ACADEMIC SKILL TRAINING:

A MULTI-MODAL APPROACH

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ABSTRACT

The study investigated the effect of (a) group counselling, (b) self-modification strategies, (c) study skills training, and (d) reading training, on study behavior and academic achievement.

A pretest-posttest control group design was used in which 133 male and female first year college students were assigned at random to six treatment conditions: (a) no-treatment control (NTC), (b) reading training (ENG), (c) reading + counselling + cognitive self-modification (ENG+CLG+CM), (d) reading + counselling + behavioral self-modification (ENG+CLG+BM), (e) reading + academic skill training + cognitive self-modification (ENG+AST+CM), (f) reading + academic skill training + behavioral self-modification (ENG+AST+BM).

Dependent variables included (a) final grade average (FGA), (b) the DA and WM scales of the Survey of Study Habits and Attitudes, and (c) the Diagnostic Reading Test (RE).

Only the groups receiving CM were superior to the NTC group on FGA. The ENG+CLG+CM group was superior to all but the ENG+AST+CM group on the set of dependent variables, and to all but the ENG+AST+BM group on successful persistence in college over four semesters.

ABSTRAIT

La présent étude a examiné les effets de (a) l'orientation en groupe, (b) l'auto-modification, (c) l'entraînement à des habiletés d'apprentissage, et (d) l'entraînement à la lecture, face aux comportements vis-à-vis l'étude et la réussite académique.

Les sujets au nombre de 133 sont tous des jeunes gens et filles de première année collègiale qui furent divisés aléatoirement en six groupes: (a) groupe contrôle sans traitement (NTC), (b) groupe d'entraînement à la lecture (ENG), groupe de lecture, d'orientation, et auto-modification cognitive (ENG+CLG+CM), (d) groupe de lecture, d'orientation, et auto-modification behaviorale (ENG+CLG+BM), (e) groupe de lecture, entraînement aux habiletés académiques, et auto-modification cognitive,(ENG+AST+CM), (f) groupe de lecture, entraînement aux habiletées académiques, et auto-modification behaviorale (ENG+AST+BM).

La moyenne des notes finales, les échelles DA et WM

du "Survey of Study Habits and Attitudes" et le "Diagnostic Reading Test" ont constitué les variables indépendantes.

Seules les groupes avec auto-modification cognitive ont eu un score moyen final plus élevé que le groupe contrôle sans traitement. Le groupe ENG+CLG+CM a eu des résultats meilleures que tous les autres groupes à l'exception du groupe ENG+AST+CM sur le set des variables dépendantes. Le groupe ENG+CLG+CM a demontré plus de persistance avec succès dans le collège que tous les autres groupes à l'exception du groupe ENG+AST+BM pendant quatre semestres.

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CHAPTER I

Introduction

While the decline in the college age population has, in recent years, been reducing the number of potential college students throughout North America, an increasingly large portion of this population has been entering post secondary education institutions. The net result for the colleges and universities has been relatively stable enrollment, but with an increasingly large proportion of poorly qualified students. While it seems probable that some of these students simply lack the ability to achieve success in college programs, it is also apparent that many are either lacking in the various skills required for academic success, or have difficulty in disciplining themselves to use their skills efficiently. It is of great importance that students who are capable of academic success be provided with the opportunity to (a) acquire academic skills - i.e. reading skills, study skills, writing skills, and examination writing skills - and (b) acquire training in the self-regulation

of behavior, expecially study behavior, so that they may put their skills to work. If such opportunities are not provided, many of these skill-deficient students will fail or drop out, probably adversely affecting their career opportunities, and many will probably experience personal problems related to academic failure.

The importance of this study is the contribution to the development of an efficient and comprehensive program for skill-deficient students.

Most programs reported in the literature that are intended to ameliorate problems of academic deficiency by using training in reading, study-skill training or counselling as treatment procedures, produce some gains (Entwhistle, 1960; Bednar & Weinberg, 1970). The majority of these studies report only the manipulation of a single treatment procedure; however, the more successful programs reported describe some combination of treatment procedures (Bednar & Weinberg, 1970). A review of the literature on behavior modification of academic behaviors such as reading and studying reveals a similar situation. Most studies report statistically significant changes in target behaviors, but few report changes large enough to be of practical importance. It seems appropriate at this time to explore the

effects of various combinations of the treatment procedures that have shown some promise in order to determine what additive or interactive effects exist.

Lazarus (1976) provides a model for predicting which combinations of treatment procedures will produce the most gain by hypothesizing that modification of complex human behavior requires a "multi-modal" approach to treatment. He hypothesizes that treatment is more likely to be effective when it includes procedures that attempt to alter behavior by deliberately invoking all, rather than only some, of the following seven modalities: behavior, affect, sensation, imagery, cognition, interpersonal relations, and biology. According to Lazarus (1976), these modalities represent "areas of being" of the person being treated, and effective modification of complex human behavior requires that changes be made in most, and sometimes all, of the seven modalities. For example, improving academic achievement for a particular individual may require the acquisition of reading and study skills (behavior modality), the control of examination anxiety (affect modality), the control of sensations of fatigue when studying (sensation modality), the control of daydreaming (imagery modality), the control of thoughts that cue study avoidance (cognition modality), improvement in relations with teachers, peers, and family members (interpersonal relations

modality), and improvement in physical fitness or health (biology modality). Lazarus (1976) hypothesized that the effectiveness of a combination of treatment procedures will be directly proportional to the number of modalities invoked.

Purpose of the Study

The present study was concerned with the development of an efficient and comprehensive program for aiding skill-deficient students. To that end, the main purpose of the study was to compare various combinations of the components of academic skill training programs. A second purpose was to test the effectiveness of Lazarus' (1976) multi-modal hypothesis as a guiding model in the choice of treatment procedures. The present research project explored the effect to examine the effectiveness of Lazarus' (1976) multi-modal model as a clinical tool in identifying and assessing problems, and as a research tool in selecting treatment combinations more likely to produce long-lasting improvement. The present research project explored the effect of various combinations of (a) group counselling, (b) academic skill training, (c) behavioral self-modification training, and (d) cognitive self-modification training on the academic behavior and achievement of skill-deficient first year college students.

CHAPTER II

Theoretical Foundation

In this chapter the underlying theoretical rationale for three assumptions will be provided. The first assumption is that humans are capable of controlling and modifying their own overt behavior, and can be trained to employ techniques drawn from social learning theory (e.g. stimulus control, covert self-modeling, etc.) to do so more effectively. The second is that cognitive processes (e.g. thinking, self-statements, images, etc.) have considerable influence on human behavior, and by self-modification of these processes, humans can control their own behavior. The third is that a multi-modal approach to complex human problems that invokes more of the seven modalites is likely to be more effective than approaches invoking fewer modalities in terms of individual improvement and longevity and retention of improvement.

The theoretical foundation for this study is drawn from social learning theory. Particular emphasis is placed on the

writings of Bandura, Mahoney, Thoreson, Kanfer, and Lazarus.

Self-modification of Behavior

Bandura (1969) noted that, "People can exercise a certain degree of control over their own behavior (p. 585)." He stated that in the process of controlling their behavior:

> People typically set themselves certain standards of behavior and self-administer rewarding or punishing consequences depending on whether their performances fall short of, match, or exceed their self-prescribed demands (p. 32).

Bandura (1969, p. 255) indicated that the process of self-managed behavior change can be made more efficient by teaching individuals to (a) select well defined objectives, (b) make contractual agreements, (c) use objective records of behavior change, (d) alter stimulus conditions, and (f) alter the target behaviors gradually.

Kanfer and Goldstein (1975) reviewed the various self-management methods and outlined the manner in which they are used for therapeutic change, clearly indicating through the research cited that self-management methods are effective, and that they can be taught to clients. They noted that:

> Self-management techniques supplement other behavior change methods by permitting the extension of behavior modification methods to persons ... who have sufficient motivation and skill to benefit from directions and instructions of the therapist to execute their own programs (p. 310).

It would seem, therefore, that individuals can learn efficient self-management techniques, and can use them to modify their own behavior. It is now appropriate to compare and evaluate the relative effectiveness of the various self-management techniques and combinations of techniques.

Self-modification of Cognitive Processes

With respect to the influence of cognitive processes on behavior, Bandura (1969, p. 40) notes that there are a great many psychological processes that require internal mediating events before external stimuli can exercise control over overt behavior, and that verbal mediation in the form of self instructions is perhaps the most prevalent symbolic regulators of behavior. Bandura (1969, p. 63) also states that implicit rules and strategies that serve to guide appropriate performance in specified situations are a most influential regulatory mechanism, as are covert self-reinforcing operations.

In a similar vein, Mahoney (1974, p. 271) observed that much of the variance observed in human performance is a function of cognitive processes. He said:

> We exhibit complex and enduring patterns of behavior with only occasional incentive feedback. The maintenance of this behavior is often a result of symbolic events - the anticipation of ultimate consequences and

> of interim self-evaluative feedback. A large percentage of our actions are mediated by these cognitive processes (p. 158).

Bandura (1969) noted that cognitive processes can be modified, stating that:

> Persons can not only reliably discriminate internal events, but they can manipulate them by making self-reinforcement contingent upon their occurrence. Furthermore, thought-induced affective reactions may be successfully employed for the purposes of controlling one's own overt behavior (p. 40).

Supporting this contention in a more extensive statement, Thoreson and Mahoney (1974) noted that:

> Internal phenomena such as thoughts, images, and physiological actions can be viewed as responses similar to external behavior. Further, these phenomena are seen as susceptible to the same empirically derived laws and principles as overt or public events. This presumed correspondence between the principles governing overt and covert action is termed the continuity or homogeneity assumption. Its validity and usefulness are supported by several lines of evidence (e.g. Miller, 1959; Barber and Hahn, 1964; Bridger and Mandel, 1964; Bandura, 1969) (pp. 110-111).

Thoreson and Mahoney (1974, pp. 112-120) went on to describe how such internal phenomena can function (a) as antecedent stimuli that trigger other behaviors, both overt and covert, (b) as target behaviors that are cued by other events and controlled by their consequences, and are therefore modifiable, and (c) as consequences of other behavior, both overt and

covert, than can therefore perform a reinforcing, a punishing, or an information feedback function, thus acting as controlling or influencing agents.

With respect to the power of such cognitive processes, Bandura (1969) stated that:

> Situational change would ordinarily result in rapid decrement in responsiveness unless cognitive functions were utilized in a self-reinforcing system that could endure long after conditioning influences were discontinued (p. 37).

It seems clear that cognitive processes are capable of strongly influencing human behavior, and that these processes are themselves modifiable. Cognitive processes would therefore appear to be a potentially powerful agent in the modification of complex human behavior and in the amelioration of complex human problems.

Multi-modal Approach to the Modification of Complex Behavior

A study attempting to compare all the possible combinations of five or six independent variables would require hundreds of groups and thousands of subjects. Since a study of such magnitude is impractical, a theoretical model providing guidelines for a rational choice of which treatment combinations to compare is required.

Lazarus (1976), describing himself as an adherent to social learning theory, "The ... most elegant theoretical system ...(p. 13)." argued that a "multi-modal" approach to therapy is essential for substantial, long-lasting improvement in complex human behavior. He described humans as, "Beings who move, feel, sense, imagine, think, and relate (p. 4)." He went on to define these "areas of being" as modalities, and hypothesized that effective, long-lasting change requires the invoking of most, if not all, of the seven modalities described below. Invoking a modality means identifying a maladaptive condition existing in one of the seven "areas of being" or modalities, and employing therapeutic intervention of whatever nature to correct the condition. The therapeutic <u>strategy</u> does not define which modality is invoked, the <u>location</u> of the target of such intervention does. Thus, when imagery is used in systematic desensitization to control overt fear responses, the modality invoked is the behavior modality, not the imagery modality, because it is in the behavior modality that the problem exists. Similarly, covert behavioral rehearsal and self-instructions are, respectively, imaginal and cognitive in nature, but if directed at altering overt behavior, the behavior modality would be said to be invoked, if directed at altering thoughts, the cognitive modality would be said to be invoked, and so on.

Behavior modality.. Invoking the behavior modality, according to Lazarus (1976, pp. 32-33), involves the attempt to reduce in frequency unwanted surplus reactions, and to increase the frequency, duration, and intensity of useful, creative, fulfilling responses. Included in this category is the acquisition of skills and behaviors to fill voids in the behavioral repertoire of the subjects. Lazarus (1976, p. 33) noted that one can only presume what goes on in the affect, sensation, cognitive, and imagery modalities by attending to the various behaviors emitted, and that the interpersonal relationship modality can easily be regarded as an extension of the behavior modality. He seems to feel, however, that categorization of behavior into the seven modalities is important for therapeutic purposes, and he reserves behavior that is clearly "external" or observable for the behavior modality.

Affect modality.. Invoking the affect modality involves attempting to deal with those feelings that exist beyond the level of awareness as well as those with which the subject is in touch. Efforts made to deal with the denial, displacement, concealment, or suppression of emotion, especially anger and anxiety, as well as efforts made to control or decrease unpleasant emotions and to increase positive feelings are regarded as invoking the affect modality (Lazarus, 1976, pp. 33-34).

Sensation modality. Lazarus (1976, p. 35) noted that some individuals seem to be virtually cut off from their sensory apparatus, unable to enjoy the pleasures of sensory experience, while others, preoccupied with sensations such as headaches, dizziness, and so on, are unable to function efficiently. Problems requiring the control and decrease in frequency of debilitating sensations ranging from hallucinations to sensations of tenseness, and/or the increase in frequency of the appreciation of sensory experience are included in the sensation modality.

Imagery modality. Included in the imagery modality are difficulties related to the, "Wide range of 'mental pictures' which ultimately coalesce in a series of 'self-images'... (Lazarus, 1976, p. 5)." Therapeutic procedures or techniques, when aimed at transforming these self-images from negative to positive, or when aimed at the control of fantasies and day-dreams, are said to invoke the imagery modality (Lazarus, 1976, p. 37).

Cognition modality. Mistaken beliefs, illogical ideas, and irrational self-talk stemming from such beliefs and ideas, as well as faulty logic, are categorized in the cognition modality (Lazarus, 1976, p. 39). Therapeutic procedures such as those developed by Ellis (1962) and Meichenbaum (1977) which

are directed at replacing faulty assumptions and irrational cognitions that undermine daily living, with reality oriented, factual, rational assumptions would be said to invoke the cognition modality. Attempts to alter planning strategies, decision making strategies, expectations, and intentions, would also invoke the cognition modality (Lazarus, 1976, p. 39).

Interpersonal relationship modality. Problems that are created by, or can only be overcome through alteration of, communication patterns with other persons are categorized in the interpersonal relationship modality. Also included is the particular set of behaviors that is made up of those methods by which individuals relate to each other. When therapeutic efforts are directed toward replacing interpersonal conflict or lack of adequate social contact with more satisfying interpersonal behavior, the interpersonal relationship modality is said to be invoked (Lazarus, 1976, p. 41).

Drug modality. Lazarus (1976, p. 43) included in the drug (or biology) modality all problems related to general health, physical fitness, diet, exercise, speech disorders, physical appearance, attire - in short, virtually anything of a non-psychological nature that can have psychological effects. Therapeutic procedures directed toward the correction of such

problems are said to invoke the drug modality. (The term "drug" was chosen by Lazarus because the initial letter "d", when combined with the initial letters of the other six modalities forms the convenient acronym "BASIC ID.")

Lazarus (1976) hypothesized that the various therapeutic approaches are more or less successful to the degree that they deliberately invoke each of the seven modalities during therapy. He stated:

> Durable results are in direct proportion to the number of specific modalities deliberately invoked by any therapeutic system....comprehensive treatment at the very least calls for correction of irrational beliefs, deviant behaviors, unpleasant feelings, intrusive images, stressful relationships, negative sensations, and possible biochemical imbalance (p. 13).
>
> Not every case requires attention to each modality, but this conclusion can only be reached after each area has been carefully investigated (p. 14).
>
> Each modality interacts with every modality. Thus while exploring affective responses, the therapist will undoubtedly tap cognitive material, elicit imagery, sensory reactions, and so on (p. 35).

In a similar vein, Mahoney (1974) stated:

> A second defense of broader coping approaches to therapy stems from the increasingly popular assumption of multideterminism in complex human behavior. Personal adjustment problems are seldom circumscribed and their determining factors are often varied and numerous. To the extent that a therapy procedure addresses itself to only a portion of the relevant causal factors, its success and permanence are jeopardized (p.198).

> Once active contributors to therapeutic impact have been identified, the package may be refined and its underlying processes of change may be better understood. It should be kept in mind, however, that package components may interact complexly. Not only may there be no single active ingredient, but various components may effect therapeutic results only when combined with other package elements. This would, of course add justification to the use of the package. A more frequent phenomenon, perhaps, is that of various treatments contributing differentially to an effect. Component A may enhance initial motivation, and continuation of therapy; component B may effect short-term or situation-specific progress while the more enduring or general effects of component C are awaited, and so on (p. 199).

Also advocating this line of thought is Bergin (1970) who stated, "It is impossible to proceed therapeutically along a single dimension ... (p. 208)," and Thoreson and Coates, (1976) who stated, "It is unlikely.... that any single treatment, by itself, will be effective in modifying complex clinical problems (p. 320)."

Summary

Given the complexity of academic behavior, in particular study behavior, and the multiplicity of factors influencing the acquisition and the efficient performance of such behavior, it appears logical that programs intended to alter academic behavior should adopt a multi-modal approach in order to maximize their effect.

In addition, given that each individual is unique, each may experience similar difficulties with certain aspects of their lives, but each for very different reasons. For example, A, B, and C may not study, A because he does not know how, B because of emotional problems, and C because he does not know how to control his study behavior. It follows, then, that programs which purport to offer remedial assistance for academic problem areas must (a) be individually designed to meet each client's needs, or (b) have separate sub-programs each designed to treat a single aspect of the difficulty under consideration, or (c) be comprehensive enough to be of use to anyone contending with the problem in question. Lacking the time, the manpower to operate individually designed programs, and, most importantly, the diagnostic tools to identify each student's unique needs, the comprehensive approach emerges as the most practical. Since comprehensive programs can be administered to groups of clients, as opposed to individually designed programs, this approach emerges as potentially more economical than either of the others.

There is, therefore, a theoretical foundation to support the beliefs that (a) self-modification of behavior is effective and can be taught, that (b) cognitive processes that are themselves subject to the same rules and principles that govern

overt behaviors, are powerful factors in the control and maintenance of behavior, and that (c) complex human behaviors such as the performance of academic skills can be modified more effectively by programs of a multi-modal nature than by programs employing strategies that invoke fewer modalities.

CHAPTER III

Review of the Literature

The literature pertinent to this study will be reviewed under the following headings: Academic Skill Training and Counselling, Self-modification of Study Behavior, and Cognitive Modification. A summary of authors, treatment procedures, variables measured, sample, sample size, and results of the studies cited is provided in tables 1, 2, and 3.

Academic Skill Training and Counselling

The following are studies dealing with academic skill training and/or counselling approaches to the problems of low academic achievement and academic skill deficiency.

Entwhistle (1960) evaluated 22 study skills programs described in the literature up to 1958. Her conclusions were that (a) a study skills course (of any kind) will usually be

Table 1

Summary of Studies Exploring Study Skills Training and/or Counselling

Study.	Treatment	Variables Measured	Sample	Results
Entwhistle (1960)	Review of 22 Articles	GPA, Reading Scores	N varies, College Freshmen	1. Study Skills courses usually followed by GPA improvement 2. Study skills courses most beneficial to those wishing to take them. 3. Students wishing to take study skills courses but prevented show no significant improvement. 4. GPA gain not necessarily related to content or duration of study skills courses.
Bednar & Weinberg (1970)	Review of 23 studies.	GPA	N varies, Underach. college students.	Improved academic performance associated with programs which are:- 1. structured rather than unstructured, 2. lengthy rather than brief, 3. include counseling in which high levels of therapeutic conditions prevail.
Obler, Francis & Wishingrad (1976)	Counseling + tutoring vs. control.	GPA, completed credits, completed semestres.	N = 1100, College freshmen.	All measures significant.
Sharma (1975)	Rational grp. counseling vs. study skills vs. control	GPA, Irrational Ideas Inventory.	N = 539, Underach. Gr. 10 students	1. Significant reduction in irrational beliefs 2. Significant GPA change at five month followup.
Doctor, Aponte, Burry, & Welch (1970)	Grp. counseling vs. behavior modification	GPA	N = 25 Underach. college students	GPA significant for both groups

Table 2

Summary of Studies Exploring Self-Modification of Study Behavior.

Study	Treatment	Variables Measured	Sample	Results
Beneke & Harris (1972)	cognitive re-structuring + self-modification + study skills	GPA	N = 53 College Students	GPA significant over three semestre follow-up
Richards (1975)	Stimulus con-trol training vs. self-moni-toring vs. combination	Quiz scores Final exam scores	N = 108 College students	Final exam scores sig-nificant for self-moni-toring group
Richards, et al. (1976)	Self-monitoring, info feedback, self-administered consequences	Quiz scores, self reports of no. of hours of study	N = 96 College students	Self-monitoring significant over study skills control. Self-administered consequences not significant
Bristol & Sloane (1974)	self-monitoring vs. self-moni-toring + contracting	Exam grades, self-reports of hours of study	N = 36 College students	Study time increase signif-icant under scheduled differenti l consequences condition
McReynolds & Church (1973)	Self-contract vs. counseling vs. study skills	GPA, SSHA	N = 39 Highschool students	Self-contract and study skills significant all scales of SSHA. GPA not significant.
Greiner & Karoly (1976)	Study skills, info, self-monitoring, self-reward, planning	SSHA, GPA, Quiz scores	N = 96 College students	SSHA and quiz scores signifi-cant. GPA not significant.

Table 3

Summary of Cognitive Modification Studies.

