress better.
9. Suppose you determined that in order to manage stress you needed to stop being so critical of yourself, start appreciating your strengths and stop unfairly comparing yourself to others. Rate how confident you are that you would be able to do this.

10. Rate how much you think viewing yourself positively helps you manage your stress better.

11. Suppose you determined that in order to manage your stress and cope effectively you needed to identify your personal values, prioritize your activities accordingly and eliminate the lowest priority activities from your life. How confident are you that you would be able to do so?

12. Rate how much you think prioritizing according to your values helps reduce your stress.
Health Habits

25. Rate the frequency with which you have been waking up fresh and rested during the past one month.
   1) Every day;  2) Most every day;  3) Fairly often;
   4) Less than half the time;  5) Rarely;  6) None of the time.

26. Rate the frequency with which you have been eating regularly spaced, well balanced meals during the past month.
   1) Every day;  2) Most every day;  3) Fairly often;
   4) Less than half the time;  5) Rarely;  6) None of the time.

27. How many caffeine drinks (coffee, colas, tea) do you generally drink in a day?
   1) none or almost none;  2) One;  3) Two;  4) Three to four;  5) Five to six;  6) More than six.

28. How many cigarettes, pipefuls or cigars do you NOW smoke per day?
   1) None;  2) Fewer than 10 cigarettes or 1 pipeful or 1 cigar.
   3) 10-19 cigarettes, or 2-3 pipefuls, or 2-3 cigars.
   4) 20-39 cigarettes, 4-5 cigars, 4-5 pipefuls.
   5) 40 or more cigarettes, more than 6 cigars or 6 pipefuls.

Health Beliefs

USE THE FOLLOWING SCALE TO ANSWER QUESTIONS 29 - 35.

1  2  3  4  5  6
Not at all Very much

29. How much do you need to make changes in order to manage your stress better?

30. How serious do you consider the consequences, for yourself, of not learning to manage stress better?

31. How vulnerable to you feel you are to developing stress related problems such as ulcers, heart disease, alcohol problems, etc.?

32. How valuable do you think stress management skills and information will be for you?

33. How much do obstacles such as rigid working hours, extreme shortages of time or money, etc. keep you from managing stress as well as you would otherwise?
Obstacles to Managing Stress

34. What is your single biggest obstacle to managing stress?
   1) excessive demands on time   2) not enough money
   3) inflexible work hours   4) difficult work situations
   5) difficult family situations   6) long commuting time
   7) not enough stress management resources   8) not enough personal motivation
   9) poor personal habits
   10) other: __________________________

   Inevitable Consequence

35. How much would you say your stress response is an inevitable, natural consequence of your life situations?

Job Satisfaction
(LoRocco, House & French, 1980)

Job Satisfaction: Answer the next 4 questions in relation to your current job. If you do not work outside the home, please complete this in terms of the work you do for your household. If you are attending school fulltime, complete with regard to school.

36. Knowing what you know now, if you had to decide all over again whether to take the type of job you now have, what would you decide?
   1) Decide without hesitation to take the same kind of job.
   2) Have second thoughts.
   3) Decide definitely not to take this type of job.

37. If you were free right now to go into any type of job you wanted, what would your choice be?
   1) Take the same type of job as you now have.
   2) Take a different type of job.
   3) Not want to work

38. If a friend of yours told you she/he was interested in working in a job like yours, what would you tell her/him?
   1) Strongly recommend it.
   2) Have doubts about it.
   3) Advise her/him against it.

39. All in all, how satisfied would you say you are with your job?
   1) Very satisfied.
   2) Somewhat satisfied.
   3) Not at all satisfied
Processes of Change Questionnaire
Prochaska & DiClemente (1982)

Please indicate how frequently you use each of the following to help overcome your main stress.

1 = Never        4 = Often
2 = Seldom       5 = Repeatedly
3 = Occasionally

1. I associate less often with people who add to my stress.
2. I see indications in some public places of others trying to help people cope with stress.
3. I read about people who have successfully changed.
4. I can be open with at least one special person about my stressful experiences.
5. I tell myself I can choose to change or not.
6. I engage in some physical activity when I am beginning to feel stressed.
7. I seek out people who support my changing.
8. I try to understand the historical causes my stress.
9. I notice that some public places are designed to help reduce stress.
10. I struggle to alter my view of myself as a stressed person.
11. I use will power to keep from getting stressed.
12. I recall information people have personally given me on the benefits of overcoming my stress.
13. I have someone who understands my problems with stress.
14. I am beginning to think that people overcoming stress will make the world a better place.
15. I think about information from articles and advertisements on how to overcome stress.
16. I take some type of medication for my stress.
17. Remembering studies about illnesses caused by stress upsets me.
18. Other people in my daily life try to make me feel good when I overcome my stress.
1 = Never, 2 = Seldom, 3 = Occasionally, 4 = Often, 5 = Repeatedly

19. I try to express feelings related to stress.
20. I tell myself I am able to overcome my stress if I want to.
21. I have someone who listens when I need to talk about my stress.
22. When I am becoming stressed, I try to relax myself.
23. I do something nice for myself in return for not giving in to my stress.
24. I try to change personal relationships that are stressful.
25. I leave places where other people are adding to my stress.
26. I tell myself that if I try hard enough I can keep from being stressed.
27. I read books that help me release my stressful feelings.
28. I make commitments not to become stressed.
29. I reward myself when I don't give in to stress.
30. I notice that stressed people are asserting their rights.
31. I take some type of drugs my stress.
32. I stop to think that my stress is hurting my environment.
33. I can expect to be rewarded by others if I don't act stressed.
34. I keep things around my place of work that remind me not to get stressed.
35. I find society changing in ways that make it easier for stressed people.
36. I get upset when I think about my giving in to my stress.
37. I remove things from my home that remind me of stress.
38. When I am beginning to feel stressed, I think about something else.
39. I am considering the view that my friends and family deserve a stress-free environment in which to live.
40. I do something else instead of worrying when I need to deal with tension.
41. I remove things from my place of work that remind me of stress.
42. I find that doing things is a good substitute for feeling stressed.