Study	Treatment	Variables measured	Sample	Results
Meichenbaum et al. (1971)	Grp. desensitization vs. cog. modeling + self instructions	Speech anxiety, cog., behavioral, and self-report measures.	N = 53 College students	Both groups significantly reduced anxiety. Interactional effect.
Meichenbaum & Goodman (1971)	Cog. model. vs. cog. model. + self-instructional training	Kagan's measure of cognitive impulsivity	N = 15 Impulsive Children	Both groups significant, experimental group significantly fewer errors.
Meichenbaum (1972)	Grp. desens. vs. cognitive modif.	Test anxiety	N = 21 College students	Both groups significantly duced anxiety
Masters & Santrock (1976)	Differential emission of task-describing statements	Persistence at tasks	N = 200 Nursery school children	Emitted statements significantly affect persistence.
Kanfer et al. (1974)	Oral vs. written contracts, diff. expectations	Persistence at ice water tolerance test	N = 208 Female college students	Cognitive variables significantly affect tolerance.

followed by improvement in GPA that is statistically significant, but not necessarily substantial enough to be of any great importance, (b) such courses are of most benefit to students who wish to take them, (c) motivation alone is not enough; skills training is necessary, and (d) gains are not necessarily related to either content or duration of the courses.

Bednar and Weinberg (1970) reviewed 23 studies (none of which were reviewed by Entwhistle, see above) that evaluated the effectiveness of various treatment programs for underachieving college students. Their findings indicated that highly structured and/or lengthy programs were more effective in producing and maintaining academic improvement than were unstructured or short programs. It was also found that when counselling is part of the program, high therapeutic conditions provide better results than low therapeutic conditions, and that group counselling is more promising than individual counselling or academic study courses. Bednar and Weinberg (1970) stated that counselling, either individual or group, aimed at the dynamics of underachievement, and used in combination with an academic study skills course seemed to be the most potent of the treatment methods.

A six year program for successive classes of academically deficient college freshmen was designed and implemented by Obler,

Francis, and Wishengrad,(1976) utilizing academic instruction, counselling, and tutoring, and emphasizing daily monitoring of the students' personal and study difficulties. This close interaction with the students was made possible by built-in structures that, "Encouraged constant interaction between students, instructors, counsellors, and remedial staff (p. 144)." The success of the program is attributed to this close interaction, and to the multi-dimensional, interdisciplinary approach used. The experimental group for each year was significantly superior to the control group on GPA, credits earned, and semesters completed, however approximately 25 percent of the experimental group felt that they had derived little or no benefit from the program.

Sharma (1975) explored the effects of rational group counselling, teaching of rational ideas, and teaching of study skills on the achievement of anxious underachieving high school students. The results showed a significant reduction in irrational beliefs on the part of the counselled group compared to a no-treatment control group, and five months later, a significantly greater improvement in school marks by the counselled group over each of the other groups.

Doctor, Aponte, Burry, and Welch (1970) in one of the earliest reported attempts to modify college students' study behavior (as well as other behavior related to academic underachievement) compared group counselling with behavior therapy in groups. Both treatments significantly improved GPA compared with the GPA of control groups of no-treatment volunteers and non-volunteers. Both treatment procedures emphasized appropriate methods for studying, note-taking, and test-taking, and both experimental groups recorded similar improvement in study habits. The authors attribute the GPA gains to qualitatively different changes in the two groups. The behavior therapy group reported greater reduction of anxiety in examination and study situations, and the counselling group reflected a greater awareness and sensitivity to interpersonally related situations in which an audience is present and performance of specific behaviors is expected.

In summary, it seems clear that both study skills programs and counselling can have a positive effect on academic skills and GPA, and that a combination of study skills training and counselling is likely to be more effective than either alone. The effect of these two types of treatment procedures is apparently multiplied when they are provided in the context of a highly structured program in which the instructors, counsellors,

and remedial staff work with the students as a closely knit, well coordinated team.

Self-modification of Study Behavior

Studies dealing with self-modification have been appearing in the literature in increasing numbers (Franks and Wilson, 1976, p. 211), and the effect of a variety of self-modification procedures on study behavior has been a popular research topic, particularly in the last few years. This review of the literature on self-modification is limited to those studies concerned with study behavior.

Beneke and Harris (1972) noted that the major problem in improving the study habits of college students lies in teaching the skills to the students and persuading them to use them. The authors designed a program that included cognitive restructuring, training in self-modification procedures, and study skill training. They compared a group that received the program in 11 group sessions led by one of the experimenters with a group in which the individual students worked on their own from printed worksheets distributed by the experimenters, and with a no-treatment control group made up of students who dropped out of treatment after the introductory session. There

was no significant difference in GPA gain scores between the two experimental groups, but students from both groups who completed more than six lessons achieved GPA gain scores that were significantly superior to those obtained by students who completed from one to six lessons, and to those obtained by the no-treatment group. It is noteworthy that the gains in GPA reported were maintained over the three semesters following treatment. It is also noteworthy that almost one third of the subjects dropped out after one session, and only 17 percent completed all of the lessons; no explanation is given. Also of interest is the authors' assertion that while some minimal study time seems necessary for making GPA gains, the gains reported in this study appear to be due to improvements in the quality rather than increases in the quantity of study.

Richards (1975), in an elaborate pyramid design, explored the effect on college students of a study skills advice program combined with one of (a) stimulus control training, (b) self-monitoring training, or (c) stimulus control plus self-monitoring training, all of which were administered in a "bibliotherapy" package. He compared his experimental groups with a no-treatment control group and a no-contact control group, using grades and quiz scores in a psychology course and mean number of pages read per day as outcome criteria. As predicted, study skills

advice was superior to both control groups, and self-monitoring proved to be an effective treatment addition, while stimulus control did not.. An attempt to control for scholastic ability was introduced by separating students into high and low exam scorers on the mid-term mark of the psychology course, after which the treatment was commenced. The treatments were not differentially effective between high and low scorers. Final examination scores were significantly different, but final grades were not. Richards noted that the experiment had the outcome disadvantages of short treatment period, minimal interpersonal contact, and no individual counselling (see Bednar and Weinberg, 1970, cited above).

Richards, McReynolds, Holt, and Sexton (1976) explored the interactional effect of manipulating self-administered consequences and information feedback in self-monitoring procedures. The authors crossed two levels of self-generated information feedback, high (detailed, cumulative, daily graphed data) and low (gross, non-cumulative, weekly graphed data), with three conditions of self-administered consequences - no consequences, covert self-administered consequences (e.g. self-praise), and a combination of covert and overt self-administered consequences (e.g. self-praise plus some tangible reinforcer) - and used exam

grades, and self-reports of numbers of hours studied as outcome criteria. Results indicated that the self-monitoring plus study skills groups were superior to the study skills group, which was in turn superior to the control groups. The manipulation of consequences did not enhance the effectiveness of self-monitoring, nor did the manipulation of information feedback. Subjects who prior to treatment greatly over-estimated the amount of time spent studying eventually equalled the more accurate estimators in number of hours of study per week, but derived significantly greater improvement on examination grade change.

Bristol and Sloane (1974) compared self-monitoring with self-monitoring plus contracting, using study time and psychology exam performance as outcome criteria. Contracting involved signing an agreement to fulfill a series of negotiated study tasks, successful completion of each of which earned the subjects reinforcement in the form of money from the experimenter. Contrary to the results obtained by Richards (1975), and by Richards et al. (1976), self-monitoring alone did not improve examination performance, and study rate under the two no-consequence conditions, while increasing by 30 percent, varied with exam schedules. By comparison, the self-monitoring plus contracting group significantly increased (100%) study time, and "below average"

students significantly improved exam performance over both the self-monitoring and control groups. In addition, "cramming" for exams was eliminated by distributing study time progressively more evenly over successive contract periods. Of particular interest were the findings that study time gains did not generalize to "non-contracted" courses, and that study time correlated moderately with exam scores for both the self-monitoring and the contracting groups.

McReynolds and Church (1973) compared self-contracting (specification of a task and pre-planned self-reinforcement subsequent to, and contingent upon performance of the task), study skills development (a ten session course based on Robinson's SQ4R method), "group counselling" (a combined reading skills and study skills training program), and a no-treatment control. The self-contracting and the study skills development showed significant gains on all scales of the Brown and Holtzman Survey of Study Habits and Attitudes over the no-treatment control. No significant gains were obtained on GPA; however, significantly more of the subjects in the two above-mentioned groups completed ten or more course credits than in the control or the counselling groups. The selection procedure for the subjects in the counselling group differed from that of the other groups which makes

comparison somewhat difficult. It should be noted that the "counselling" treatment did not appear to include any of the therapeutic procedures commonly associated with the usual use of the term "counselling." Of note also, is the fact that approximately 40 percent of the self-contracting group broke their contracts, in some cases apparently because the contracts focused on increasing an already adequate number of hours of study, when the students apparently required an improvement in the efficiency of their study.

Greiner and Karoly (1976) gave all of their subjects a short (one hour) course in study methods based on Robinson's (1970) SQ4R method, then compared groups given (a) information, (b) information plus self-monitoring, (c) information plus self-monitoring plus self-reward, and (d) information plus self-monitoring plus self-reward plus planning. The last mentioned group significantly out performed the others on quiz scores and all scales of the Brown and Holtzman Survey of Study Habits and Attitudes, however no significant difference was found on GPA. Of interest was the failure of the self-monitoring plus self-reward group to outperform the self-monitoring and the control groups. Greiner and Karoly note however, that the training period of one and one-half hours is perhaps too short for the

subjects to grasp the intricacies of such a procedure. Of note also, is the failure of the self-monitoring group to reveal effects. The authors suggest that the reactive effects of self-monitoring reported in the literature may be due to the specificity or complexity of the behavior being monitored, and that because study behavior is not as easy to evaluate relative to a discrete and well specified performance criterion as other behaviors, planning training may help to concretize goals, strengthen outcome expectancies, and thereby potentiate the effects of self-monitoring.

In summary, these studies seem to suggest that a combination of study skill training and training in self-modification of study behavior results in improvement in academic performance and in study habits. Where a variety of combinations of self-modification procedures have been used, there seems to be a positive correlation between the number of procedures used and improvement in academic performance and study habits.

Cognitive Modification

There have been a number of studies published recently which explore the effects of cognitive processes on a variety of complex human behaviors. Of particular note here

is a series of experiments performed by Meichenbaum and his associates, reported below.

Meichenbaum, Gilmore, and Fedoravicius (1971) compared the effects of a standard group desensitization procedure, a group "insight" treatment, and the combination of both, with an attention placebo control group and a no-treatment control group on speech anxiety in undergraduates. The "insight" procedure was derived in part from Rational-Emotive (Ellis, 1962) techniques, and involved making subjects aware of both their anxiety producing self-verbalizations, and ways in which they might counter such verbalizations. Results indicated that the insight treatment was as effective in significantly reducing speech anxiety as the desensitization treatment on a variety of behavioral, cognitive, and self-report measures. Both groups showed significantly more improvement than the control groups, gains which were retained in a three month follow-up. There was an interactional effect between type of treatment and speech situation. The insight treatment was significantly more effective with subjects who suffered from general anxiety in many social situations, while the desensitization treatment was more effective with subjects suffering from situational anxiety in speech situations. The authors stated that further

research may prove the combination of desensitization and the modification of cognitive determiners to be a more efficacious procedure than either treatment procedure alone. The authors suggest that the failure of the combined treatment to prove superior to the others may have been due to insufficient time provided to the subjects for the exploration of incompatible self-instructions and behaviors.

Meichenbaum and Goodman (1971) developed a treatment procedure for impulsive children based on Vygotsky's hypothesis that internalization of verbal commands is the critical step in a child's development of voluntary control of his behavior. In the first of two studies, the authors trained impulsive children to talk to themselves, first overtly, then covertly, giving themselves instructions, for example, to slow down, work carefully, etc., in task situations. The results indicated that the experimental group improved significantly on several performance tests relative to the attentional and the assessment control groups. In the second study, cognitive modeling was compared with cognitive modeling plus self-instruction training on Kagan's MFF test of cognitive impulsivity. Both treatments were successful in slowing down the subjects, but only the combination treatement resulted in a significant decrease in errors. The authors suggest

that therapists can (and should) attempt to modify not only the subject's overt behavioral response, but also the antecedent and/or accompanying cognitions.

Meichenbaum (1972) compared a group desensitization with a cognitive modification procedure, a waiting list control group, and a group of low-test-anxious subjects, in treating test anxiety in college students. The cognitive modification procedure involved the identification of anxiety triggering cognitions coupled with a modified systematic desensitization procedure in which the usual relaxation was paired with self-instructions and coping imagery (in which the subject visualizes himself struggling with, and eventually coping with, the anxiety producing scene), in contrast with the standard Wolpean (Wolpe, 1958) visualization-of-mastery imagery. The cognitive modification procedure produced the best results on all criteria, and was significantly superior to the desensitization group on the Alpert-Haber Anxiety Test. There were no other significant differences between the cognitive modification group and the desensitization group, but both groups were significantly superior to the control group on GPA, on a digit symbol task, and on the Alpert-Haber Anxiety Test. Perhaps more important is the fact that the cognitive modification procedure was able to reduce anxiety in high-test-anxious subjects

to a point well within the range of low-test-anxious subjects. Meichenbaum notes that he is unable to ascertain the exact reasons for the superiority of the cognitive modification procedure because the relative importance of relaxation, coping imagery, suggestions, and modeled examples of task-relevant self-instructions were impossible to isolate in the study. In referring to the series of studies, Meichenbaum states, "The addition of explicit self-instructional training to modeling procedures ... facilitates behavioral change (p. 124)." That is, the combination of procedures produces more gain than individual isolated components.

Masters and Santrock (1976) tested the hypothesis that the evaluations and affective responses which accompany ongoing behavior may operate as reinforcers and punishers, and therefore function as controls over the persistence of such behaviors. Children were introduced to a task and instructed to emit, upon completion of the task, a statement given to them by the experimenter. The statements described the task as either easy or hard, fun or no-fun, etc. The results indicated that children persisted longer at tasks which they labeled "fun" rather than "no-fun," "easy" rather than "hard," when they expressed pride in their work as opposed to being self-critical, and when they

reminded themselves of pleasant rather than unpleasant task-irrelevant events. The importance of these findings for the present study is that they suggest that cognitive strategies may be effective in increasing persistence at other unpleasant tasks such as studying.

Kanfer, Cox, Greiner, and Karoly (1974), using an ice water tolerance test, established that pain tolerance in female undergraduate students was greater with a written rather than an oral contract, when subjects believed they had failed to meet contract conditions, and when they were anticipating reinforcement. The authors interpret the results as a clear demonstration that self-control is a phenomenon affected by both situational and historical variables. The revelation that subjects provided themselves with various distracting or controlling responses, presumably of a cognitive nature is suggestive of the influence of cognitive varables on overt behavior, particularly behavior such as study behavior which is perceived by some students as unpleasant or even painful.

In summary, these studies suggest that cognitive modification procedures, particularly self-modeling and self-instruction training can be used to alter a variety of complex human behaviors, especially when combined with other treatment procedures. Since

persistence at unpleasant tasks is improved by the use of cognitive strategies, it seems likely that the application of these treatment procedures to the modification of study behavior could result in improvement in both study behavior and academic performance.

Statement of the Problem

The literature reviewed shows that study skills training, counselling, and self-modification of study behavior are treatment procedures that can improve study habits and academic performance. In addition, cognitive modification procedures have proved effective in modifying a variety of complex human behaviors, and may therefore be effective in improving study behavior.

The first problem was, therefore, to test the effect of academic skill training, counselling, and self-modification treatment procedures on study behavior and academic performance.

The second problem, in view of the need for a theoretical model to help determine which combinations of treatment procedures hold the most promise of success, was to explore the usefulness of Lazarus' (1976) multi-modal model as a guideline for research and for choice of treatment procedures

Lazarus' (1976) theory states that, "Durable results are in direct proportion to the number of specific modalities deliberately invoked by any therapeutic system (p. 13)." That is, treatment procedures that invoke more modalities will have greater and more durable effects on academic behavior and academic performance than treatment procedures that invoke fewer modalities. The prediction of superiority inherent in Lazarus' (1976) theory requires that all hypotheses generated therefrom be directional.

General Hypothesis

First year college students who are exposed to combinations of treatment procedures that invoke more modalities will show greater gains in study behaviors and academic performance than first year college students who are exposed to combinations of treatment procedures that invoke fewer modalities.

CHAPTER IV

Methodology and Research Hypotheses

In this chapter an outline of the experiment will be given, the methodology will be described in detail, and the research hypotheses will be stated.

Outline of the Experiment

The first purpose of the experiment was to explore the effects of various combinations of treatment procedures on the study behavior and academic performance of college freshmen. The utility of Lazarus' multi-modal model as a clinical and research tool was also to be examined.

A pretest-posttest control group design (Campbell & Stanley, 1963) was employed. Six groups of college freshmen were formed: a no-treatment control group, a reading control group, and four groups that received various combinations of cognitive self-

modification training, behavioral self-modification training, group counselling, and academic skill training.

The outcome criteria used included (a) Final Grade Average, (b) the Brown-Holtzman Survey of Study Habits and Attitudes (Brown & Holtzman, 1964), (c) the Diagnostic Reading Test (Triggs, 1947), (d) self-reports of average number of hours studied per week, and (e) self-reports of the ratio of hours-studied-on-schedule to hours-of-study-scheduled.

A series of single degree of freedom planned comparisons was used to evaluate the results of the experiment. The data were treated in three stages. The first stage compared the combined experimental groups and the two control groups with each other. The second stage compared each of the experimental groups and the two control groups with each other. The third stage explored the effects of the counselling/academic-skills-training dimension and the cognitive-modification/behavior-modification dimension on the four experimental groups.

Methodology

Subjects

The subjects for this experiment were 133 male and female

first year CEGEP (Collège d'Enseignement Général et Professionel), i.e. junior college, students. At registration in September 1977, all of these students (a) had been identified as poor readers by having scored below the fiftieth centile (college freshmen norms) on the Diagnostic Reading Test (Triggs, 1947), (b) had been identified as students with poor study habits by scoring below the fiftieth centile (college freshmen norms) on the Study Habits scale of the Survey of Study Habits and Attitudes (Brown & Holtzman, 1964), and (c) had identified English as their mother tongue. All of the subjects were volunteers, having submitted applications to the academic improvement program in October and November of 1977. It should be noted that while college freshmen are usually entering their thirteenth year of schooling, the students in this sample were only entering their twelfth. College freshmen norms were judged to be more appropriate because a study by Schwartz (1977) revealed that more than 85 percent of the text books used at John Abbott College and other CEGEPs in the Montreal area in 1976-77 were written at the grade thirteen level or higher (table 4).

Procedure

The 133 subjects were randomly assigned to one of six groups. Eighteen were assigned to each of the four experimental

Table 4

Readability Level, Sample of Texts used at J.A.C. 1976-77.

Département	Volume	Auteur	SMOG Score
Biologie	Anatomy & Physiology	Anthony & Kolthoff	15
	Botany	Wilson, Loomis, Steeves	12
	Cell Biology	Avers	16
	Cell Biology, as Molecular Approach	Dyson	14
	Human Anatomy	Ashley	12
	Biology	Curtis	14
Chimie	Introductory Chemistry-Module 3	Jalil & Hoewe	13
	Introductory Chemistry-Module 2	Jalil & Hoewe	13
	Introductory Chemistry-Module 1	Jalil & Hoewe	14
	Chemistry: A Modern Introduction	Brescia	14
Physique	Physics	Genzer & Younger	13
	Study Guide to Accompany Physics		16
	Electricity	Paul, Pierce & Stief	13
	Physics	Tipler	16
	Physics (Study Guide)	Tipler	14
	Energy & the Conservation Laws	Stief	14
	Physics	Beiser	14
	Elementary Physics Ch. 1-13	Weidren & Sells	13
	Ch. 20-28		15
	Fudanmentals of Physics Ch. 1-12	Halliday & Resnick	12
	Ch. 22-32		13
Mathématique	Entering Basic	Sack & Meadows	14
	Calculus with Analytical Geometry	Swolowski	15
	Mathematical Preparations for General Physics with Calculus	Davidson & Marion	13
	College Algebra	de Jean	10
Commerce & Administration	Personnel	Strauss et al	12
	Essentials of Managerial Finance	Weston & Brigham	16
	Introduction to Canadian Business	Archer	15
	Fundamental Accounting Principles	First Canadian Edition	12
	Accounting for Management	Garner	15
Histoire, Economique, Sciences politiques	An Introduction to Political Science	Kahn et al	17
	The Russian Revolution	Medlin	14
	Economics	Lipsy, Sparks & Steiner	14
Géographie	The North American City	Yeates & Garner	16
Psychologie	Understanding Human Behavior	Wrightsman et al	13
	Studies in Adolescence	Grinder	16
	The Psychology of Consciousness	Ornstein	15
	Self-Directd Behavior	Watson & Tharp	13
	On the Psychology of Motivation & Contingency Management	Ornstein et al	19
			15
	The developing Child	Bee	13
	Fundamentals of Scientific Method in Psych	Arnoult	15
	The Social Animal	Aronson	14
Techniques de nutrition	Food Service Management	Echbach	12
	Basic Nutrition in Health & Disease	Howe	12
	Food Executive		12
Sociologie	The Decolonization of Quebec	Milner	15
	The Tyranny of Work	Rinehart	15
	Introduction to Society (Theory)	Dansky	15
	Sociology	Popence	15
	Introduction to Sociology		17
Hygiène dentaire	Oral Pathology	Kerr et al	15
	Dimensions of Dental Hygiene	Steele	15
	Pharmacology for the Dental Hygienist	Kutscher et al	17
	Dental Laboratory Technology	Cathey	14
Techniques de la documentation	Introduction to Librarianship	Gates	16
	ALA rules for Filing Catalog Cards	American Library Assoc.	14
	Canadian Office Procedures	Reid	12

Note. Reprinted from Schwartz (1977).

groups and the Reading Control group (E1, E2, E3, E4, and C1), and 43 to the No-treatment Control group (C2). Table 5 summarizes the distribution of subjects across groups.

The 72 subjects placed in the four experimental groups (18 in each of E1, E2, E3, and E4) were assigned at random to two sections of a psychology course in which they received training in self-modification theory. In this manner, approximately one-half of the subjects from each of the four experimental groups were assigned to each of the two psychology sections, thus insuring that each experimental group was represented in each of the sections, and vice versa.

Ninety subjects (the 72 assigned to the four experimental groups E1, E2, E3, and E4 described in the preceding paragraph, plus the 18 assigned to the Reading Control group C1) were then assigned at random to the two sections of the English course in which they received training in reading skills and study skills. In this manner, approximately one-half of the subjects from each of groups E1, E2, E3, E4, and C1 were assigned to each of the two English course sections, thus insuring that each of the five groups was represented in each of the English course sections, and vice versa.

The procedures described in the preceding paragraphs were employed to control for the possible effect of different treatment procedures in the different Psychology and English course sections.

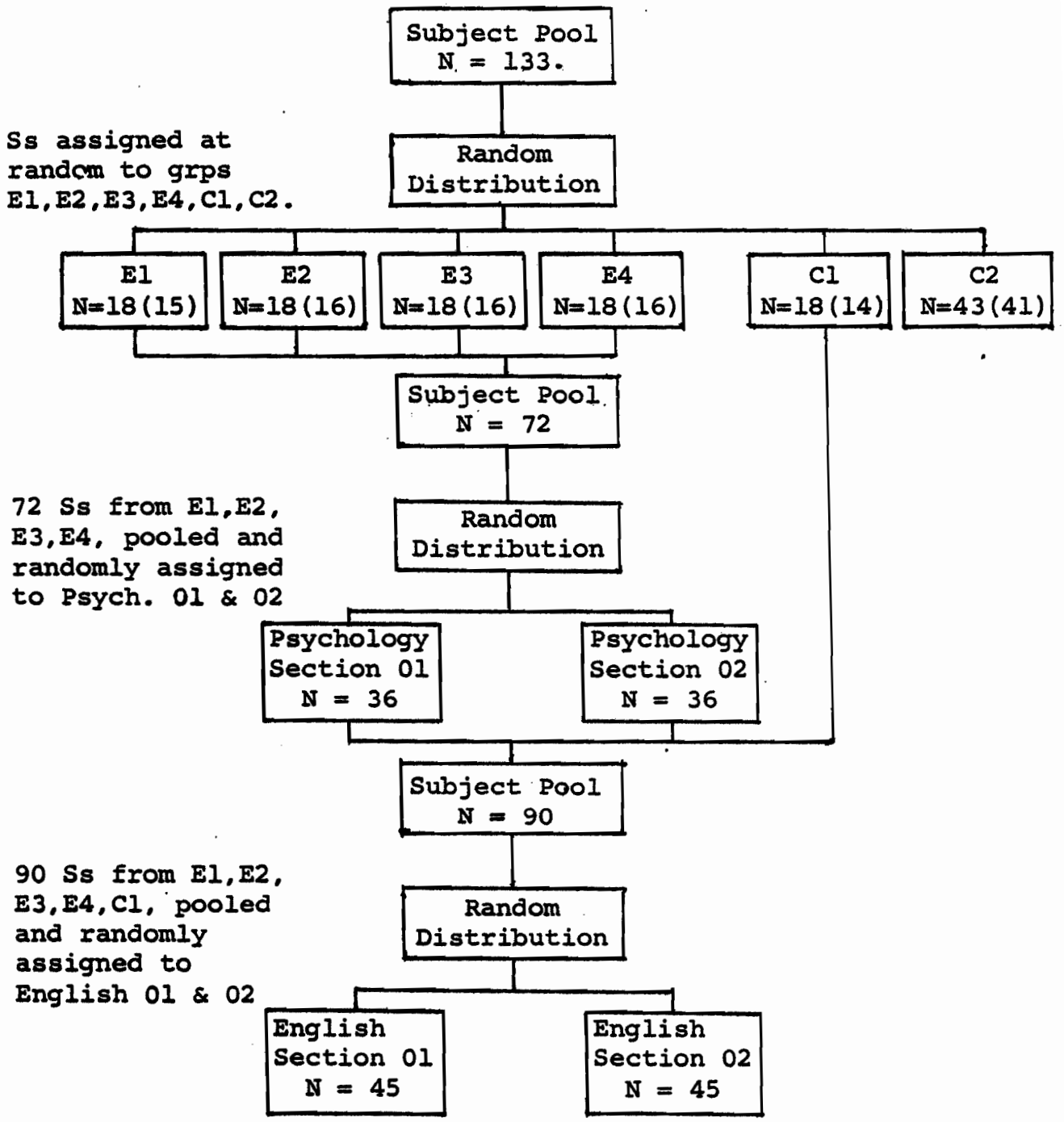
Figure 1 summarizes in flow-chart form the steps taken to achieve random distribution of subjects over treatment procedures.

The 43 subjects placed in the No-treatment Control group (C2) were informed that there were no more places available in the Academic Improvement Program, and that their names had been placed on a waiting list.

The initial sample was reduced by 14 to 118 at post-testing. Two students were discovered to be ineligible, three students who registered for courses in term II chose not to enter the program, three students who entered the program withdrew before completion while remaining enrolled in their other courses (i.e. did not drop out), and seven students dropped out during term II. Tables 5 and 45 list the initial and final distribution of students across groups.

Figure 1

Flow Chart of Random Distribution of Subjects Over Groups



Note. Figures in brackets represent final N actually participating in experiment.

Table 5

Summary of Distribution of Treatments Over Groups, Initial and Final N, and Supervisory Personnel For Treatment Procedures.

Group	Initial N (at pre-testing)	Final N (at post-testing)	Treatments and Supervisors					
			Psychology Course (Experimenter)	English Course (Reading teachers)	Cognitive Modification (Student advisors A & B)	Behavior Modification (Student advisors A & B)	Counselling (Counselors)	Academic Skill Training (Student advisor C)
E1	18	15	*	*	*	-	*	-
E2	18	16	*	*	-	*	*	-
E3	18	16	*	*	*	-	-	*
E4	18	16	*	*	-	*	-	*
C1	18	14	-	*	-	-	-	-
C2	43	41	-	-	-	-	-	-

* Received treatment.

\- Did not receive treatment.

Independent Variables

The modalities invoked, the problems addressed, the specific techniques used, and the treatment procedures within which the specific techniques were administered are summarized in table 6. Table 7 summarizes the various modalities invoked by the various treatment procedures, and table 8 summarizes the specific treatment techniques to which each of the various groups were exposed. It should be noted once again that invoking a modality means attempting to solve a problem by attacking the modality in which the problem exists. Thus, if a behavioral deficit is the problem, then altering the frequency of the behavior would constitute invoking the behavior modality, regardless of the techniques used. The use of imagery in systematic desensitization or self-instructions as in cognitive therapy would still constitute invoking the behavior modality if the problem was one of altering the frequency of some overt behavior.

English course - reading and study skills training. The subjects in groups E1 (N=15), E2 (N=16), E3 (N=16), E4 (N=16), and C1 (N=14) received within the context of a 45 hour, one semester, credit course in English, (a) training in reading skills, (b) training in study skills, and (c) training and practice in the teaching of reading and study skills to a

Table 6

Summary of Modalities, Problems Addressed, Specific Treatment Techniques, and Treatment Conditions in Which Treatment Techniques Applied.

Modality	Problems Addressed	Specific Treatment Techniques	Included In
Behavior	Increase freq. of study behavior	Stimulus control; reinforcement	BM; CM.
	Improve reading & study skills	Skill training	Eng.; AST.
	Decrease freq. of procrastination	Planning; contracting.	BM; CM.
	Acquire self- modification skills	Skill training	Psych.; BM; CM.
Affect	Excessive focus on identity	Self awareness exercises	CLG.
	Negative and/or hidden feelings about self, others, school, etc.	Identification and articulation of feelings	CLG.
Sensation	Fatigue and lassitude when confronting study	Self-instruction; covert behavioral rehearsal	CM.
Imagery	Excessive daydreams to avoid study	Self-instructions; self-modelling covert behavioral rehearsal	CM.
	Insufficient images of self as successful student	Covert behavioral rehearsal; Guided fantasies	CM CLG.
	Negative self-images	Self-awareness exercises.	CLG.
Cognition	Irrational self-talk	Self-instructions; coping self-statements.	CM
	Problems in making choice between study and higher probability beh.	Self-instructions; coping self-statements	CM
Interpersonal Relationships	Excessive focus on social activities	Trust building; self-disclosure exercises.	CLG.
	Interpersonal conflict.	Communication games & exercises	CLG.
	Lack of adequate peer contact	Communication games & exercises	CLG.

Key.

CM : Cognitive Modification
BM : Behavior Modification
AST : Academic Skill Training
CLG : Counselling
Eng : English course.
Psych: Psychology course.

Table 7

Summary of Modalities Invoked by Treatment Procedures

	Treatment Procedures and Modalities Invoked.						
Group	English Course	Psychology Course	Cognitive Modification	Behavior Modification	Counselling	Academic Skill Training	Total of Different Modalities Invoked.
E1	B.	B.	B,S,I,C.	-	A,I,IP.	-	6 (B,A,S,I,C,IP)
E2	B.	B.	-	B.	A,I,IP.	-	4 (B,A,I,IP)
E3	B.	B.	B,S,I,C.	-	-	B.	4 (B,S,I,C)
E4	B.	B.	-	B.	-	B.	1 (B)
C1	B.	-	-	-	-	-	1 (B)
C2	-	-	-	-	-	-	0

Key.

B : Behavior modality
A : Affect modality
S : Sensation modality
I : Imagery modality
C : Cognition modality
IP : Interpersonal Relationship modality

Table 8

Summary of Treatment Conditions and Specific Treatment Activities Experienced by Groups.

Group	Treatment Condition	Specific Treatment Activities
E1	English Course Psychology Course Group Counselling Cognitive Modification	Reading skill training; study skill training; tutoring. Self-modification theory; practice as change agent. Trust & group building; identification/articulation of feelings; self awareness; clarification of self-concept; ownership of choices. Def'n of target beh.; stimulus control; planning & contracting; self-administration of reinforcement; identification & countering of negative self-statements; covert self-rein.; covert beh'l rehearsal; covert self-modelling.
E2	English Course Psychology Course Group Counselling Behavior Modification	Reading skill training; study skill training; tutoring. Self-modification theory; practice as change agent. Trust and group building; identification/articulation of feelings; self-awareneess; clarification of self-concept; ownership of choices. Def'n of target behavior; stimulus control; planning and contracting; self-administration of reinforcement.
E3	English Course Psychology Course Academic Skill Training Cognitive Modification	Reading skill training; study skill training; tutoring. Self-modification theory; practice as change agent. Learning/memorization/forgetting; note-taking; scheduling; reading skills; examination writing techniques. Def'n of target beh.; stimulus control; planning and contracting; self-administration of rein.; identification and countering of negative self-statements; covert self-reinforcement; covert beh'l rehearsal; covert self-modelling.
E4	English Course Psychology Course Academic Skill Training Behavior Modification	Reading skill training; study skill training; tutoring; Self-modification theory; practice as change agent. Learning/memorization/forgetting; note-taking; scheduling; reading skills; examination writing techniques Def'n of target behavior; stimulus control; planning and contracting; self-administration of reinforcement.
C1	English Course	Reading skill training; study skill training; tutoring.
C2	No Treatment	

grade seven elementary school student. The English course follows the procedure developed and tested by Schwartz (1977). The standard course load for a one semester course at all CEGEPs, including John Abbott College is 45 in-class hours and 45 out-of-class hours. (see appendix for course outline and Schwartz, 1977, for complete details).

Treatment procedures that are designed to correct behavioral deficits by the acquisition of new behavior are said to invoke the behavior modality (Lazarus, 1976). The English course procedure, emphasizing the acquisition of reading and study skills, was intended to invoke only the behavior modality.

Psychology course - self-modification theory. The subjects in groups E1, E2, E3, and E4 received within the context of a 45 hour, one semester, credit course in psychology, (a) training in the principles of self-modification of behavior, and (b) training and practice as a change agent in applying behavior modification skills to aid a grade seven elementary school student in modifying his/her reading and study behaviors. The standard course load for a one semester course is 45 in-class and 45 out-of-class hours.

As in the case of the English course treatment, the

Psychology Course treatment procedure emphasizes the acquisition of skills, in this case, self-modification skills, and was intended therefore to invoke only the behavior modality as described by Lazarus (1976).

Cognitive modification. As part of the psychology course described above, subjects in groups E1 and E3 worked separately from groups E2 and E4 for 10 half-hour periods in small groups led by student advisors. Each student's task was to design and implement a personal "self-modification-of-study-behavior" program based on cognitive modification theory (see Mahoney, 1974). The students worked from a series of handouts developed by the experimenter (see appendix) based on Watson and Tharp (1976), Richards (1975), and Meichenbaum's (1974a, 1974b, 1975) self-instructional training

In the Cognitive Modification treatment, as in the Behavior Modification treatment described in the next section, each student's program design included (a) definition of target behaviors, (b) manipulation of environmental stimule that cue study behavior and study avoidance behavior, (c) planning and contracting, and (d) self-administration of tangible reinforcement and reinforcement in the form of high probability behavior received contingent upon the performance of lower probability

behavior (Premack, 1965). For example, a student may reinforce the lower probability behavior of studying by permitting himself to perform the higher probability behavior of television watching after the performance of the contracted study behavior.

In the Cognitive Modification treatment as opposed to the Behavior Modification treatment described below, each student also included in his/her program (a) the identification of self-statements (thoughts) which cue study avoidance, (b) the development of a set of positive countering self-statements designed to cope with study avoidance and to cue study behavior, (c) self-reinforcement for the production of coping self-statements, and (d) the administration of covert self-reinforcement in the form of self-praise for the performance of contracted behavior. In addition, during each of group sessions 5 to 10, the students in groups E1 and E3 practised covert self-modelling and covert behavioral rehearsal of the coping strategies they had designed for themselves.

A full report, including program design and discussion of results, constituted the term paper for the psychology course in which the students in both the Cognitive Modification treatment condition and the Behavior Modification treatment condition were enrolled, and counted for 50 percent of the final mark for

that course. In order to minimize innacuracy of self-reporting, it was impressed upon the students that the evaluation of the term paper was to be based entirely upon the skill, knowledge, and effort shown in the design and implementation of their program, and not on success or failure in modifying study behavior.

The Cognitive Modification treatment procedure was intended to invoke four of the modalities described by Lazarus (1976) - the behavior modality (directed at altering the frequency of study behavior and study avoidance behavior), the sensation modality (directed at eliminating sensations of fatigue and lassitude when confronted with study), the imagery modality (directed at reducing the frequency of daydreams and fantasies used to avoid study), and the cognition modality (directed at irrational self-talk and decision-making difficulties).

Behavior modification. As part of the Psychology course described above, subjects in groups E2 and E4 worked separately from groups E1 and E3 for 10 half-hour periods in small groups led by student advisors. Each student's task was to design and implement a personal "self-modification-of-study-behavior" program based on operant conditioning theory (Skinner, 1953). The subjects worked from a series of handouts developed by the experimenter which were identical to those used by the groups in

the Cognitive Modification treatment, except that all portions involving cognitive modification procedures were deleted (see appendix).

Each student's program design included (a) definition of target behaviors, (b) manipulation of environmental stimuli that cue study avoidance and study behavior, (c) planning and contracting, and (d) the self-administration of reinforcement for the successful performance of contracted activities.

During group sessions 5 to 10, the students described their programs to each other using a group discussion format, with the intention of aiding one another in solving problems related to the design and/or implementation of their programs.

As in the Cognitive Modification treatment, subjects in the Behavior Modification treatment condition were required to submit full report, including a description of the program design and a discussion of results, as a term paper for the psychology course in which they were enrolled. The term paper counted for 50 percent of the final mark for the psychology course. As in the Cognitive Modification treatment, the subjects in the Behavior Modification treatment had impressed upon them that the evaluation of the term paper was to be based

entirely upon the skill, knowledge, and effort shown in the design and implementation of their program, and not on success or failure in modifying their study behavior.

The Behavior Modification treatment procedure, directed as it is toward altering the frequency of study behavior and study avoidance behavior, was intended to invoke only the behavior modality. It should be noted that although planning and contracting are included in this treatment, these activities are not the object of the modification activities, but rather are modification techniques directed at altering the frequency of overt behavior, and therefore the cognition modality was not deliberately invoked. Modality is determined by the problem or the desired response changes, not by the treatment procedure (see Lazarus, 1976, p. 5).

Group counselling. Subjects in groups E1 and E2 attended nine one-and-one-half-hour sessions of group counselling led by staff counsellors from the Student Services department of John Abbott College. The subjects in groups E1 and E2 were randomly assigned to one of four groups of nine members each.

The counselling approach used was client centred/gestalt oriented, emphasizing client responsibility for choice of

material dealt with within the context of a series of structured exercises. The objectives included (a) trust building, (b) group building, (c) focusing on "here-and-now," (d) identification and articulation of feelings, (e) self-disclosure, (f) self-awareness, (g) clarification of self-concept, and (h) ownership of choices in, and control of, present and future.

Counsellor behaviors included the standard verbal repertoire of reflection of feelings, paraphrasing, summarization, and so on, as well as counsellor self-disclosure. The counsellors agreed to respond selectively to expression of feelings, and to gently, but persistently, insist on the use of "I" statements by the clients as well as keeping the discussion focussed on the "here-and-now." Where appropriate, that is, when two or more topics arose at the same time or when spontaneous verbalizations from the group members stopped for any length of time, the counsellors were to focus the group's attention on that part of the topic which directly or indirectly appeared to have an effect on academic behavior.

Structured exercises included (a) the use of graphics (coat-of-arms, flip-charts, etc.), (b) non-verbal communication exercises, (c) guided fantasies, and (d) games (inclusion, exclusion, emotional cards, etc.), and involved client

participation in various sizes of groups, in pairs, and as individuals (see appendix for complete session by session description of activities).

The Group Counselling treatment procedure was intended to invoke three of the modalities described by Lazarus (1976) - the affect modality (directed at negative and/or hidden feelings about the self, others, school, etc.), the imagery modality (directed at insufficient positive and excessive negative images of self), and the interpersonal relationship modality (directed at interpersonal conflict with others, excessive focus on social activities, etc.).

Academic skill training. Subjects in groups E3 and E4 attended nine one-and-one-half-hour sessions of "How to Survive in College," a tape recorded series of lectures with guided note-taking and pre- and post-lecture quizzes (Casebeer, 1969). The topics covered included (a) learning, memorization, and forgetting, (b) listening and note-taking, (c) scheduling, (d) reading skills, and (e) examination writing techniques. The subjects previewed the lecture material by attempting to answer the questions on a quiz, took notes while listening to the lecture, attempted to answer the questions on the quiz again, and then scored their own quizzes by comparing answers

with other members of the group.

The Academic Skill Training treatment procedure, by virtue of being directed toward the acquisition of new behavior, was intended to invoke only the behavior modality described by Lazarus (1976).

Summary of treatments across groups. The treatments experienced by the various groups were as follows:

1. Subjects in group E1 were enrolled in the English course and in the Psychology course, and received the Counselling and the Cognitive Modification treatments. Six modalities were invoked: behavior, affect, sensation, imagery, cognition, and interpersonal relationships.

2. Subjects in group E2 were enrolled in the English course and the Psychology course, and received the Counselling and the Behavior Modification treatments. Four modalities were invoked: behavior, affect, imagery, and cognition.

3. Subjects in group E3 were enrolled in the English and in the Psychology courses, and received the Academic Skill Training and the Cognitive Modification treatments. Four modalities were invoked: behavior, sensation, imagery, and cognition.

4. Subjects in group E4 were enrolled in the English course and the Psychology course, and received the Academic Skill

Training and the Behavior Modification treatments. Only the behavior modality was invoked.

5. Subjects in group C1 were enrolled in the English course, but received no other treatment. Only the behavior modality was invoked.

6. Subjects in group C2 were not enrolled in either the English course or the Psychology course, nor did they receive any other treatment. They were advised by letter that they had not been accepted into the academic improvement program because there was an insufficient number of places available, that their names had been placed on a waiting list, and that guaranteed acceptance into the next session of the program would be contingent upon their availability for testing at the end of term. No modalities were invoked.

Dependent Variables

Pretesting on all dependent variables except Final Grade Average (FGA) was done in September of the first year of the experiment, at the beginning of the first semester. Posttesting was done in May of the following year at the end of the second semester. Follow-up to test for the durability of gains was planned for the end of the third and fourth semesters. Pretesting

on FGA was done in December of the first year, at the end of the first semester.

Final grade average (FGA). Since courses in the CEGEPs in Québec are one semester in length, the average of final grades of courses taken by each subject in the first semester (September to December, 1977) was used as the pretreatment score on this measure, and the average of final grades of courses taken in the second semester (January to May, 1978) was used as the posttreatment measure. The final grade averages for terms three and four were to have been used as follow-up measures, but for reasons discussed in chapter V (i.e. uneven dropout distribution over groups) these scores were disregarded, and only the change in final grade average (FGA) from term I to term II was used as an outcome criterion in this experiment.

It was assumed that the effect of the various treatment procedures would manifest itself in differences between groups on final grade average change. If this assumption was correct, then FGA change would be a reliable, valid, unobtrusive, and important measure.

Study habits (DA and WM). The Survey of Study Habits and Attitudes (Brown & Holtzman, 1964) is a diagnostic and research

instrument which measures motivation for studying, study methods, and attitudes towards teachers and towards education. The survey is comprised of four scales: Delay Avoidance (DA), Work Methods (WM), Teacher Approval (TA), and Educational Acceptance (EA). There are also two sub-totals, Study Habits (SH = DA + WM), and Study Attitudes (SA = TA + EA), and a total score, Study Orientation (SO = SH + SA). The Survey of Study Habits and Attitudes (SSHA) has been found to have a medium positive correlation with GPA (0.25 to 0.45), and the test-retest reliability reported is in the range of 0.83 to 0.93 depending on the time interval between tests.