43. Dramatic portrayals about stress affect me emotionally.

44. I have someone whom I can count on when I'm having problems with stress.

45. I am rewarded by others if I don't act stressed.

46. I look for information related to stress.

47. I consider the view that stress can be harmful to an interpersonal environment.

48. I consider the fact that being content with myself includes changing my stress.

49. I encounter social situations designed to reduce the stress of people.

50. I consciously struggle with the issue that being stressed contradicts my view of myself as a caring and responsible person.

51. I put things around my home that remind me not to get stressed.

52. My tendency to get stressed makes me feel disappointed in myself.

53. I am considering the idea that the world would be a better place without my being stressed.

54. I react emotionally to warnings about stress.

55. Warnings about health hazards of stress move me emotionally.

56. I try to understand why I get stressed.

57. I use tranquilizers to relax.

58. I alter my diet in order to feel better.

59. I take a drink of alcohol to feel better.

60. I wish that I could change stressful situations.

61. I wish that I could change the way I feel in stressful situations.
I wish that stressful situations would go away or somehow be over with.

I day dream or imagine a better time or place than the one I am in when I'm stressed.

In stressful situations I wait to see what will happen.

In stressful situations I hope a miracle will happen.

I blame myself for what has happened.

I criticize or lecture myself.

I realize I bring problems on myself.
Scoring Key for the Processes of Change Questionnaire for Stress
(Prochaska & DiClemente, 1983)

<table>
<thead>
<tr>
<th>Process</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Consciousness Raising</td>
<td>3, 8, 12, 15, 27, 46, 56</td>
</tr>
<tr>
<td>II. Self Reevaluation</td>
<td>10, 36, 48, 50, 52</td>
</tr>
<tr>
<td>III. Environmental Reevaluation</td>
<td>14, 32, 39, 47, 53</td>
</tr>
<tr>
<td>IV. Self Liberation</td>
<td>5, 20, 26, 28</td>
</tr>
<tr>
<td>V. Social Liberation</td>
<td>9, 30, 35, 49</td>
</tr>
<tr>
<td>VI. Counterconditioning</td>
<td>6, 22, 38, 40, 42</td>
</tr>
<tr>
<td>VII. Stimulus Control</td>
<td>2, 34, 37, 41, 51</td>
</tr>
<tr>
<td>VIII. Contingency Management</td>
<td>18, 23, 29, 33, 45</td>
</tr>
<tr>
<td>IX. Helping Relationship</td>
<td>4, 13, 21, 44</td>
</tr>
<tr>
<td>X. Dramatic Relief</td>
<td>17, 19, 43, 54, 55</td>
</tr>
<tr>
<td>XI. Interpersonal Control</td>
<td>1, 7, 24, 25</td>
</tr>
<tr>
<td>XII. Substance Use</td>
<td>16, 31, 57, 58, 59</td>
</tr>
</tbody>
</table>

Sum all items in each process to obtain scale score.
References


Roanoke Valley Council of Community Services (April, 1985). Working to Improve Life and Living Conference. Roanoke, VA.


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THE PROCESSES OF SELF-CHANGE
IN COPING WITH STRESS

by

Anne Werber Riles
(Abstract)

The development of optimal stress management interventions is dependent on a clear understanding of the processes and stages of change people experience when undertaking changes in health habits. This study was designed to investigate the processes and stages of change that 180 adult volunteers employed in their efforts to change stress-related health behaviors. The reliability, validity and factor structure of the Processes of Change Questionnaire (POCQ) (Procyaska & DiClemente, 1983) were evaluated to determine the utility of this instrument in describing the processes of change used in stress management. Measures of subject preference for program format and stress management information were obtained to define optimal intervention modes. Subjects completed self-reports of stress levels and involvement in stress management activities each month for three months. They completed the POCQ in the first and third month. The reliability of the measures was determined via spouse or friend report. The reliability for overt activities was .82, and for stress ratings was .77. Internal reliability of the POCQ was .90, and above .80 for all other measures employed in the analyses.

The factor structure of the POCQ was compared with the twelve scales identified in the original research. Seven factors, or processes of change, were found in all factor analytic solutions (n=372). Seven factors were derived from an oblique, principal components solution (Varimax): Self and Environmental Reevaluation, Personal
Liberation, Helping Relationships, Behavioral Self-Management, Social Liberation/Reward, Substance Use/Information Seeking, and Substance Use/Emotional Relief. These factors included 58 of the original 60 items and accounted for 39.7% of the variance.

Hierarchical cluster analysis (Ward's method) was used to determine the groups of individuals employing similar configurations of the processes of change. Five distinct groups were identified. Four represented stages in behavior change, Precontemplation, Contemplation, Cognitive Action and Action. A fifth group, the largest one, was not changing their stress-related behaviors. The four groups of changers were distinguishable on the basis of their markedly different levels of stress, distinct profiles of change processes and different levels of stress management activities.

The program preferences and sources of stress management information are reported and discussed in terms of optimal stress interventions. The effectiveness of several methods of program recruitment are also discussed in this context.