The SSHA has been used as one of the major outcome criteria in many, if not most, of the study behavior experiments reported in the literature. In this study, the Delay Avoidance (DA) and the Work Methods (WM) scales were used. The Teacher Approval and the Educational Acceptance scales were not used because (a) in this study there was no attempt made to directly alter attitudes towards teachers or education, (b) scores on the Teacher Approval scale might have been affected by the fact that the experimenter was the teacher of the Psychology course, and (c) a study by Khan and Roberts (1975) revealed that only 12 percent of the items in the EA scale had a loading of 0.35 of more on the fourth

factor, and 12 of the 25 items in this scale did not load on any of the four factors.

Reading efficiency (RE). The Diagnostic Reading Test (DRT) (Triggs, 1947) provides measures of reading speed, vocabulary, and comprehension. Validity reported is in the range of 0.44 to 0.68, and test-retest reliability is reported at 0.74. In this study, the measure used was the Reading Efficiency (RE) measure derived by Schwartz (1977) by multiplying the combined raw scores of the vocabulary and comprehension subtests by a whole number which is calculated by dividing the reading speed in words per minute by 25 and disregarding any remainder. This procedure is required to provide a global measure which includes reading speed, comprehension and vocabulary. Dividing the reading speed by 25 provides a weighting effect which reduces the potential for distortion of the total score by extraordinarily high speed scores.

The Reading Efficiency (RE) measure was used in this study because (a) it has been used for several years in the College Reading Research Program (Schwartz, 1977) both as a selection screening device and as an outcome criterion measure, (b) it was used to screen subjects for this study, (c) it served as a means for determining how well the assignments for the English course

had been performed, and therefore might provide some insight into whether study and self-modification techniques were actually being used, and (d) improvement in reading scores has, in circumstances similar to those in this experiment, been shown to have a positive effect on GPA (Fairbanks, 1974).

Self-reports of number of hours per week studied (HW). Several studies have reported a positive correlation between reported hours of study and academic achievement (Beneke & Harris, 1972; Richards, 1975). To collect data on this behavioral measure, the subjects in groups E1, E2, E3, and E4 recorded the number of hours studied each day on a timetable form (see appendix) covering one week's duration, and graphed the data at the end of each week. The timetable sheets were turned in at the end of each week to the student advisors in charge of the self-modification sessions. The data were checked, tabulated, and turned over to the experimenter at the end of the treatment period.

Data on the number of hours per week studied were not collected for groups C1 (Reading Control) and C2 (No-treatment Control) because such self-monitoring has been shown to be sufficiently reactive to be regarded as a self-modification procedure (Richards, 1975; Van Zoost & Jackson, 1974), and

the design of the experiment did not intend for these groups to be exposed to any self-modification treatment procedure.

The average of the first five weeks of the fifteen week semester was taken as the pretreatment score, or baseline. The students officially commenced their self-modification programs at the start of the sixth week, and the average of the second five week span (weeks 6 to 10) was taken as the posttreatment score. Data from the third five week span (weeks 11 to 15) were disregarded because pilot studies had shown that (a) most students show great increases in study hours in the last few weeks of the semester (presumably in response to the proximity of final examinations), and (b) many students stop collecting and/or returning data during this period, presumably because they feel they can no longer spare the time required to collect and graph the data, or perhaps because they regard their program as "successful," and no longer feel the need to collect the data.

Self-reports of the ratio of hours-studied-on-schedule to hours-of-study-scheduled (SCHED). A series of studies exploring the effects of contracting (Greiner & Karoly, 1976; Kanfer, Cox, Greiner & Karoly, 1974) suggests that fulfillment of study contracts is positively correlated with academic achievement. To collect data on this behavioral measure, subjects in groups

E1, E2, E3, and E4 scheduled their contracted hours of study each week on a weekly timetable form, recorded on it the number of hours actually studied in the scheduled time slots, graphed the data, and handed the timetable form in to the student advisors in charge of the self-modification sessions at the end of each week. The student advisors checked the data, tabulated it, and turned it over to the experimenter at the end of the treatment period. The measure was calculated by dividing the total number of hours actually studied on schedule during weeks 6 to 10 by the total number of hours of study scheduled during that period.

Table 9 summarizes the groups on which the data from the various criterion measures were collected.

Statistical Treatment

To analyze the residuals, and the pre-, post-, and change scores, a series of single degree of freedom planned comparisons was performed. The data were analyzed in three stages. The first stage compared three groups with each other - the No-treatment Control group (C2), the Reading Control group (C1), and a group made up of the combined experimental groups (E1+E2+E3+E4) - on final grade average. The second stage compared each of the

Table 9

Summary of Groups on Which Data From Various Measures Collected

	Dependent Variables											
Group	FGA I	FGA II	DA Pre	DA Post	WM Pre	WM Post	RE Pre	RE Post	HW Pre	HW Post	SCHED	
E1	*	*	*	*	*	*	*	*	*	*	*	
E2	*	*	*	*	*	*	*	*	*	*	*	
E3	*	*	*	*	*	*	*	*	*	*	*	
E4	*	*	*	*	*	*	*	*	*	*	*	
C1	*	*	*	*	*	*	*	*	-	-	-	
C2	*	*	*	-	*	-	*	-	-	-	-	

* data collected
\- data not collected

Key.

FGA I : Final Grade Average - term I
FGA II: Final Grade Average - term II
Pre : Pre-treatment score
Post : Post-treatment score
DA : Delay Avoidance scale
WM : Work Methods scale
RE : Reading Efficiency measure
HW : Average Hours of Study per Week
SCHED : Ratio of Hours Studied on Schedule to Hours of Study Scheduled.

experimental groups (E1, E2, E3, E4), the Reading Control group (C1), and the No-treatment Control group (C2) with each other. A multivariate analysis of variance program was used to carry out single degree of freedom planned comparisons analyzing the set of variables consisting of final grade average (FGA), study habits (DA,WM), and reading efficiency (RE). In order to control for possible pretest differences, an analysis of residual scores was performed which gives the same results as does an analysis of covariance. The third stage evaluated the effects of the counselling/academic-skill-training dimension and the cognitive-modification/behavior-modification dimension on the four experimental groups, E1, E2, E3, and E4. A multivariate analysis of variance program was used to carry out single degree of freedom planned comparisons analysing the set of variables consisting of final grade average (FGA), study habits (DA,WM), reading efficiency (RE), hours of study (HW), and ratio of hours-studied-on-schedule to hours-of-study-scheduled (SCHED). In the same manner as described above, the analysis was repeated using residual scores.

All the analyses were done using the Finn (1972) Multivariance program. The Finn program performs an exact least squares analysis, and can be used for both univariate

and multivariate analyses. The Finn (1972) program can also be used to set up single degree of freedom contrasts.

Personnel

Experimenter. The author of the dissertation, a doctoral candidate with 18 years of experience in counselling and teaching, supervised the experiment and coordinated the activities of the other personnel. The experimenter taught the psychology course in which the subjects in groups E1, E2. E3, and E4 were enrolled A description of the steps taken to minimize the potential for experimenter bias created by the experimenter's knowledge of which students were in the experimental groups and which were in the control groups is to be found on page 73.

Reading teachers. Both reading teachers had M. Ed. degrees in the teaching of reading, and both had several years of experience in teaching remedial reading at the junior college level. One of the reading teachers had worked in the College Reading Research program (Schwartz, 1977) for several years, and had aided in the development of the English course treatment described on page 47. The two teachers conferred regularly with each other and with the experimenter during the treatment period in order to insure that the subjects in both sections of the

English course were receiving similar exposure to the treatment procedures.

The reading teachers were not informed as to the full scope of the experiment, nor of the content or intent of the other treatment procedures. They had contact with the experimenter and with two of the student advisors, but not with the counsellors nor the third student advisor.

Counsellors. Two of the three counsellors were M. Ed. graduates with several years of experience in counselling at the junior college level, and the third was an M. Ed. candidate in her internship year at McGill University. All were staff members employed by the Student Services department of John Abbott College. The counsellors developed and implemented the Counselling treatment procedure according to guidelines provided by the experimenter, and met with each other regularly during the course of the experiment in order to insure that the subjects in each of the four counselling groups (composed of subjects from groups E1 and E2, as described on page 55) received similar treatment.

The counsellors were not informed as to the full scope of the experiment, they were not informed as to the content nor

intent of the other treatment procedures, and they had no contact with any of the other personnel except the experimenter.

Student advisors. The two student advisors in charge of the administration of the self-modification treatment procedures were graduates of John Abbott College who had participated in the College Reading Research program (Schwartz, 1977), and who had therefore experienced the reading training program at first hand as students. Both had been students of the author in a psychology course during which, as a pilot study, the Cognitive Modification treatment procedure was developed. The student advisors (a) conducted the random assignment of the subjects to the various treatment groups, (b) aided the reading teachers in the training and supervision of the reading tutors, (c) conducted the Cognitive Modification and the Behavior Modification treatment sessions following the material developed by the experimenter, and (d) collected and tabulated the weekly data on the behavioral measures (HW and SCHED). A third student advisor who had no previous experience with the program was responsible for supervising the tape-recorded Academic Skill Training treatment procedure. His duties included (a) handing out the pre-quiz, (b) playing the tape-recorded lecture, and (c) conducting the post-quiz scoring discussion. The student advisors met regularly

with the experimenter during the course of the experiment to report on progress and to discuss problems. The two student advisors aiding the reading teachers also met regularly with the reading teachers.

The student advisors were not informed as to the scope of the experiment, were not informed as to the content or intent of the treatment procedures in which they were not involved, and had no contact with the counsellors.

Students. The students who were the subjects of this experiment were given the following information:

1. All the treatment procedures being employed in this program had proved useful in other experiments.

2. Different groups were receiving different combinations of treatment procedures.

3. The experimenter did not know which combinations of treatment procedures would be most efficacious for which students, so the assignment of students to treatment groups had been at random.

Students in each group were informed as to the rationale supporting the particular treatment procedures to which they were being exposed. They were given no information regarding

the content of the other treatment procedures, nor any information regarding the scope of the entire experiment.

Table 4 shows the distribution of supervisory personnel over treatment procedures.

Experimenter Bias

The experimenter, who was also the administrator of the Psychology course treatment, was aware of which subjects were members of the experimental groups and which were members of the control groups. It was not made known to the experimenter until after the treatment period to which specific experimental group, E1, E2, E3, or E4, the subjects in the experimental condition were assigned. Nevertheless, in order to minimize the potential for experimenter bias, the following steps were taken:

1. Members of each of the four experimental groups, E1, E2, E3, and E4, were randomly assigned to each of the two psychology course sections to control for the possible effects of differential teaching procedures.

2. The random assignment of subjects to the various groups and treatment procedures was done by the student advisors, and this information was withheld from the experimenter until after the end of the treatment period.

3. The different treatment procedures were supervised by different personnel who had no contact with each other except as described on pages 69 to 73, and who were not informed regarding the total scope of the experiment until after the treatment period.

4. All treatment procedures other than the psychology course were supervised by personnel other than the experimenter.

Research Hypotheses

In order to give an overview of the question being addressed, the general hypothesis first presented in chapter III will be restated, followed by the specific research hypotheses.

General hypothesis. First year colleges students who are exposed to combinations of treatment procedures that invoke more modalities will show greater gains in study behaviors and academic performance than first year college students who are exposed to combinations of treatment procedures that invoke fewer modalities.

Specific research hypotheses. In each of the following hypotheses, the group for which the greater gains have been predicted has been exposed to treatment procedures invoking a greater number of the modalities described by Lazarus (1976)

than the group with which it is being compared. It is to be noted that the number of modalities invoked, not the treatment procedures themselves, is the critical determinant in predicting superiority. The level of significance chosen for the acceptance of the hypotheses was an alpha of 0.05. The specific research hypotheses are summarized in table 10, and are presented below in operational form.

1. The group made up of the combined experimental groups (E1+E2+E3+E4) will achieve significantly greater gains than the No-treatment Control group (C2) on final grade average (FGA).

2. The group made up of the combined experimental groups (E1+E2+E3+E4) will achieve significantly greater gains than the Reading Control group (C1) on final grade average (FGA).

3. The Reading Control group (C1) will achieve significantly greater gains than the No-treatment Control group (C2) on the dependent variables measured

4. The group receiving Cognitive Modification plus Counselling (E1) will achieve significantly greater gains than the group receiving Behavior Modification plus Counselling (E2) on the dependent variables measured.

Table 10

Summary of Hypotheses

Hyp.	Groups Compared	Dependent Variables
1	E1+E2+E3+E4 > C2	FGA
2	E1+E2+E3+E4 > C1	FGA
3	C1 > C2	FGA
3	C1 > C2	FGA, DA, WM, RE.
4	E1 > E2	FGA, DA, WM, RE.
5	E1 > E3	FGA, DA, WM, RE.
6	E1 > E4	FGA, DA, WM, RE.
7	E1 > C1	FGA, DA, WM, RE.
8	E1 > C2	FGA, DA, WM, RE.
9	E2 > E4	FGA, DA, WM, RE.
10	E2 > C1	FGA, DA, WM, RE.
11	E2 > C2	FGA, DA, WM, RE.
12	E3 > E4	FGA, DA, WM, RE.
13	E3 > C1	FGA, DA, WM, RE.
14	E3 > C2	FGA, DA, WM, RE.
15	E4 > C2	FGA, DA, WM, RE.
16	E1+E2 > E3+E4	FGA, DA, WM, RE, HW, SCHED.
17	E1+E3 > E2+E4	FGA, DA, WM, RE, HW, SCHED.

Key to Dependent Variables Abbreviations.

FGA : Final Grade Average
DA : Delay Avoidance scale of SSHA
WM : Work Methods scale of SSHA
RE : Reading Efficiency measure of DRT
HW : Average number of hours of study per week
SCHED : Ratio of hours-studied-on-schedule to hours-of-study-scheduled.

5. The group receiving Cognitive Modification plus Counselling (E1) will achieve significantly greater gains than the group receiving Cognitive Modification plus Academic Skill Training (E3) on the dependent variables measured.

6. The group receiving Cognitive Modification plus Counselling (E1) will achieve significantly greater gains than the group receiving Behavior Modification plus Academic Skill Training (E4) on the dependent variables measured.

7. The group receiving Cognitive Modification plus Counselling (E1) will achieve significantly greater gains than the Reading Control group (C1) on the dependent variables measured.

8. The group receiving Cognitive Modification plus Counselling (E1) will achieve significantly greater gains than the No-treatment Control group (C2) on the dependent variabls measured.

9. The group receiving Behavior Modification plus Counselling (E2) will achieve significantly greater gains than the group receiving Behavior Modification plus Academic Skill Training (E4) on the dependent variables measured.

10. The group receiving Behavior Modification

plus Counselling (E2) will achieve significantly greater gains than the Reading Control group (C1) on the dependent variables measured.

11. The group receiving Behavior Modification plus Counselling (E2) will achieve significantly greater gains than the No-treatment Control group (C2) on the dependent variables measured.

12. The group receiving Cognitive Modification plus Academic Skill Training (E3) will achieve significantly greater gains than the group receiving Behavior Modification plus Academic Skill Training (E4) on the dependent variables measured.

13. The group receiving Cognitive Modification plus Academic Skill Training (E3) will achieve significantly greater gains than the Reading Control group (C1) on the dependent variables measured.

14. The group receiving Cognitive Modification plus Academic Skill Training (E3) will achieve significantly greater gains than the No-treatment Control group (C2) on the dependent variables measured.

15. The group receiving Behavior Modification plus

Academic Skill Training (E4) will achieve significantly greater gains than the No-treatment Control group (C2) on the dependent variables measured.

16. There will be a main effects Counselling/Academic-Skill-Training. The group made up of the two groups receiving the Counselling treatment (E1+E2) will achieve significantly greater gains than the group made up of the two groups receiving the Academic Skills Training treatment (E3+E4) on the dependent variables measured.

17. There will be a main effects Cognitive-Modification/Behavior-Modification. The group made up of the two groups receiving the Cognitive Modification treatment (E1+E3) will achieve significantly greater gains than the group made up of the two groups receiving the Behavior Modification treatment (E2+E4) on the dependent variables measured.

CHAPTER V

Results

In order to establish whether there were any significant pretreatment differences between the groups despite the random assignment of subjects to treatment conditions, each comparison included analyses of pre-scores and post-scores as well as change scores. The comparisons involving groups E1, E2, E3, E4, and C1 (i.e. excluding C2) also included an analysis of residuals. The description and discussion of results will be primarily concerned with change scores and residuals. Except where noted, no significant differences were revealed in the pre-score analyses. Table 52 summarizes the results of all the comparisons.

As previously described, the data were analyzed in three stages. The first stage compared the final grade average change scores of the combined experimental groups and the

two control groups with each other. The second stage compared the four experimental groups and the two control groups with each other in a series of multivariate single degree of freedom planned comparisons, and the third stage compared the various pairings of the four experimental groups with each other using multivariate single degree of freedom planned comparisons.

In order to insure that the results obtained were caused by the treatment procedures to which the groups were exposed rather than the effects of unequivalent groups, a multivariate analysis of variance of residuals was performed using the same program (Finn, 1972) to carry out a repeat of the series of single degree of freedom planned comparisons previously described. The residuals were obtained using multiple regression analysis procedures. Differences between the actual post-score and the predicted post-score in each case constitute the residuals. The residuals are analyzed in the same manner as any other scores, giving the effect of an analysis of covariance.

In addition to the planned comparisons of the change scores and of the residuals, Chi Square analyses of Passing-students/Failing-students were performed.

Table 11 lists the hypotheses, the dependent variables, and the type of analysis performed.

Hypothesis Testing

A univariate analysis of variance program was used to carry out the single degree of freedom planned comparisons that tested hypotheses one, two, and three. Multivariance was used to carry out the single degree of freedom planned comparisons that tested hypotheses three through fourteen.

Hypothesis 1. Hypothesis one states that the group made up of the combined experimental groups (E1+E2+E3+E4) will achieve significantly greater gains than the No-treatment Control group (C2) on final grade average (FGA).

The combined experimental group was significantly superior to the No-treatment Control group on FGA change scores as predicted ($p < 0.0123$). Table 12 lists the means and standard deviations, and Table 13 reports the results of the analysis of variance.

Hypothesis one was retained as tenable.

Hypothesis 2. Hypothesis two states that the group made up of the combined experimental groups (E1+E2+E3+E4) will

Table 11.

Summary of Hypotheses, Dependent Variables, and Type of Analysis

Hyp.	Groups	Dependent Variables			Analysis
		Analysis of FGA	Multivariate Analysis of Gain Scores	Multivariate Analysis of Residuals	
1	E1+E2+E3+E4 > C2	FGA	- -	- -	In a 1 X 3
2	E1+E2+E3+E4 > C1	FGA	- -	-	Anova
3	C1 > C2	FGA	-	-	
3	C1 > C2	-	FGA,DA,WM,RE.	FGA,DA,WM,RE,	
4	E1 > E2	-	FGA,DA,WM,RE.	FGA,DA,WM,RE.	
5	E1 > E3	-	FGA,DA,WM,RE.	FGA,DA,WM,RE.	
6	E1 > E4	-	FGA,DA,WM,RE.	FGA,DA,WM,RE.	
7	E1 > C1	-	FGA,DA,WM,RE.	FGA,DA,WM,RE.	
8	E1 > C2	-	FGA,DA,WM,RE.	FGA,DA,WM,RE.	In a 1 X 6
9	E2 > E4	-	FGA,DA,WM,RE.	FGA,DA,WM,RE.	Anova
10	E2 > C1	-	FGA,DA,WM,RE.	FGA,DA,WM,RE.	
11	E2 > C2	-	FGA,DA,WM,RE.	FGA,DA,WM,RE.	
12	E3 > E4	-	FGA,DA,WM,RE.	FGA,DA,WM,RE.	
13	E3 > C1	-	FGA,DA,WM,RE.	FGA,DA,WM,RE.	
14	E3 > C2	-	FGA,DA,WM,RE.	FGA,DA,WM,RE.	
15	E4 > C2	-	FGA,DA,WM,RE.	FGA,DA,WM,RE.	
16	E1+E2 > E3+E4	-	FGA,DA,WM,RE, HW,SCHED.	FGA,DA,WM,RE, HW, SCHED.	In a 2 X 2
17	E1+E3 > E2+E4	-	FGA,DA,WM,RE, HW, SCHED.	FGA,DA,WM,RE, HW, SCHED.	Anova

Key

Groups	Treatments
E1	ENG+PSYCH+CLG+CM
E2	ENG+PSYCH+CLG+BM
E3	ENG+PSYCH+AST+CM
E4	ENG+PSYCH+AST+BM
C1	ENG
C2	-

Dependent Variables Abbreviations	
FGA	: Final Grade Average
DA	: Delay Avoidance scale - SSHA
WM	: Work Methods scale - SSHA
RE	: Reading Efficiency measure - DRT
HW	: Average hours of study per week
SCHED	: Ratio of hours-studied-on-schedule to hours-of-study-scheduled

Table 12

Means and Standard Deviations Summary
Table for Final Grade Average
(E1+E2+E3+E4, C1, & C2)

Observed Cell Means

Group	FGA term I	FGA term II	FGA change
E1+E2+E3+E4	64.86825	66.86508	1.99683
C1	67.23571	68.05000	0.81429
*C2	64.37317	59.20976	-5.16341

Observed Cell Standard Deviations

E1+E2+E3+E4	14.50703	16.06000	12.85005
C1	13.86438	14.48602	7.06742
C2	9.78558	20.77970	17.10375

* Note. Means and standard deviations for group C2 on this table are for the entire No-treatment Control group. Other tables show means and standard deviations for those members of group C2 who returned for posttesting (C2-shows) only.

Table 13

Analysis of Variance Summary Table for
Final Grade Average Change Scores
(E1+E2+E3+E4, C1, & C2)

Source	df	M.S.	F	p
E1+E2+E3+E4 vs. C2				
FGA	1	1273,35	6.48	0.02
E1+E2+E3+E4 vs. C1				
FGA	1	16.02	0.08	0.78
C1 vs. C2				
FGA	1	372.92	1.90	0.17
Error				
FGA	115	196.56	-	-

achieve significantly greater gains than the Reading Control group (C1) on final grade average (FGA).

The combined experimental group was not significantly different from the Reading Control group on final grade average change scores. Table 12 lists the means and standard deviations, and Table 13 reports the results of the analysis of variance.

Hypothesis two was rejected.

Hypothesis 3. Hypothesis three states that the Reading Control group (C1) will achieve significantly greater gains than the No-treatment Control group (C2) on the dependent variables measured.

The univariate analysis of final grade average (FGA) means revealed no significant difference between the Reading Control group and the No-treatment Control group on FGA change scores. Table 12 lists the means and standard deviations, and Table 13 reports the results of the analysis of variance.

The multivariate analysis of gain scores showed that the Reading Control group achieved significantly greater gains than the No-treatment Control group ($p < 0.04$). Table 14

lists the means and standard deviations, and Table 15 reports the results of the analysis of variance of change scores.

The multivariate analysis of residuals on groups C1 and C2 was not performed. Residual data for C2 were not collected.

Hypothesis three was retained as tenable.

Hypothesis 4. Hypothesis four states that the group receiving Cognitive Modification plus Counselling (E1) will achieve significantly greater gains than the group receiving Behavior Modification plus Counselling (E2) on the dependent variables measured.

The multivariate analysis of gain scores showed that groups E1 achieved significantly greater gains than group E2 ($p < 0.02$). The multivariate analysis of residuals also showed group E1 to be significantly superior to group E2 ($p < 0.03$). Table 14 lists the means and standard deviations, and Table 16 reports the results of the analysis of variance of gain scores. Table 17 lists the means and standard deviations of the residuals, and Table 18 reports the results of the analysis of variance of the residuals.

Table 14

Means and Standard Deviations Summary Table
For FGA, DA, WM, and RE. (E1,E2,E3,E4,C1,C2)

Observed Cell Means

Grp.	FGA-pre	FGA-post	FGA-ch*	DA-pre	DA-post	DA-change
E1	70.96	74.82	3.86	16.66	23.33	6.66
E2	57.45	56.70	-0.75	14.25	15.50	1.25
E3	64.96	68.76	3.74	15.31	23.81	8.50
E4	66.47	67.72	1.25	12.94	16.87	3.93
C1	67.23	68.05	0.81	14.64	16.00	1.35
C2	69.95	69.21	-0.74	17.19	18.75	1.56

	WM-pre	WM-post	WM-ch*	RE-pre	RE-post	RE-change
E1	20.40	21.40	1.00	594.33	1435.48	841.13
E2	20.62	22.75	2.13	516.50	1035.56	519.06
E3	21.25	27.56	6.31	634.69	1234.06	599.38
E4	19.06	24.50	5.44	662.50	1204.13	541.63
C1	16.93	18.14	1.21	613.29	1048.29	435.00
C2	18.83	20.63	1.81	634.06	645.19	11.13

Observed Cell Standard Deviations

	FGA-pre	FGA-post	FGA-ch*	DA-pre	DA-post	DA-change
E1.	7.97	6.96	5.618	4.59	7.41	7.01
E2	19.85	23.97	14.237	6.05	8.93	8.14
E3	15.11	9.77	15.377	7.19	6.19	5.51
E4	9.45	13.13	14.128	5.90	7.20	8.77
C1	13.86	16.48	7.067	7.16	7.52	5.08
C2	7.51	15.60	12.80	6.66	5.62	6.86

	WM-pre	WM-post	WM-ch*	RE-pre	RE-post	RE-change
E1	4.82	6.05	6.47	126.31	597.76	601.45
E2	5.28	8.77	6.42	187.81	379.99	277.07
E3	4.73	7.14	9.00	259.14	543.05	371.97
E4	5.21	6.74	5.49	300.59	494.95	467.84
C1	6.02	7.00	4.68	162.15	261.02	272.07
C2	7.34	9.05	9.10	194.81	245.00	196.82

* ch = change

Table 15

Multivariate Analysis of Variance Summary Table for FGA, DA, WM, and RE Change Scores (C1 vs. C2)

Source	df	MS	F	p
Independent variables				
Multivariate	4		2.65	0.04
Univariate				
FGA	1	17.98	0.12	0.73
DA	1	0.31	0.01	0.94
WM	1	2.67	0.05	0.82
RE	1	1341533.12	8.90	0.01
Error				
Multivariate	84	-	-	-
Univariate				
FGA	87	150.91	-	-
DA	87	49.77	-	-
WM	87	50.52	-	-
RE	87	150779.35		

Table 16

Multivariate Analysis of Variance Summary Table for FGA, DA, WM, and RE Change Scores (E1 vs. E2)

Source	df	MS	F	p
Independent variables				
Multivariate	4	-	3.13	0.02
Univariate				
FGA	1	164.53	1.11	0.30
DA	1	227.15	4.51	0.04
WM	1	9.80	0.22	0.64
RE	1	3068.04	4.61	0.04
Error				
Multivariate	84	-	-	-
Univariate				
FGA	87	150.91	-	-
DA	87	49.77	-	-
WM	87	50.52	-	-
RE	87	150779.35	-	-

Table 17

Means and Standard Deviations Summary Table
For FGA, DA, WM, and RE Residuals

Observed Cell Means

Group	FGA(res)	DA(res)	WM(res)	RE(res)
E1	0.2087	0.3620	-0.2745	0.5244
E2	-0.2675	-0.4047	-0.1200	0.1384
E3	0.1177	0.5268	0.4475	0.0223
E4	-0.0167	-0.1338	0.2549	-0.0984
C1	-0.0333	-0.3745	-0.3715	-0.3168

Observed Cell Standard Deviations

E1	0.3075	0.8311	0.7780	1.2452
E2	0.9198	0.9662	0.8776	0.5707
E3	0.8016	0.5641	1.0744	0.7642
E4	0.8320	0.9451	0.7002	0.9713
C1	0.5075	0.6106	0.6124	0.5657

Table 18

Multivariate Analysis of Variance Summary Table for FGA, DA, WM, and RE Residuals (E1 vs. E2)

Source	df	MS	F	p
Independent variables				
Multivariate	4		4.51	0.003
Univariate				
FGA-res	1	1.76	3.38	0.07
DA-res	1	4.55	7.02	0.01
WM-res	1	0.18	0.27	0.61
RE-res	1	3.40	4.56	0.04
Error				
Multivariate	69	-	-	-
Univariate				
FGA-res	72	0.52	-	-
DA-res	72	0.65	-	-
WM-res	72	0.69	-	-
RE-res	72	0.75	-	-

Hypothesis four was retained as tenable.

Hypothesis 5. Hypothesis five states that the group receiving Cognitive Modification plus Counselling (E1) will achieve significantly greater gains than the group receiving Cognitive Modification plus Academic Skill Training (E3) on the dependent variables measured.

There was a significant difference between group E1 and group E3 in the multivariate analysis of gain scores ($p < 0.03$) and in the multivariate analysis of residuals ($p < 0.02$), but contrary to prediction, group E3 was significantly superior on work methods (WM), the only variable that was significantly different at the univariate level. Table 14 lists the means and standard deviations, and Table 19 reports the results of the analysis of variance of gain scores. Table 17 lists the means and standard deviations, and Table 20 reports the results of the analysis of variance of residuals.

Hypothesis five was rejected.

Hypothesis 6. Hypothesis six states that the group receiving Cognitive Modification plus Counselling (E1) will achieve significantly greater gains than the group receiving Behavior Modification plus Academic Skill Training (E4) on the dependent

Table 19

Multivariate Analysis of Variance Summary Table for FGA, DA, WM, and RE Change Scores (E1 vs. E3)

Source	df	MS	F	p
Independent variables				
Multivariate	4	-	2.88	0.03
Univariate				
FGA	1	0.10	0.01	0.98
DA	1	26.02	0.52	0.47
WM	1	218.50	4.99	0.03
RE	1	452493.61	2.60	0.11
Error				
Multivariate	84	-	-	-
Univariate				
FGA	87	150.91	-	-
DA	87	49.77	-	-
WM	87	50.52	-	-
RE	87	150779.35	-	-

Table 20

Multivariate Analysis of Variance Summary Table for FGA, DA, WM, and RE Residuals (E1 vs. E3)

Source	df	MS	F	p
Independent variables				
Multivariate	4	-	3.43	0.013
Univariate				
FGA-res	1	0.06	0.12	0.73
DA-res	1	0.21	0.32	0.57
WM-res	1	4.04	5.86	0.02
RE-res	1	1.95	2.62	0.11
Error				
Multivariate	69	-	-	-
Univariate				
FGA-res	72	0.52	-	-
DA-res	72	0.65	-	-
WM-res	72	0.69	-	-
RE-res	72	0.75	-	-

variables measured.

The multivariate analysis of gain scores showed that group E1 was significantly superior to group E4 ($p < 0.01$), as did the multivariate analysis of residuals ($p < 0.01$). Table 14 lists the means and standard deviations, and Table 21 reports the results of the analysis of variance of gain scores. Table 17 lists the means and standard deviations, and Table 22 reports the results of the analysis of variance of residuals.

Hypothesis six was retained as tenable.

Hypothesis 7. Hypothesis seven states that the group receiving Cognitive Modification plus Counselling (E1) will achieve significantly greater gains than the Reading Control group (C1) on the dependent variables measured.

The multivariate analysis of gain scores showed that group E1 was significantly superior to group C1 ($p < 0.03$), as did the multivariate analysis of residuals ($p < 0.03$). Table 14 lists the means and standard deviations, and Table 23 reports the results of the analysis of variance of gain scores. Table 17 lists the means and standard deviations, and Table 24 reports the results of the analysis of variance of

Table 21

Multivariate Analysis of Variance Summary Table for FGA, DA, WM, and RE Change Scores (E1 vs. E4)

Source	df	MS	F	p
Independent variables				
Multivariate	4	-	3.85	0.007
Univariate				
FGA	1	52.74	0.36	0.55
DA	1	57.66	1.15	0.29
WM	1	152.45	3.48	0.07
RE	1	694492.19	3.99	0.05
Error				
Multivariate	84	-	-	-
Univariate				
FGA	87	150.91	-	-
DA	87	49.77	-	-
WM	87	50.52	-	-
RE	87	150779.35	-	-

Table 22

Multivariate Analysis of Variance Summary Table for FGA, DA, WM, and RE Residuals (E1 vs. E4)

Source	df	MS	F	p
Independent variables				
Multivariate	4	-	4.77	0.002
Univariate				
FGA	1	0.39	0.76	0.39
DA	1	1.90	2.93	0.09
WM	1	2.17	3.15	0.08
RE	1	3.00	4.03	0.05
Error				
Multivariate	69	-	-	-
Univariate				
FGA-res	72	0.52	-	-
DA-res	72	0.65	-	-
WM-res	72	0.69	-	-
RE-res	72	0.75	-	-

Table 23

Multivariate Analysis of Variance Summary Table for FGA, DA, WM, and RE Change Scores (E1 vs. C1)

Source	df	MS	F	p
Independent variables				
Multivariate	4	-	2.94	0.03
Univariate				
FGA	1	67.17	0.45	0.50
DA	1	204.14	4.06	0.05
WM	1	0.33	0.01	0.93
RE	1	1194424.13	6.86	0.01
Error				
Multivariate	84	-	-	-
Univariate				
FGA	87	150.91	-	-
DA	87	49.77	-	-
WM	87	50.52	-	-
RE	87	150779.35	-	-

Table 24

Multivariate Analysis of Variance Summary Table for FGA, DA, WM, and RE Residuals (E1 vs. C1)

Source	df	MS	F	p
Independent variables				
Multivariate	4	-	3.04	0.02
Univariate				
FGA-res	1	0.42	0.82	0.37
DA-res	1	3.93	6.06	0.02
WM-res	1	0.07	0.10	0.76
RE-res	1	5.12	6.87	0.01
Error				
Multivariate	69	-	-	-
Univariate				
FGA-res	72	0.52	-	-
DA-res	72	0.65	-	-
WM-res	72	0.69	-	-
RE-res	72	0.75	-	-

residuals.

Hypothesis seven was retained as tenable.

Hypothesis 8. Hypothesis eight states that the group receiving Cognitive Modification plus Counselling (E1) will achieve significantly greater gains than the No-treatment Control group (C2) on the dependent variables measured.

The multivariate analysis of gain scores showed that group E1 achieved significantly greater gains than group C2 ($p < 0.001$). The multivariate analysis of residuals between these two groups was not performed. Table 14 lists the means and standard deviations, and Table 25 reports the results of the analysis of variance of gain scores.

Hypothesis eight was retained as tenable.

Hypothesis 9. Hypothesis nine states that the group receiving Behavior Modification plus Counselling (E2) will achieve significantly greater gains than the group receiving Behavior Modification plus Academic Skill Training (E4) on the dependent variables measured.

There was no significant difference between group E2 and group E4. Table 14 lists the means and standard deviations,

Table 25

Multivariate Analysis of Variance Summary Table for FGA, DA, WM, and RE Change Scores (E1 vs. C2)

Source	df	MS	F	p
Independent variables				
Multivariate	4	-	10.24	0.0001
Univariate				
FGA	1	163.64	1.08	0.30
DA	1	201.70	4.05	0.05
WM	1	5.11	0.10	0.75
RE	1	5333526.45	35.37	0.0001
Error				
Multivariate	84	-	-	-
Univariate				
FGA	87	150.91	-	-
DA	87	49.77	-	-
WM	87	50.52	-	-
RE	87	150779.35	-	-

Table 26

Multivariate Analysis of Variance Summary Table for FGA, DA, WM, and RE Residuals (E2 vs. E3)

Source	df	MS	F	p
Independent variables				
Multivariate	4	-	2.96	0.03
Univariate				
FGA-res	1	1.19	2.29	0.14
DA-res	1	6.94	10.70	0.002
WM-res	1	2.58	3.74	0.06
RE-res	1	0.21	0.28	0.60
Error				
Multivariate	69	-	-	-
Univariate				
FGA-res	72	0.52	-	-
DA-res	72	0.65	-	-
WM-res	72	0.69	-	-
RE-res	72	0.75	-	-

and Table 27 reports the results of the analysis of variance of gain scores. Table 17 lists the means and standard deviations, and Table 28 reports the results of the analysis of residuals.

Hypothesis nine was rejected.

Hypothesis 10. Hypothesis ten states that the group receiving Behavior Modification plus Counselling (E2) will achieve significantly greater gains than the Reading Control group (C1) on the dependent variables measured.

There was no significant difference between group E2 and group C1. Table 14 lists the means and standard deviations, and Table 29 reports the results of the analysis of variance of gain scores. Table 17 lists the means and standard deviations, and Table 30 reports the results of the analysis of residuals.

Hypothesis ten was rejected.

Hypothesis 11. Hypothesis eleven states that the group receiving Behavior Modification plus Counselling (E2) will achieve significantly greater gains than the No-treatment Control group (C2) on the dependent variables measured.

Table 27

Multivariate Analysis of Variance Summary Table for FGA, DA, WM, and RE Change Scores (E2 vs. E4)

Source	df	MS	F	p
Independent variables				
Multivariate	4	-	0.58	0.68
Univariate				
FGA	1	32.00	0.22	0.64
DA	1	57.78	1.15	0.29
WM	1	87.78	2.00	0.16
RE	1	4072.53	0.02	0.88
Error				
Multivariate	84	-	-	-
Univariate				
FGA	87	150.91	-	-
DA	87	49.77	-	-
WM	87	50.52	-	-
RE	87	150779.35	-	-

Table 28

Multivariate Analysis of Variance Summary Table for FGA, DA, WM, and RE Residuals (E2 vs. E4)

Source	df	MS	F	p
Independent variables				
Multivariate	4	-	0.58	0.68
Univariate				
FGA-res	1	0.50	0.97	0.33
DA-res	1	0.59	0.91	0.34
WM-res	1	1.12	1.63	0.21
RE-res	1	0.01	0.02	0.90
Error				
Multivariate	69	-	-	-
Univariate				
FGA-res	72	0.52	-	-
DA-res	72	0.65	-	-
WM-res	72	0.69	-	-
RE-res	72	0.75	-	-

Table 29

Multivariate Analysis of Variance Summary Table for FGA, DA, WM, and RE Change Scores (E2 vs. C1)

Source	df	MS	F	p
Independent variables				
Multivariate	4	-	0.15	0.96
Univariate				
FGA	1	18.27	0.12	0.73
DA	1	0.08	0.01	0.97
WM	1	6.19	0.14	0.71
RE	1	52763.23	0.30	0.58
Error				
Multivariate	4	-	-	-
Univariate				
FGA	87	150.91	-	-
DA	87	49.77	-	-
WM	87	50.52	-	-
RE	87	150779.35	-	-

Table 30

Multivariate Analysis of Variance Summary Table for FGA, DA, WM, and RE Residuals (E2 vs. C1)

Source	df	MS	F	p
Independent variables				
Multivariate	4	-	0.60	0.67
Univariate				
FGA-res	1	0.41	0.79	0.38
DA-res	1	0.01	0.01	0.92
WM-res	1	0.47	0.69	0.41
RE-res	1	0.24	0.32	0.57
Error				
Multivariate	69	-	-	-
Univariate				
FGA-res	72	0.52	-	-
DA-res	72	0.65	-	-
WM-res	72	0.69	-	-
RE-res	72	0.75	-	-

Group E2 achieved significantly greater gains than group C2 on the multivariate comparison of gain scores ($p < 0.01$). The multivariate comparison of residuals between these two groups was not performed. Table 14 list the means and standard deviations, and Table 31 reports the results of the analysis of variance of gain scores.

Hypothesis eleven was retained as tenable.

Hypothesis 12. Hypothesis twelve states that the group receiving Cognitive Modification plus Academic Skill Training (E3) will achieve significantly greater gains than the group receiving Behavior Modification plus Academic Skill Training (E4) on the dependent variables measured.

There was no significant difference between group E3 and group E4. Table 14 lists the means and standard deviations, and Table 32 reports the results of the analysis of variance of gain scores. Table 17 lists the means and standard deviations, and Table 33 reports the results of the analysis of variance of residuals.

Hypothesis twelve was rejected.

Hypothesis 13. Hypothesis thirteen states that the group

Table 31

Multivariate Analysis of Variance Summary Table for FGA, DA, WM, and RE Change Scores (E2 vs. C2)

Source	df	MS	F	p
Independent variables				
Multivariate	4	-	3.83	0.01
Univariate				
FGA	1	0.01	0.00	0.99
DA	1	0.78	0.02	0.90
WM	1	0.78	0.02	0.90
RE	1	2064004.03	13.69	0.001
Error				
Multivariate	84	-	-	-
Univariate				
FGA	87	150.91	-	-
DA	87	49.77	-	-
WM	87	50.52	-	-
RE	87	150779.35	-	-

Table 32

Multivariate Analysis of Variance Summary Table for FGA, DA, WM, and RE Change Scores (E3 vs. E4)

Source	df	MS	F	p
Independent variables				
Multivariate	4	-	0.93	0.45
Univariate				
FGA	1	49.75	0.34	0.56
DA	1	166.53	3.31	0.07
WM	1	6.13	0.14	0.71
RE	1	21680.50	0.15	0.70
Error				
Multivariate	84	-	-	-
Univariate				
FGA	87	150.91	-	-
DA	87	49.77	-	-
WM	87	50.52	-	-
RE	87	150779.35	-	-

Table 33

Multivariate Analysis of Variance Summary Table for FGA, DA, WM, and RE Residuals (E3 vs. E4)`

Source	df	MS	F	p
Independent variables				
Multivariate	4	-	1.47	0.22
Univariate				
FGA-res	1	0.14	0.28	0.60
DA-res	1	3.49	5.38	0.02
WM-res	1	0.30	0.43	0.51
RE-res	1	0.12	0.16	0.69
Error				
Multivariate	69	-	-	-
Univariate				
FGA-res	72	0.52	-	-
DA-res	72	0.65	-	-
WM-res	72	0.69	-	-
RE-res	72	0.75	-	-

receiving Cognitive Modification plus Counselling (E3) will achieve significantly greater gains than the Reading Control group (C1) on the dependent variables measured.

The multivariate analysis of gain scores showed no significant difference between group E3 and group C1, but the multivariate analysis of residuals showed that group E3 was significantly superior to group C1 ($p < 0.05$). Table 14 lists the means and standard deviations, and Table 34 reports the results of the analysis of variance of gain scores. Table 17 lists the means and standard deviations, and Table 35 reports the results of the analysis of variance of residuals.

Hypothesis thirteen was retained as tenable.

Hypothesis 14. Hypothesis fourteen states that the group receiving Cognitive Modification plus Academic Skill Training (E3) will achieve significantly greater gains than the No-treatment Control group (C2) on the dependent variables measured.

The multivariate analysis of gain scores showed that group E3 achieved significantly greater gains than group C2 ($p < 0.001$). The multivariate analysis of residuals between these two groups was not performed. Table 14 lists the

Table 34

Multivariate Analysis of Variance Summary Table for FGA, DA, WM, and RE Change Scores (E3 vs. C1)

Source	df	MS	F	p
Independent variables				
Multivariate	4	-	1.99	0.11
Univariate				
FGA	1	64.08	0.43	0.51
DA	1	380.95	7.57	0.01
WM	1	194.07	4.43	0.04
RE	1	201742.92	1.16	0.29
Error				
Multivariate	84	-	-	-
Univariate				
FGA	87	150.91	-	-
DA	87	49.77	-	-
WM	87	50.52	-	-
RE	87	150779.35	-	-

Table 35

Multivariate Analysis of Variance Summary Table for FGA, DA, WM, and RE Residuals (E3 vs. C1)

Source	df	MS	F	p
Independent variables				
Multivariate	4	-	2.63	0.04
Univariate				
FGA-res	1	0.17	0.33	0.57
DA-res	1	6.07	9.35	0.01
WM-res	1	5.00	7.27	0.01
RE-res	1	0.86	1.15	0.29
Error				
Multivariate	69	-	-	-
Univariate				
FGA-res	72	0.52	-	-
DA-res	72	0.65	-	-
WM-res	72	0.69	-	-
RE-res	72	0.75	-	-

means and standard deviations, and Table 36 reports the results of the analysis of variance of gain scores.

Hypothesis fourteen was retained as tenable.

Hypothesis 15. Hypothesis fifteen states that the group receiving Behavior Modification plus Academic Skill Training (E4) will achieve significantly greater gains than the No-treatment Control group (C2) on the dependent variables measured.

The multivariate analysis of gain scores showed that group E4 achieved significantly greater gains than group C2 ($p < 0.01$). The multivariate analysis of residuals between these two groups was not performed. Table 14 lists the means and standard deviations, and Table 37 reports the results of the analysis of variance of gain scores.

Hypothesis fifteen was retained as tenable

Hypothesis 16. Hypothesis sixteen states that there will be a main effects Counselling/Academic-Skill-Training. The group made up of the two groups receiving the Counselling treatment (E1+E2) will achieve significantly greater gains than the group made up of the two groups receiving the Academic Skill Training treatment (E3+E4) on the dependent variables measured.

Table 36

Multivariate Analysis of Variance Summary Table for FGA, DA, WM, and RE Change Scores (E3 vs. C2)

Source	df	MS	F	p
Independent variables				
Multivariate	4	-	5.13	0.001
Univariate				
FGA	1	160.65	1.06	0.31
DA	1	385.03	7.74	0.01
WM	1	162.00	3.21	0.08
RE	1	2768304.50	18.36	0.0001
Error				
Multivariate	84	-	-	-
Univariate				
FGA	87	150.91	-	-
DA	87	49.77	-	-
WM	87	50.52	-	-
RE	87	150799.35	-	-

Table 37

Multivariate Analysis of Variance Summary Table for FGA, DA, WM, and RE Change Scores (E4 vs. C2)

Source	df	MS	F	p
Independent variables				
Multivariate	4	-	3.66	0.01
Univariate				
FGA	1	31.60	0.21	0.65
DA	1	45.13	0.91	0.34
WM	1	105,13	2.08	0.15
RE	1	2251442.00	14.93	0.001
Error				
Multivariate	84	-	-	-
Univariate				
FGA	87	150.91	-	-
DA	87	49.77	-	-
WM	87	50.52	-	-
RE	87	150779.35	-	-

There was no significant interaction effect at either the multivariate or the univariate level, so the CLG/AST main effect can be discussed without reference to the CM/BM main effect. Contrary to prediction, the group receiving the Academic Skill Training treatment (E3+E4) was significantly superior to the group receiving the Counselling treatment (E1+E2) in both the multivariate analysis of gain scores ($p < 0.05$), and the multivariate analysis of residuals ($p < 0.03$). Table 38 lists the combined group means and overall means, Table 39 lists the means and standard deviations, and Table 40 reports the results of the analysis of variance of gain scores. Table 41 lists the combined means and overall means, and the group means and standard deviations, and Table 42 reports the results of the analysis of variance of residuals.

Hypothesis sixteen was rejected.

Hypothesis 17. Hypothesis seventeen states that there will be a main effects Cognitive-Modification/Behavior-Modification. The group made up of the two groups receiving the Cognitive Modification treatment (E1+E3) will achieve significantly greater gains than the group made up of the two groups receiving the Behavior Modification treatment (E2+E4) on the dependent variables measured.

Table 38

Combined Group Means, and Overall Means Summary Table
For FGA, DA, WM, RE, HW, and SCHED.
(E1+E2, E3+E4, E1+E3, E2+E4)

	Factor CLG-AST		Factor CM-BM		Overall Mean
Variable	E1+E2	E3+E4	E1+E3	E2+E4	
FGA-I	63.55	65.44	67.94	61.05	64.49
FGA-II	64.86	68.11	71.77	61.20	66.48
FGA-change	1.31	2.67	3.83	0.15	1.99
DA-pre	15.27	13.50	15.73	13.03	14.38
DA-post	20.00	23.53	23.53	15.73	19.63
DA-change	4.00	6.50	7.80	2.70	5.25
WM-pre	20.40	19.73	20.47	19.67	20.07
WM-post	22.00	26.23	24.60	23.63	24.12
WM-change	1.60	6.50	4.13	3.97	4.05
RE-pre	554.85	654.80	614.90	594.70	604.80
RE-post	1227.00	1214.00	1333.00	1108.00	1220.00
RE-change	672.15	559.20	717.80	513.50	615.70
HW-pre	8.74	6.70	8.92	6.52	7.72
HW-post	10.54	7.68	11.48	6.74	9.11
HW-change	1.80	0.98	2.56	0.22	1.39
SCHED	0.52	0.42	0.53	0.41	0.47

Table 39

Means and Standard Deviations Summary Table for
FGA, DA, WM, RE, HW, and SCHED (E1,E2,E3,E4)

Observed Cell Means

Grp	FGA-I	FGA-II	FGA-ch	DApre	DApost	DA-ch	WM pre	WMpost	WMchange
E1	70.967	74.827	3.860	16.667	23.333	6.667	20.400	21.400	1.000
E2	56.127	54.893	-1.233	13.867	15.200	1.333	20.400	22.600	2.200
E3	64.907	68.707	3.800	14.800	23.733	8.933	20.533	27.800	7.267
E4	65.973	67.507	1.533	12.200	16.267	4.067	18.933	24.667	5.733
	REpre	REpost	RE-ch	HWpre	HWpost	HW-ch	SCHED		
E1	594.33	1435.46	841.13	10.920	13.760	2.840	0.619		
E2	515.20	1018.20	503.00	6.567	7.327	0.760	0.429		
E3	635.40	1229.93	594.53	6.920	9.200	2.280	0.431		
E4	674.26	1198.26	524.00	6.480	6.160	-0.320	0.402		

Observed Cell Standard Deviations

	FGA-1	FGA-2	FGA-ch	DApre	DApost	DA	WMpre	WMpost	WM change
E1	7.972	6.962	5.618	4.593	7.413	7.006	4.822	6.045	6.469
E2	19.808	23.665	14.599	6.057	9.158	8.414	5.382	9.053	6.635
E3	15.639	10.114	15.915	7.133	6.3972	5.417	3.888	7.321	8.430
E4	9.561	13.561	14.576	5.294	7.015	9.059	5.364	6.945	5.548
	REpre	REpost	RE-ch	HWpre	HWpost	HW-ch	SCHED		
E1	126.30	597.76	601.45	10.294	9.450	3.530	0.1902		
E2	194.32	386.70	278.97	5.804	6.078	5.029	0.3627		
E3	268.21	561.84	384.50	6.916	8.504	4.190	0.2835		
E4	307.30	511.74	478.72	4.086	4.564	3.371	0.2991		

Table 40

Multivariate Analysis of Variance Summary Table for FGA, DA, WM, RE, HW, and SCHED Change Scores Counselling vs. Academic Skill Training (E1+E2 vs. E3+E4)

Source	df	MS	F	p
Independent variables				
Multivariate	6	2.20	2.20	0.04
Univariate	1			
FGA	1	27.47	0.15	0.70
DA	1	93.75	1.62	0.21
WM	1	360.15	7.67	0.01
RE	1	190857.60	0.93	0.34
HW	1	10.09	0.61	0.44
SCHED	1	0.17	2.07	0.16
Error				
Multivariate	51	-	-	-
Univariate				
FGA	56	177.62	-	-
DA	56	57.83	-	-
WM	56	46.93	-	-
RE	56	204149.48	-	-
HW	56	16.67	-	-
SCHED	56	0.08	-	-

Table 41

Means and Standard Deviations, Combined Group Means, and Overall Means Summary Table FGA, DA, WM, and RE Residuals

Observed Cell Means

Group	FGA(res)	DA(res)	WM(res)	RE(res)
E1	0.2087	0.3620	-0.2745	0.5244
E2	-0.3161	-0.4112	-0.1183	-0.1716
E3	0.1204	0.5573	0.5459	0.0123
E4	-0.0061	-0.1502	0.2888	-0.1354

Observed Cell Standard Deviations

E1	0.3075	0.8311	0.7780	1.2452
E2	0.9305	0.9997	0.9084	0.5745
E3	0.8297	0.5701	1.0348	0.7899
E4	0.8601	0.9759	0.7110	0.9936

Combined Group Means

E1+E2	-0.0537	-0.0246	-0.1964	0.1764
E3+E4	0.0572	0.2036	-0.4173	-0.0616
E1+E3	0.1646	0.4597	0.1357	0.2684
E2+E4	-0.1611	-0.2807	0.0852	-0.1535

Overall Means

	0.0017	0.0895	0.1104	0.0574

Table 42

Multivariate Analysis of Variance Summary Table for Residual Scores on FGA, DA, WM, and RE Counselling vs. Academic Skill Training (E1+E2 vs. E3+E4)

Source	df	MS	F	p
Independent variables				
Multivariate	4	-	3.04	0.03
Univariate				
FGA-res	1	0.18	0.31	0.58
DA-res	1	0.78	1.05	0.31
WM-res	1	5.65	7.52	0.01
RE-res	1	0.85	0.97	0.33
Error				
Multivariate	53	-	-	-
Univariate				
FGA-res	56	0.60	-	-
DA-res	56	0.74	-	-
WM-res	56	0.75	-	-
RE-res	56	0.87	-	-

As previously stated, there was no interaction effect, so the CM/BM main effect can be discussed without reference to the CLG/AST main effect. As predicted, the group receiving the Cognitive Modification treatment (E1+E3) was significantly superior to the group receiving the Behavior Modification treatment (E2+E4) in both the multivariate analysis of gain scores ($p < 0.03$), and the multivariate analysis of residuals ($p < 0.01$). Table 38 lists the combined group means and overall means, Table 39 lists the means and standard deviations, and Table 43 reports the results of the analysis of variance of gain scores. Table 41 lists the combined group means and overall means, and the means and standard deviations, while Table 44 reports the results of the analysis of variance of residuals.

Hypothesis seventeen was retained as tenable.

Summary

Of the 17 research hypotheses, 11 were retained as tenable (1, 3, 4, 6, 7, 8, 11, 13, 14, 15, and 17), four were rejected (2, 9, 10, and 12) because no significant differences were revealed by any of the analyses, and two were rejected (5 and 16) because the results of the analyses revealed significant differences in the direction opposite to that predicted. These findings will be discussed in chapter VI.

Table 43

Multivariate Analysis of Variance Summary Table for FGA, DA, WM, RE, HW, and SCHED Change Scores Cognitive Modification vs. Behavior Modification (E1+E3 vs. E2+E4)

Source	df	MS	F	p
Independent variables				
Multivariate	6	-	2.72	0.03
Univariate				
FGA	1	203.14	1.14	0.29
DA	1	390.15	6.75	0.02
WM	1	0.42	0.01	0.93
RE	1	626281.67	3.07	0.09
HW	1	82.13	4.93	0.03
SCHED	1	0.18	2.15	0.15
Error				
Multivariate	51	-	-	-
Univariate				
FGA	56	177.62	-	-
DA	56	57.83	-	-
WM	56	46.93	-	-
RE	56	204149.48	-	-
HW	56	16.67	-	-
SCHED	56	0.08	-	-

Table 44

Multivariate Analysis of Variance Summary Table for Residual Scores on EGA, DA, WM, and RE Cognitive Modification vs. Behavior Modification (E1+E3 vs. E2+E4)

Source	df	MS	F	p
Independent variables				
Multivariate	4	-	3.97	0.01
Univariate				
FGA-res	1	1.59	2.66	0.11
DA-res	1	8.22	11.08	0.002
WM-res	1	0.04	0.05	0.82
RE-res	1	2.67	3.06	0.09
Error				
Multivariate	53	-	-	-
Univariate				
FGA-res	56	0.60	-	-
DA-res	56	0.74	-	-
WM-res	56	0.75	-	-
RE-res	56	0.87	-	-

Other Analyses

Follow-up: dropouts and failing students. A term III and a term IV follow-up had been originally planned, but follow-up data could not be obtained on a large proportion (32 percent) of the subjects because they had left the college before completing the four semesters covered by the study. An examination of the dropout data revealed that the number and "type" (see below) of students who had left the college were distributed unequally over the various treatment groups (see table 45). It was judged that the persistors could not be treated as though they were representative of the original pool of subjects.

To examine these data, four mutually exclusive groups of students were identified: Passing Students, Failing Students, Dropouts, and Transfer-outs, defined as follows:

1. Passing Students were defined as students who had completed four consecutive semesters and had achieved an overall final grade average for the four semesters of sixty percent or more (the official college pass mark is sixty percent).

2. Failing Students were defined as students who had completed four consecutive semesters, but who had recorded

Table 45

Distribution of Types of Students Over Groups

Group	Pretreatment N	Ineligible	Did not enter Program	Withdrew from program (did not drop out)	Dropped out in Term II	Dropped out in Term III or IV	Transferred out	Passing average Four terms	Failing average Four terms	Posttesting N
E1	18	1	1	1	-	-	2	13	-	15
E2	18	-	1	-	1	4	1	8	3	16
E3	18	-	-	-	2	2	2	10	2	16
E4	18	-	1	-	1	1	3	12	-	16
C1	18	1	-	2	1	1	1	8	3	14
C2	43	-	-	-	2	8	8	18	7	41
(C2 -shows)		-	-	-	-	(1)	(4)	(11)	-	(16)

an overall final grade average for the four semesters of less than sixty percent.

3. Dropouts were defined as students who had left the college before completing four consecutive semesters, and (a) who had a final grade average in the term or terms immediately prior to their departure that was less than sixty percent, or (b) who had failed half or more of the courses in which they were registered in the term or terms immediately prior to their departure.

4. Transfer-outs were defined as students who had left the college before completing four consecutive semesters, but (a) had recorded a final grade average in the term or terms immediately prior to their departure of sixty percent or higher, and (b) had passed more than half of the courses in which they were registered in the term or terms immediately prior to their departure. The term "Transfer-outs" was chosen because it was assumed that these students, following a practice quite common at John Abbott College, had taken advantage of the difference between the education system in Québec and those in other parts of Canada, and had transferred to universities outside of Québec in order to exercise their option of commencing university after only one year of CEGEP. Support for assumptions of this nature is found in Dalton, Anastasiow and Bridgeman (1977), and

Timmons (1977).

For the purpose of the following analyses, it was assumed that Transfer-outs would have continued to achieve passing final grade averages in terms III and IV had they remained at John Abbott College, and that Dropouts would have continued to record failing final grade averages had they remained. Transfer-outs were therefore grouped with Passing Students, and Dropouts with Failing Students.

Chi square analysis: Passing Students vs. Failing Students. A 2 X 6 Chi Square analysis (Passing-students/Failing-students) was performed using the formula provided by Guilford (1965, p. 240), and using the criteria described above for distinguishing between Passing Students and Failing Students. A significant difference ($p < 0.02$) was revealed. Table 46 summarizes the contingency table and the results of the 2 X 6 Chi Square analysis.

In order to more accurately identify the source of the significant difference described in the preceding paragraph, fifteen 2 X 2 Chi Square analyses (Passing Students/Failing Students) were performed comparing each of the six groups, E1, E2, E3, E4, C1, and C2, with each other. The same criteria

for distinguishing between Passing Students and Failing Students was used, and the Yates Correction for Continuity was used where appropriate (Guilford, 1965). The group receiving Cognitive Modification plus Counselling (E1) had a significantly superior ratio of Passing Students to Failing Students compared to each of groups E2 ($p < 0.01$), E3 ($p < 0.05$), C1 ($p < 0.05$), and C2 ($p < 0.02$). Group E1 had a non-significantly superior ratio compared to the remaining group, E4. There were no other significant differences between any of the other pairs of groups. Table 46 summarizes the contingency tables and the results of the 2 X 2 Chi Square analyses.

In order to establish whether any of the groups were significantly different on the Passing Student/Failing Student measure prior to treatment, the pretreatment (term I) final grade averages were examined in a 2 X 6 Chi Square analysis and fifteen 2 X 2 Chi square analyses in the same manner as described above. A significant difference in the 2 X 6 Chi Square analysis was revealed ($p < 0.05$). In the 2 X 2 analyses, group E1 was found to be significantly superior to group E2 ($p < 0.01$). There were no other significant differences between any of the other pairs of groups. Table 47 summarizes the contingency tables and reports the results of the Chi Square analyses.

Table 46

Chi Square Analysis and Contingency Summary Table: Passing Students/Failing Students X Groups Over Terms I to IV

Contingency Table - Terms I to IV

	E1	E2	E3	E4	C1	C2
Passing Students	15	9	12	15	10	26
Failing Students	0	8	6	2	5	17

2 X 6 Chi Square Analysis

Chi Square = 13.41	df = 5	$p < 0.02$*

2 X 2 Chi Square Analyses df = 1

	E2	E3	E4	C1	C2
E1 vs.	$Chi^2 = 7.07$ $p < 0.01$**	$Chi^2 = 3.98$ $p < 0.05$*	$Chi^2 = 0.42$ $p < 0.70$	$Chi^2 = 3.84$ $p < 0.05$*	$Chi^2 = 6.60$ $p < 0.02$*
E2 vs.	*	$Chi^2 = 0.24$ $p < 0.70$	$Chi^2 = 3.54$ $p < 0.10$	$Chi^2 = 0.19$ $p < 0.70$	$Chi^2 = 0.06$ $p < 0.90$
E3 vs.	*	*	$Chi^2 = 1.28$ $p < 0.30$	$Chi^2 = 0.001$ $p < 0.99$	$Chi^2 = 0.02$ $p < 0.90$
E4 vs.	*	*	*	$Chi^2 = 1.06$ $p < 0.40$	$Chi^2 = 3.20$ $p < 0.10$
C1 vs.	*	*	*	*	$Chi^2 = 0.02$ $p < 0.90$

Table 47

Chi Square Analysis and Contingency Summary Table: Passing Students/Failing Students X Groups. (Term I - Pre-treatment)

Contingency Table - Term I - Pre-treatment

	E1	E2	E3	E4	C1	C2
Passing Students	14	7	14	13	12	28
Failing Students	1	10	4	4	3	15

2 X 6 Chi Square Analysis

Chi Square = 12.76	df = 5	p 0.05

2 X 2 Chi Square Analyses df = 1

	E2	E3	E4	C1	C2
E1 vs.	$Chi^2 = 7.44$ $p < 0.01$	$Chi^2 = 0.63$ $p < 0.50$	$Chi^2 = 0.28$ $p < 0.70$	$Chi^2 = 0.18$ $p < 0.70$	$Chi^2 = 3.13$ $p < 0.10$
E2 vs.	*	$Chi^2 = 1.84$ $p < 0.20$	$Chi^2 = 1.45$ $p < 0.30$	$Chi^2 = 3.52$ $p < 0.10$	$Chi^2 = 0.36$ $p < 0.70$
E3 vs.	*	*	$Chi^2 = 0.01$ $p < 0.95$	$Chi^2 = 0.03$ $p < 0.90$	$Chi^2 = 0.81$ $p < 0.50$
E4 vs	*	*	*	$Chi^2 = 0.03$ $p < 0.90$	$Chi^2 = 1.21$ $p < 0.30$
C1 vs.	*	*	*		$Chi^2 = 0.72$ $p < 0.50$

No-treatment control group: "shows" vs. "no-shows." Only 16 of 41 subjects in the No-treatment Control group (C2) returned for posttesting. In order to establish whether the data collected on those who showed up was representative of the entire No-treatment Control group, a single degree of freedom comparison was performed to test for significant difference on final grade average (FGA), which was the only dependent variable on which data were available for the entire group. Table 48 summarizes the means and standard deviations, and table 49 summarizes the results of the analysis of variance.

The sixteen subjects who returned for posttesting (the "shows") were significantly superior to the twenty-five subjects who did not return for posttesting (the "no-shows") on pretreatment FGA ($p < 0.003$) and posttreatment FGA ($p < 0.02$), and were non-significantly superior on FGA change ($p < 0.20$).

Analysis of final grade average. The significant pre- and posttreatment differences between the No-treatment Control group "shows" and the "no-shows" cast doubt on the probability that the "shows" truly represented the total No-treatment Control group. A series of single degree of freedom comparisons was performed, using the Finn (1972) program previously described, comparing the total No-treat-

Table 48

Means and Standard Deviations Summary Table for FGA
(C2-shows vs. C2-no-shows)

Observed Cell Means

	FGA-I	FGA-II	FGA-Change
C2-shows	69.95	69.21	-0.74
C2-no-shows	60.80	52.81	-7.99

Observed Cell Standard Deviations

C2-shows	7.51	15.60	12.80
C2-no-shows	9.51	21.40	19.07

Table 49

Analysis of Variance Summary Table for FGA
(C2-shows vs. C2-no-shows)

Source	df	MS	F	p
Independent variables				
FGA-I	1	816.09	10.56	0.01
FGA-II	1	2625.44	6.99	0.02
FGA-Change	1	514.01	1.79	0.19
Error				
FGA-I	39	77.29	-	-
FGA-II	39	375.55	-	-
FGA-Change	39	286.86	-	-

ment Control group and the other five groups with each other. Table 50 summarizes the means and standard deviations, and table 51 summarizes the results of the analysis of variance of FGA gain scores. Group E1 ($p < 0.03$) and group E3 ($p < 0.03$) were significantly superior to the total No-treatment Control group (C2-total). There were no other significant between group differences.

Summary

The group made up of the combination of the four experimental groups (E1+E2+E3+E4) was superior to the No-treatment Control group (C2) on final grade average change.

Each of the experimental groups (E1, E2, E3, and E4) and the Reading Control group (C2) were superior to those members of the No-treatment Control group who returned for posttesting (C2-shows); however in some cases, the superiority seemed limited to gains in reading efficiency scores (RE).

The two groups that received the Cognitive Modification treatment procedure (E1, E3), although significantly different at the multivariate level, were approximately equal to each other. Each was superior to the other on different variables.

Table 50

Means and Standard Deviations Summmary
Table for Final Grade Average
(E1,E2,E3,E4,C1,C2)

Observed Cell Means

Group	FGA term I	FGA term II	FGA change
E1	70.967	74.827	3.860
E2	57.450	56.700	-0.750
E3	64.963	68.706	3.744
E4	66.475	67.725	1.250
C1	67.236	68.050	0.814
C2	64.373	59.209	-5.163

Observed Cell Standard Deviations

E1	7.971	6.963	5.618
E2	19.855	23.978	14.237
E3	15.111	9.771	15.377
E4	9.452	13.131	14.128
C1	13.864	16.486	7.067
C2	9.785	20.780	17.104

Table 51

Analysis of Variance Summary Table for FGA Change Scores (E1,E2,E3,E4,C1,C2)

Comparison	Source	df	MS	F	pp
E1 vs. E2	FGA	1	164.53	0.82	0.37
E1 vs. E3	FGA	1	0.10	0.01	0.98
E1 vs. E4	FGA	1	52.74	0.26	0.61
E1 vs. C1	FGA	1	67.17	0.34	0.56
E1 vs. C2-total	FGA	1	894.19	4.48	0.03
E2 vs. E4	FGA	1	32.00	0.22	0.64
E2 vs. C1	FGA	1	18.27	0.12	0.73
E2 vs. C2-total	FGA	1	224.17	1.13	0.29
E3 vs. E4	FGA	1	49.75	0.34	0.56
E3 vs. C1	FGA	1	64.08	0.43	0.51
E3 vs. C2-total	FGA	1	913.08	4.57	0.03
E4 vs. C2-total	FGA	1	473.38	2.37	0.13
C1 vs. C2-total	FGA	1	372.92	1.90	0.17
	Error				
	FGA	115	196.56	-	-

Each of groups E1 and E3 was superior to both the Reading Control group (C1) and the No-treatment Control group "shows" (C2-shows). The dependent variables contributing most to the significant between group differences were reading efficiency (RE) and study habits (DA and WM).

The combination of groups receiving Cognitive Modification (E1+E3) was superior to the combination of groups receiving Behavior Modification (E2+E4) with DA acting as the major contributor to the between group difference. The combination of groups receiving Academic Skill Training (E3+E4) was superior to the combination of groups receiving Counselling (E1+E2), with WM acting as the major contributor to the between group difference.

Group E1 (Cognitive Modification plus Counselling) was superior to all but group E4 (Behavior Modification plus Academic Skill Training) in terms of successful persistence at college over four semesters.

In summary, all of the groups that received some sort of treatment were superior to the No-treatment Control group (C2-shows); however only groups E1 and E3 proved superior to the Reading Control group (C1). Group E3 was superior to

group E1 on study habit improvement, but group E1 was superior to group E3 in successful persistence over four semesters.

The results of all analyses will be examined and discussed in detail in chapter VI.

Table 52

Summary of Comparisons

		1 X 6 Manova FGA DA, WM, RE.	1 X 5 Manova Resid. FGA DA, WM, RE.	2 X 2 Manova FGA DA, WM, RE, HW, SCHED.	2 X 2 Manova Resid. FGA DA, WM, RE.	Chi^2 Pass vs. Fail
E1 vs. E2	Tables 16, 17, 46.	E1(.020) FGA nsd DA .038 WM nsd RE .035	E1(.029) FGA nsd DA .010 WM nsd RE .036	-	-	E1(.01)
E1 vs. E3	Tables 19, 20, 46.	E3(.029) FGA nsd DA nsd WM .029 RE nsd	E1(.013) FGA nsd DA nsd WM .018 RE nsd	-	-	E1(.05)
E1 vs. E4	Tables 21, 22, 46.	E1(.007) FGA nsd DA nsd WM nsd RE .049	E1(.002) FGA nsd DA nsd WM nsd RE .049	-	-	N.S.D.
E1 vs. C1	Tables 23, 24, 46.	E1(.026) FGA nsd DA .048 WM nsd RE .011	E1(.023) FGA nsd DA .016 WM nsd RE .011	-	-	E1(.05)
E1 vs. C2	Tables 25, 46.	E1(.001) FGA nsd DA .047 WM nsd RE .001	-	-	-	E1(.02)
E2 vs. E3	Tables 26, 46.	N.S.D.	E3(.027) FGA nsd DA .002 WM .057 RE nsd	-	-	N.S.D.
E2 vs. E4	Tables 27, 28, 46.	N.S.D.	N.S.D.	-	-	N.S.D.
E2 vs. C1	Tables 29, 30, 46	N.S.D.	N.S.D.	-	-	N.S.D.
E2 vs. C2	Tables 31, 46.	E2(.007) FGA nsd DA nsd WM nsd RE .001	-	-	-	N.S.D.

(Continued on next page)

Table 52

Summary of Comparisons (Cont'd)

		1 X 6 Manova FGA, DA, WM, RE.	1 X 5 Manova Resid. FGA, DA, WM, RE.	2 X 2 Manova FGA, DA, WM, RE, HW, SCHED.	2 X 2 Manova Resid. FGA, DA, WM, RE.	Chi^2 Pass vs. Fail
E3 vs. E4	Tables 32, 33, 46.	N.S.D.	N.S.D.	-	-	N.S.D.
E3 vs. C1	Tables 34, 35, 46.	N.S.D.	E3(.042) FGA nsd DA .003 WM .009 RE nsd	-	-	N.S.D.
E3 vs. C2	Tables 36, 46.	E3(.001) FGA nsd DA .007 WM nsd RE .001	-	-	-	N.S.D.
E4 vs. C1	Tables 37, 46.	N.S.D.	N.S.D.	-	-	N.S.D.
E4 vs. C2	Tables 37, 46.	E4(.009) FGA nsd DA nsd WM nsd RE .001	-	-	-	N.S.D.
C1 vs. C2	Tables 15, 46.	C1(.039) FGA nsd DA nsd WM nsd RE .004	-	-	-	N.S.D.
E1+E2 vs. E3+E4	Tables 40, 42.	-	-	E3+E4 (.041) FGA nsd DA nsd WM .008 RE nsd HW nsd SCH nsd	E3+E4 (.025) FGA nsd DA nsd WM .008 RE nsd	-
E1+E3 vs. E2+E4	Tables 43, 44.	-	-	E1+E3 (.023) FGA nsd DA .012 WM nsd RE nsd HW .031 SCH nsd	E1+E3 (.007) FGA nsd DA .002 WM nsd RE nsd	-
E1+E4 vs. E2+E3		-	-	N.S.D.	N.S.D.	-

CHAPTER VI

Discussion

The primary concern of this study was to develop a set of treatment procedures that would aid skill deficient students to improve their study habits, to improve their reading skills, and to raise their final grade averages. The treatment procedures examined included group counselling, academic skill training, reading skill training, and training in self-modification techniques.

The secondary concern of this study was to examine whether or not Lazarus' "multi-modal" model could be useful in facilitating the choice of combinations of treatment procedures to be tested, and in explaining the levels of effectiveness of the various combinations.

The first part of this chapter will examine the findings with respect to the question of whether or not an effective

treatment combination was developed. The second part of the chapter will examine the results with respect to the usefulness of Lazarus' model in explaining and predicting the findings. The implications of the findings, and the implications for future research will be discussed in the third part of the chapter.

Effectiveness of the Independent Variables

In this section the effectiveness of the independent variables, individually and in combination, will be examined. Table 53 provides a list of the abbreviations used and shows the independent variables to which each group was exposed.

Psychology course: self-modification theory (PSYCH). The effect of the training and practice in self-modification techniques given to members of groups E1, E2, E3, and E4 was not intended to be separated out from the effects of the two self-modification variables (CM and BM) described below. Because each of the four above-mentioned groups also received either the Cognitive Modification treatment (CM) or the Behavior Modification treatment (BM), the effects of the psychology course variable will be examined as part of BM and CM.

English course: reading and study skill training (ENG). The training in reading skills provided in this procedure was

Table 53

List of Abbreviations and
Distribution of Treatments Over Groups

AST	Academic Skill Training
BM	Behavior Modification
CM	Cognitive Modification
CLG	Group Counselling
DA	Delay Avoidance scale - SSHA
ENG	English course - reading skill training
FGA	Final Grade Average
HW	Hours of Study per Week - average
PSYCH	Psychology course - self-modification training
RE	Reading Efficiency measure - DRT
SCHED	Ratio of Hours-Studied-on-Schedule to Hours-of-Study-Scheduled.
WM	Work Methods scale - SSHA

Group	Treatments
E1	ENG + PSYCH + CM + CLG
E2	ENG + PSYCH + BM + CLG
E3	ENG + PSYCH + CM + AST
E4	ENG + PSYCH + BM + AST
C1	ENG
C2	No treatment

clearly effective. The No-treatment Control group (C2) made virtually no gains in reading efficiency (RE) scores, while RE gains for the other groups ranged from 170 percent for the Reading Control group (C1) to 240 percent for group E1. Although all the experimental groups (E1, E2, E3, and E4) had apparently substantially larger gains in RE than the Reading Control group (C1), only group E1 had RE gains that were significantly different from those of group C1. This finding seems to indicate that in order to have achieved significant gains over reading training alone, a complex interactional effect involving reading training (ENG), cognitive modification (CM), and counselling (CLG) was required.

Cognitive modification (CM). The Cognitive Modification procedure was effective. The two groups that received CM, group E1 and group E3, were each superior to each of the No-treatment control (C2) and the Reading Control (C1) groups, as well as to group E2. As mentioned in chapter V, group E1 tended to be superior in delay avoidance (DA) and reading efficiency (RE) change scores, while group E3 tended to be superior in DA and work methods (WM) change scores. In addition, the combination of the two groups that received CM (E1+E3) was superior to the combination of the two groups that received BM (E2+E4). This

superiority manifested itself in significantly superior DA, RE and HW (hours-of-study-per-week) change scores.

The most powerful effect of CM appears to be in combatting delay avoidance, i.e. "putting off" studying. This is reflected in the DA change scores, and appears to be supported by the HW and RE change scores. CM appears to help students get study behavior started by overcoming delay avoidance, and once started, the hours of study (HW) accumulate. As described below, CM, in conjunction with Counselling (CLG), seems to aid in getting reading skill practicing done, resulting in RE gains.

Behavior Modification (BM). The behavior modification procedure was apparently not effective. Although the two groups that received BM, groups E2 (BM+CLG) and E4 (BM+AST), were significantly superior on change scores to the no-treatment control group "shows" (C2-shows) at the multivariate level, most of that difference can be attributed to the significant RE gains. Since there was no significant difference between the reading control group (C1) and either of groups E2 or E4 on any of the dependent variables, it must be assumed that the reading training procedure (ENG) accounts for most of the RE change score differences. Neither of the groups that received the BM treatment (E2 and E4) was

significantly different from the total no-treatment control group (C2-total) on FGA change scores.

The behavior modification procedure (BM) does not appear to have been effective in combination with any of the other treatment procedures, and in fact, by interacting with CLG may have had a negative effect on some of the dependent variables (see below).

Academic Skill Training (AST). The academic skill training procedure seems to have had a powerful effect on WM change scores. Each of the groups receiving AST, groups E3 (CM+AST) and E4 (BM+AST), approached significance or were significantly superior to groups E1, E2, and C1 on WM change scores. The combination of groups that received the AST treatment (E3+E4) was significantly superior to the combination of groups that received the CLG treatment (E1+E2) on WM change scores. Since the WM scale measures work methods, that is, study techniques, it is perhaps not surprising that a procedure which teaches those very skills should have a strong effect on this measure.

Counselling (CLG). Group counselling does not seem to have been effective alone. One of the groups that

received counselling (E1; CM+CLG) was superior to most of the other groups on several measures, but in that case the CM treatment seems to have been a more powerful factor than the CLG treatment. The other group that received counselling (E2; BM+CLG) did not perform any better than the Reading Control group (C1), nor, except for RE change scores, any better than the no-treatment control group (C2). CLG seems to have had some interactive effects with CM and BM (see below).

Cognitive Modification plus Counselling (CM+CLG). The interaction of CM with CLG and ENG seems to have had an effect on the complex set of behaviors related to disciplining oneself to spread one's efforts equally over all courses, rather than concentrating on favored courses, and spreading the work load more equally over the whole term, rather than cramming. The effect is to maintain a passing average over four semesters, and to continue in school rather than failing and dropping out. This effect is evident in the Chi Square analysis which showed group E1 (CM+CLG) to be significantly superior to group E2 (BM+CLG), group E3 (CM+AST), the reading control group (C1; ENG), and the No-treatment control group (C2-total) in terms of the ratio of

passing students to failing/drop-out students over four terms.

Cognitive modification (CM) also seems to interact with the Counselling treatment (CLG) and reading training (ENG) to substantially increase reading scores (RE) to the point where they are significantly superior to those obtained by exposure to reading training alone. While it would appear that CM affects the reading scores by reducing delay avoidance, thus getting the students started practicing reading, the role of the CLG treatment is not clear. Perhaps the contribution of CLG lies in aiding the students to perceive the importance of acquiring reading skills, thus functioning as a motivational factor.

Behavior Modification plus Counselling (BM+CLG). The combination of the behavior modification treatment (BM) and the counselling treatment (CLG) produced virtually no change in any of the dependent variables, with the possible exception of RE. It may be argued that the lack of treatment effect was predictable given the relatively poor FGA pre-scores of group E2 (BM+CLG); however, both the results of the analysis of residuals, and the fact that other groups, notably group E3 (CM+AST), that started with pre-scores that

were not significantly different from group E2 managed to perform better than group E2, would suggest that the treatment combination was the major contributor to the poor performance. It is possible that a philosophical clash between BM and CLG may have resulted in each neutralizing the effect of the other. CLG presented the idea of personal responsibility for choice and change, whereas BM conveyed a more deterministic viewpoint, suggesting that behavior change would be more or less automatic provided the proper environmental stimuli and consequences were arranged. The students may have simply been confused by the conflict and failed to take action one way or the other, or, as Rosenthal and Bandura observed (1978, p. 623), the treatment aids may have been dismissed by the students because they could not be fitted into the students' belief systems.

Cognitive Modification plus Academic Skill Training (CM + AST). The CM + AST treatment combination was effective in that group E3 was one of the best performers. However, rather than producing an interactive effect, the two independent variables appear to have acted largely independently of one another on separate dependent variables: CM affected DA scores, and AST affected WM scores. Conversely,

with respect to academic performance, group E3 (CM+AST) was the only experimental group for which the four semester passing student to failing/dropout student ratio was worse than the ratio in the first semester.

Behavior Modification plus Academic Skill Training (BM + AST). The BM+AST treatment combination was not effective. It produced only mediocre gains on all dependent variables with the exception of WM, where the AST treatment appears to have been the major factor.

Summary. The independent variables appeared to affect different dependent variables. The reading training treatment (ENG) affected the RE scores, the Cognitive Modification treatment (CM), due probably to the heavy emphasis on control of cognitive cues for study avoidance, affected the DA scores and the HW scores, and the Academic Skill Training treatment (AST) affected the WM scores. The Counselling treatment (CLG) in combination with CM appears to have had an effect on RE scores and on long term academic success in college.

Discussion: Was an Effective Treatment Combination Developed?

While improvements in study habits and reading

efficiency were regarded as legitimate sub-goals in this study, it was hoped that improvements in these areas would be the method by which academic performance, i.e. final grade average, would be improved.

In terms of improvement in study habits, the CM+CLG combination of treatments to which group E1 was exposed, and the CM+AST combination of treatments to which group E3 was exposed each produced gains in study habits scores that were significantly superior to those of the Reading Control group, however the mean post-scores on study habits for these groups did not exceed the fiftieth centile (college freshman norms), which is to say that the study habits, while improved, remained largely inefficient.

In terms of improvement in reading skills, the CM+CLG combination of treatment procedures to which group E1 was exposed produced gains in RE scores that were substantially and significantly superior to those of the Reading Control group (C1).

The widely held belief that GPA is extremely resistant to change was upheld by the results of the present study. None of the treatment combinations was effective in improving

final grade average. If final grade average change is examined, however, it is apparent that the groups exposed to two of the combinations, E1 (CM+CLG) and E3 (CM+AST), were able to maintain or slightly improve their final grade averages, whereas the final grade average of the no-treatment control group (C2-total) dropped substantially, creating a significantly different spread. It is possible that, among other factors, a higher degree of difficulty in higher level courses inhibits FGA gain, therefore a legitimate objective with respect to final grade average would be simply to <u>maintain</u> a passing level from one semester to the next. If the definition of success in college is broadened from simply FGA gain to a more comprehensive criterion, that of maintaining a passing average over four semesters (as opposed to failing or dropping out), then the CM+CLG treatment combination can be said to have been effective.

In summary, both the CM+CLG and the CM+AST treatment combinations produced results that were significantly superior to no treatment at all, and to reading training alone. Both of these treatment combinations can therefore be judged to be effective, and on the strength of academic performance over four semesters, the CM+CLG appears to be the more

effective of the two.

Discussion: Does Lazarus' Multi-modal Model Aid in Prediction and Explanation?

Although the results of the study tended in general to form up in the predicted array (i.e. E1 > E4 > C1 > C2), the change scores on the WM variable in two of the comparisons (hypotheses 5 and 16) were contrary to prediction, so the findings cannot be said to confirm Lazarus' theory. The most parsimonious explanation of the findings would be that Lazarus' theory is simply not true, however that would leave the findings still unexplained.

It is possible that the basic premise of the multi-modal model is true, but that the details of the theory have not been refined and operationally defined adequately to permit precise prediction. The following section will explore some of the possible explanations for the findings of this study, and evaluate the multi-modal model in light of the findings.

Possible explanations of the findings. Lazarus (1976, p. 14) notes that for some individuals, some modalities may require less attention than others, perhaps even

require no attention at all. Since no reliable diagnostic instruments existed up to the time of this writing that would have permitted accurate determination of which modalities required invoking in the case of any individual student, the students were randomly assigned to the various treatment groups. It was hoped that the students not requiring the invocation of all modalities would be distributed equally over the various groups. Despite the random assignment of subjects to groups, there remains some possibility that a disproportionate number of students requiring the invocation of fewer than six modalities were placed in groups other than E1. Thus, the treatment procedures to which the other groups were exposed might appear more effective than they should. It is also possible that a disproportionate number of those requiring the invocation of a particular modality were placed in a group that was exposed to a treatment procedure that did not invoke that modality. Finally, it is possible that only a few students required the invocation of all modalities, thus diminishing the effect of the CM+CLG+ENG treatment. In any of these cases, the differential effects of the treatment procedures would be masked.

Rosenthal and Bandura (1978, p.639) state that

treatment procedures sometimes have a more powerful effect in some cases than in others. In this study, for example, the reading training treatment (ENG) and the Academic Skill Training treatment (AST) had powerful effects, perhaps because in each case the problem was one of skill deficit, and was located almost exclusively in the behavior modality. As a result, the power of the treatment procedures may have been focussed on a single modality rather than being diffused over several. By contrast, the Counselling treatment had little effect on the dependent variables, perhaps because the power of the treatment procedure was diffused over several modalities.

It is possible that because the subjects of this experiment were skill-deficient college students, their problems with academic success were located largely in the behavior and in the cognition modalities, and to a much lesser degree in the affect and the interpersonal modalities. The success of the ENG, AST, and CM treatments and the relatively weak effect of the CLG treatment may thus be at least partially explained.

It is possible that the treatment procedures which were intended to invoke specific modalities were

ineffective in doing so. For example, the counsellors who acted as group leaders for the CLG treatment procedure were asked at the end of the treatment period to provide a subjective assessment of the benefit they thought each student had derived from the CLG treatment. Of 31 students rated, the counsellors rated 15 as having derived "little or no benefit," 12 as having derived "moderate benefit," and only 4 as having derived "much benefit."

It is possible that a particular treatment procedure which is intended to deliberately invoke a specific modality may very well invoke other modalities as well. From a clinical point of view, so much the better, but from a research point of view, the findings become more difficult to interpret. If, for example, training in coping self-statements (a part of the CM treatment), a procedure that was intended in this study to invoke the cognition modality, resulted in the students using the techniques to control anxiety and improve interpersonal relationships, thus invoking the affect and the interpersonal relationships modaliites, then groups E1 and E3 would both have been exposed to procedures that invoked six modalities. In that case, the model would predict that there should be little difference between the two groups.

Lazarus writes of "Long-lasting therapeutic change (p. 12)," and, "Durable results (p. 13)," so perhaps a fair evaluation of the multi-modal theory requires that more attention be paid to long term, global measure of success rather than short term, specific outcome measures. In the present study, group E3 (four modalities) was superior to group E1 (six modalities) when the dependent variables were compared in a multivariate analysis of variance, but when a more global measure, "Successful Persistence Over Four Semesters" was examined, group E1 was superior to group E3. It is probable that the treatment procedures used operate on a range of problems and behaviors, many of which are reflected poorly (if at all) in the specific outcome measures used. It is possible therefore, that group E1 (for example) could have changed in ways that were not measured directly by the specific outcome measures, but which contributed to greater long term improvement than the other groups.

Evaluation of the Multi-modal Model. The present study was not intended to offer definite proof of the truth or falseness of multi-modal theory, but rather to explore the potential of the model as a clinical and research tool. In this

study, the multi-modal model was useful in studying the problem of poor academic performance, identifying strategies that had potential for countering poor academic performance, and in making practical decisions concerning which comparisons were to be made in this experiment.

The multi-modal model appears to have great potential as a means of ensuring that all facets of a problem are considered in the treatment procedure. It is evident, however, as Franks and Wilson (1974, 1975) have pointed out, that before the model can be adequately tested, further research is required to identify and precisely define a wide range of techniques which can be proven to have reliable therapeutic effects, and to develop a set of explicit criteria for the choice of technique used to invoke a particular modality.

With respect to the findings of the present study, it can only be said that the multi-modal model appears to be a useful clinical and research tool, but that the multi-modal theory remains unproven.

Limitations of the Study

The present experiment was somewhat limited in

its scope by unforeseen circumstances and by practical considerations. In this section, these limitations will be identified and discussed.

External validity. This experiment was to have been performed simultaneously at another college in order to gain some knowledge of the applicability of the treatment procedures to the general population. Unfortunately, unforeseen circumstances made it impossible to run the experiment at the second college, consequently the findings are applicable to only the population of skill-deficient students at John Abbott College, and to the team that performed the experiment.

Internal validity. The limitations of the study with respect to internal validity are discussed below.

1. As a control for scholastic ability, it had been decided in the planning stages to use a randomized block design similar to that used by Richards (1975), using first term FGA to determine in which block a subject should be placed. The first term averages were not available at the time of distribution of subjects to groups, so it was necessary to rely on simple random assignment. Because of

the predictive power of final grade averages for future final grade averages, and despite the results of the analysis of residuals, there remains a remote possibility that the findings of this experiment are due to statistically unequivalent groups rather than different treatment conditions.

2. Since IQ is one of the predictors of academic performance, it was decided to use IQ scores as a covariant to control for the possibility that random distribution might not produce statistically equivalent groups. The IQ test was administered, but it was discovered after the experiment was over that in one of the IQ testing sessions, the tester in charge of that session had misread the instructions, thus invalidating these data.

3. Obviously, the ideal experimental design would have prescribed all the possible combinations of treatment procedures. It is equally obvious that six independent variables, even allowing for the elimination of absurd combinations, would require hundreds of groups to test the remaining combinations. The actual choice of which combinations were to be tested was dictated by Lazarus' (1976) multi-modal model. The findings suggest that a clearer

picture of the effects of the various treatment procedure combinations might have been obtained if at least two other combinations had been tested. The strength of the AST procedure and the ambiguous effect of the CLG procedure, along with the relative success of groups E1 (CM+CLG) and E3 (CM+AST), suggest that a group receiving CM, CLG, AST, PSYCH, and ENG, and a group receiving CLG, AST, PSYCH, and ENG might have provided useful data.

4. It was assumed that most of the students acting as subjects in this experiment were experiencing difficulties with some or all of the problems described in table 6 and that distribution over all the groups would be equal. Due to a lack of diagnostic instruments, it could not be determined whether the students had any problems other than deficits in reading and study skills prior to the experiment. It was later observed that for many students problems located in other modalities, particularly the cognition modality, existed. It could not be determined however, that any of the students required attention to all six of the modalities invoked, nor that the random distribution procedure had resulted in statistically equivalent groups in this respect.

5. With respect to the concept of "readiness-for-treatment," it was assumed that because the students had volunteered to participate in the Program to Improve Academic Performance, that they were ready to participate in whatever treatment procedures were called for. It quickly became apparent that some students were reluctant to participate in the Counselling treatment procedure (CLG). These students stated that they did not need counselling; however, in some cases at least, it appeared that group counselling could have been useful. Nevertheless, the students did not want counselling, so their reluctant participation and frequent absences from the sessions were probably not helpful to themselves nor the other group members. In a similar vein, some students rejected some parts of the two self-modification treatment procedures (CM and BM) as being "silly" or "humiliating." As previously mentioned, Rosenthal and Bandura (1978) indicated that subjects will not work at procedures in which they do not believe, and Devine and Fernald (1973) reported that subjects who were permitted to choose a preferred treatment procedure exhibited significantly less fear of snakes than subjects who were assigned to a non-preferred treatment procedure, or who were assigned at random to

treatment procedures. It would appear that permitting the students to choose a preferred treatment procedure and/or the development of some method of presenting the treatment procedures in a positive manner so that the students would more readily accept the treatment procedure to which they were assigned, might have improved the students' readiness to receive treatment, and might have amplified the effect of the treatment procedures.

6. Reliable follow-up data were not obtained. Some of the students with relatively high final grade averages apparently transferred out, and some of the students with final grade averages which eventually fell below the passing level dropped out after the second semester. The effect of this experimental mortality was to render unreliable any follow-up of the outcome criteria because, while the transfer-outs were distributed relatively equally over the groups, the dropouts tended to come from groups that had performed poorly in the second semester (see tables 14 and 45), thus artificially equalizing the follow-up scores.

Implications for Further Research

The research required to clarify and add to the findings of the present study will be described in this section. Included will be the research implied in the section "Limitations of the Study."

Replication. Replication or extension of this study with the addition of controls for IQ and for previous academic achievement, and with the addition of two more groups as described in the preceding section, would be useful. The replication would test for external validity, and the controls would reduce to a minimum the possibility that either IQ or previous academic achievement was a factor in the findings. The addition of a CM+CLG+AST group would test whether or not the performance of such a group would exceed that of the CM+CLG and the CM+AST groups, and the addition of a CLG+AST group would help clarify the extent of the CM contribution to the findings.

Diagnosis and data-based treatment choice. In order to develop a set of treatment procedures, parts of which can be applied as needed to any individual's problem of poor academic performance, a series of experiments

similar to those called for by Franks and Wilson (1974, 1975) and Lazarus (1976) are required, directed at the following three areas.

1. The identification of the various factors that contribute to academic success which would permit the identification of specific problems related to each factor.

2. The identification of existing treatment procedures and the development of new treatment procedures that are clearly successful in treating specific academic problems in a wide range of academic settings.

3. The development of a diagnostic instrument or instruments covering the full range of modalities, that would identify the specific problems related to poor academic performance and the modalities in which they are situated.

Together, the data from these three areas of research would permit accurate diagnosis followed by data based choice of effective treatment procedures appropriate to each specific problem.

Readiness for Treatment. The concept of readiness-for-treatment as it applies to the problem of poor academic performance requires research. Garfield (Garfield & Bergin,

1978, p. 201) reviewed a number of studies which addressed the problem of premature termination of therapy. A variety of pre-therapy strategies aimed at reducing drop-outs and improving therapeutic outcome have been devised, including "anticipatory socialization interviews" (Heitler, 1973, 1976), "vicarious pre-training" (Truax & Wargo, 1969), and role induction films (Strupp and Bloxom, 1973). Treatment effect might be greatly enhanced if it were possible to identify those subjects who were "ready" (i.e. committed to change; experiencing a felt need for treatment; aware of what would be expected of them in treatment; etc.) and expose them to treatment. For those who were not "ready," exposure to treatment could be delayed until they were "ready", or exposure to a pre-treatment procedure of the type described above, which would facilitate "readiness" could be substituted.

Final Grade Average. If academic success is defined as raising final grade average to, or maintaining final grade average at, a satisfactory passing level in all courses over a complete college program, then research into the factors contributing to final grade average gain and maintenance is needed. Some of the factors suggested by the findings of

this study are as follows.

1. Self-established standards: The "Personal Passing Grade." During the self-modification technique training procedure (PSYCH), the majority of students indicated to the experimenter that they had "personal passing grades" which were often different from the college pass mark of 60 per cent. Consistent with Bandura's (1969, p. 32) assertion that people set their own standards (quoted on page 6), these students had apparently established a number, for example 80 percent, which if exceeded in a course would be satisfying, but if not exceeded would be regarded almost as disappointedly as a failure, even although credit would still be received for passing the course. It was later established that some students seem very accurate at guaging the amount of effort required to achieve the "personal pass mark" in any given course. This raises the question of the effect of self-established standards on final grade average. Assuming that students do have a "personal pass mark," and that they do attempt to expend only enough effort to reach that mark, it is possible that some students have set their personal pass mark lower than they are capable of achieving. The effect of improving their academic skills may be simply to

permit the students to achieve the same grade with less effort, and so the improvement in academic skills is not reflected in final grade average change. With respect to the above, Rosenthal and Bandura (1978, p. 641) note that, "although confident of their ability to perform, people withhold actions that are judged too costly or against their best interest." Research into the development of a procedure directed at persuading each student to set a "personal pass mark" appropriate to his potential might have implications for the problem of improving final grade average.

2. Expectancy. Garfield (Garfield & Bergin, 1978) reviewed a large number of studies which, despite problems of definition and methodology, seem to suggest that manipulation of clients' expectations of outcome success has a positive effect on the outcome of therapy. For ethical reasons, no manipulation of expectations was used in this experiment, but it is likely that as more data are collected regarding the probability of success in overcoming the various academic problems by the acquisition of specific skills and/or the performance of specific behaviors, research into the effects of manipulation of expectancy may reveal positive effects on final grade average.

3. Study Habits. In this experiment, the study habits scores improved somewhat for all groups, but except in one case, no group raised the mean post-scores on DA or on WM above the fiftieth centile. This suggests that either the students failed to learn the study habit skills well, or that the students learned the skills, but as Beneke and Harris (1972) observed, failed to use them. Rosenthal and Bandura (1978) note that learning of a complex behavior is most often best accomplished by a combination of narrative instruction and modeling. In this study, the academic skill training procedure (AST) was exclusively in the form of narrative instruction (with the added disadvantage of being tape recorded), which may have resulted in many of the students not learning to perform the study behaviors efficiently. It is likely that refining the procedures used in the AST treatment to include some form of modeling such as used by Kunce, Bruch and Thelen (1974), might help to improve study habits test scores, particularly if combined with procedures that increase the probability of the students actually using the study behaviors learned. Since study habits scores have been shown to correlate positively ($r = 0.36$) with GPA (Brown & Holtzman, 1967), it is possible that improvement in these scores might also mean improvement in final grade average.

4. Motivation. The only apparent difference between those members of the No-treatment Control group who returned for posttesting (C2-shows) and those who did not, is that the former returned and the latter did not. The significantly different FGA pre- and post-scores are not explained by any of the outcome measures used, leaving only some mysterious "motivational" factor to account for the differences. As Mahoney and Arnkoff (1978) point out, the question of motivation represents one of the perennial issues facing any therapeutic endeavour. Research providing information about how students are motivated to perform study behavior would undoubtedly prove valuable.

Original Contributions of the Study

Theoretical contributions. While the findings of the study have offered, at best, qualified support for Lazarus' multi-modal theory, the study itself has demonstrated the potential utility of the multi-modal model for clinical practice. In addition, the study has underlined the need for research in the areas of diagnosis and development of data-based treatment choice criteria such as that called for by Franks and Wilson (1974, 1975), and by Lazarus himself (1976).

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The findings of the present study have demonstrated the following at statistically significant levels.

1. Cognitive self-modification combined with group counselling and reading skill training (CM+CLG+ENG) has a more positive effect on successful persistence at college (a) than no treatment at all, (b) than reading training alone, and (c) than either of the combinations of cognitive self-modification plus academic skill training plus reading skill training (CM+AST+ENG) or behavior self-modification plus group counselling plus reading skill training (BM+CLG+ENG).

2. Cognitive self-modification combined with group counselling and reading skill training improves reading scores more than just reading skill training alone.

3. Cognitive self-modification combined with group counselling and reading skill training (CM+CLG+ENG), or combined with academic skill training and reading skill training (CM+AST+ENG) has a more positive effect on maintaining final grade average than no treatment at all.

4. Cognitive self-modification procedures reduce delay avoidance (DA); i.e. improve scores on the DA scale of the SSHA.

5. Academic skill training improves study technique (WM) more than group counselling.

Practical applications. The present study has demonstrated that an effective program directed at improving academic performance can be operated within the framework of a regular college program, granting college credit for the courses taken, and using personnel drawn from the regular teaching staff and the regular student services staff. The student aides used in the study were required to control for experimenter bias, but were otherwise non-essential. Their function could easily be absorbed by the student services personnel. The cost to the college of such a program, other than the salaries of personnel already on staff, would be minimal.

At John Abbott College, the treatment procedures tested in the study are intended to become part of a larger program that will be coordinated by a committee of student service and academic personnel. The committee will operate a learning centre which will, for the most part, have a diagnostic function, serving to help the students identify their problems and enrol in the appropriate courses. The courses, as in the present study, will have more than adequate academic content to qualify for course credit, but will be applied courses, and will

thus serve a remedial function.

The prevention of academic failure and consequent dropout is of obvious benefit to the students; however it is equally important to the colleges, in times of declining enrollment, that those students accepted as freshmen complete their programs. The present study has demonstrated that dropouts and failures can be reduced at minimal cost.

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APPENDICES

APPENDIX A

Plan d'Etude
Psychology Course

JOHN ABBOTT COLLEGE

Psych. 350-901 Development of the Person — Alex Stirling

OBJECTIVE:

To enable the students to improve their control over their own development by the application of the principles of learning theory to the self-directed modification of their behaviors, including ocovert behaviors such as thoughts, self-statements, self-instructions, attitudes, beliefs, images, etc.

GOALS:

At the end of the course, the students will:

1) understand the principles of learning including operant and classical conditioning of both overt and covert behaviors.

2) underst nd the effect on behavior of altering the antecedent situation and the consequences of it.

3) understand the effect of altering cognitive behaviors, especially self-statements and self-instructions.

4) be able to apply the above in the design of self-modification programs.

5) demonstrate their understanding of the above by designing and executing a self-modification program which will improve their reading/studying behavior.

COURSE REQUIREMENTS AND EVALUATION:

1) Write several quizzes designed to test knowledge of the principles of learning (30% of final mark).

2) Mini-project. Choose a behavior with which there is some dissatisfaction, design and execute a "mini" self-modification program as a practice exercise. (20% of final mark).

3) Maxi-project. Design and execute a major self-modification program aimed at modifying behavior related to reading/studying.

4) Where subjects are available, act as contingency manager/tutor for a junior high school student in a reading program.

TEXT:

1). Watson and Tharp. Self Directed Behavior: Modification for Personal Adjustment. Brooks/Cole 1972.

2) J.A.C. Reading Research Package.

APPENDIX B

Plan d'Etude
English Course

COLLEGE READING RESEARCH

English 603-104 Winter Semester 1977
Instructor: Pearl Grubert

COURSE DESCRIPTION:

This course is designed to help the student improve his general reading ability. This will be accomplished through practise in the various skill areas which constitute the reading process. The overall objective is to make each student a more efficient and effective reader by giving him practice during class time in

1) increasing rate of reading, with maintenance or improvement of comprehension in easy-to-read material
2) developing more effective study habits which will cause a corresponding improvement in comprehension in content area reading
3) increasing vocabulary knowledge for general reading as well as in subject area material.

An essential part of this program will be the CEGEP student's practise and application of the above listed skills in his own academic endeavours. Concurrently, however, the college student will be taught methods for teaching these skills to others, either at the high school level or college. This tutoring will continue for ten weeks during the term, with each session lasting for approximately one hour.

Students enrolled in this programme take two credit courses: English 104 described above and Psychology 901, with instructor Alex Stirling. The English course provides the practical methodology for improving reading and study skills. The psychology course presents information designed to help the student actually apply the techniques so as to change his own behaviour and attitudes towards reading in general, and studying specifically.

MATERIALS:

Most of the books required for this course have been specially prepared by the instructors. They will be supplied to the students for the cost of printing and include the following:

Tricks of the Trade

College Student's Personal Log

Reading Efficiency; Handbook for Tutors; Behaviours Technology

In addition, students are required to buy at the bookstore:

Timed Readings Level 7 - Jamestown Publishers

For each class session, the student is required to bring one easy-to-read book for use in speeded exercises.

EVALUATION:

The student's mark will be based upon his personal improvement in each of the areas being practised in class. Therefore, it is imperative that the student complete each of the activities to the best of his ability. Most of the progress in each of the areas will be recorded in the College Student's Personal Reading Log. This will be handed in for marking purposes by April 29, 1977. The subject area test and vocabulary test will be given in the week of May 2, 1977. The final Diagnostic Reading Test will be given on May 10, and 11, 1977. Failure to sit for this test will result in an Incomplete for the course(s). (See attached sheet).

COURSE EVALUATION:

Attendance: Due to the nature of this particular course with its emphasis upon practical application of various skills, attendance is both necessary and compulsory for those wishing to improve. It is the policy of the College Reading Research Project that any student who misses more than 4 classes throughout the semester (for reasons other than illness) will be automatically issued an EA (failure due to absence).

TUTORING:

Each student will be required to draw up a report following each tutoring session. These 10 reports will then be synthesized into a final report which will be worth 30% of the final mark.

.../3

EVALUATION

SECTION I

SPEED AND ACCURACY — Total: 25 marks

a) Alarm Clock Reading Sheets — 1. _____(5)
b) Paper Clip Reading Sheet — 2. _____(5)
c) Timed Reading Graph — 3. _____(5)
d) Book forms - Number filled out ____ — 4. _____(10)

Your Total _____

SECTION II

VOCABULARY — Total: 15 marks

Your Total _____

SECTION III

SUBJECT AREA TEST — Total: 15 marks

Test _____

SECTION IV

REPORTS — Total: 30 marks

Tutor Report _____

Your Total _____

SECTION V

BONUS POINTS — Total: 15 marks

Your Total _____

TOTAL MARK IN ENGLISH 104 _____

APPENDIX C

Diagnostic Reading Test

DIAGNOSTIC READING TESTS
SURVEY SECTION: UPPER LEVEL
(From Grade 7 through College Freshman Year)

FORM A

By *The Committee on Diagnostic Reading Tests, Inc.:*
Frances Oralind Triggs, *Chairman;* Robert M. Bear, Dartmouth College;
George D. Spache, University of Florida; Agatha Townsend, Editor;
Arthur E. Traxler, Educational Records Bureau; Frederick L. Westover, University of Alabama.

Do not write in these spaces unless told to do so. Read the general directions below.

Name (Please print clearly)_____
(Last name) (First name) (Middle name)

Grade_____ Sex_____ Age_____ Date of Birth_____
M or F Yrs. Mos.

School_____ Date Today_____

City_____ Teacher_____

GENERAL DIRECTIONS

THE PURPOSE of this test is to find out how well you can read. There are three parts: General Reading, Vocabulary, and Comprehension. The examiner will tell you when to start and when to stop each part. Be sure to follow instructions exactly. Do not begin any new part until you are told to do so.

Read each question carefully, but do not work too long on any *one* question. You can use any extra time you may have at the end of each part by going back and working on the questions in that part about which you were in doubt. You may not return to a part after the time for that part is over. You may answer questions about which you are not entirely sure, but you should avoid wild guessing.

Before each part of the test you will find directions. These directions explain how you are to record your answers regardless of whether you are recording them on separate answer sheets or in the booklet. The examiner will go over these directions with you in detail before you start the test.

	RAW SCORES	GRADE	PERCENTILES
Score 1a. Rate of Reading (General Reading)			
Score 1b. Story Comprehension (Items 1-20)			
Score 2. Vocabulary (Items 21-80)			
Score 3. Comprehension (Items 1-20 and 81-100)			
Score 4. Total Comprehension (Items 1-100)			

Former Members of the Committee: IVAN A. BOOKER, 1945-1960; A. EASON MONROE, 1945-1950; DANIEL D. FEDER, 1945-1961; CONSTANCE M. McCULLOUGH, 1945-1963

Published and Distributed by *The Committee on Diagnostic Reading Tests, Inc.*
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259 East Erie Street, Chicago, Illinois 60611 Reorder No. 7-1421

PART 1: GENERAL READING

DIRECTIONS: This is a test of your skill in general reading. Read the short article in this test in the same way that you ordinarily read any easy, interesting stories or articles. Read as rapidly as you can and still understand what you read. When you finish reading, you will be asked to answer questions on the material you have read.

To start the test, everyone will read together the lines at the bottom of this page. The examiner will read *orally* and you should follow, reading *silently*. When we come to the last word on the page, the examiner will stop, and you will simply turn the page and keep right on reading.

After you have read for several minutes, the examiner will say "Mark."

IF THE ANSWERS ARE TO BE RECORDED IN THIS BOOKLET, put a circle around the word you are reading when the examiner says "Mark." Then go right on reading.

IF THE ANSWERS ARE TO BE RECORDED ON SEPARATE ANSWER SHEETS, you will use the place on the answer sheet labeled "Scores." On the separate *answer sheets* find space 1a under "Scores" and place a check mark there. Note that each line of the reading selection is numbered in the left-hand margin. When the examiner says "Mark," *write the number of the line you are reading in Space* 1a under "Scores" on your *answer sheet*. After you have written this number, go right on reading the article.

When you finish reading you will find printed directions telling you what to do next. DO NOT READ ANY PART OF THE SELECTION MORE THAN ONCE.

If you have any questions about the directions, *ask them now;* if not, wait for the signal to turn to the next page.

THE CROW

If human beings wore wings and feathers, very few of them would be clever enough to be crows. The common crow, whether in the wild state or kept as a pet, is a genius in feathers and an endlessly astonishing bird.

A crow owned by a lady in Stuart, Ohio, was so dainty that he insisted on washing worms before he would eat them. A Staten Island crow not

only could pick pockets but when he found a pocket empty, would swear at his victim and fly away in a huff.

Not all crows can talk. Their individual ability varies greatly in this respect, and probably no crow can talk better if its tongue is split. Certain ones captured when young have been known to learn a hundred words and half as many complete phrases. There are even records of wild crows picking up and using such human expressions as "Giddyap!" and "Whoa!" and "Hey!" which they hear farmers shout in the fields.

When a crow does speak human language, he often gives the impression that he knows the exact meaning of what he is saying. A moonshiner, who had kept a pet crow as a lookout against government agents, was taken to jail. The crow was taken too. The human prisoner gave no trouble, but the bird proved something of a problem. He yelled, "I want water!" when the supply in the cell began to dwindle. Whenever an attractive female visitor passed through the jail corridor, he thrust his neck between the cell bars, stared at the lady, and muttered, "Oh-boy-oh-boy-oh-BOY!"

The common crow, with his three closely related varieties, the Florida crow, southern crow and western crow, is found practically all over our country east of the Rocky Mountains, as well as in sections of the Northwest and along our western coast down to Southern California.

In building their nests, as in everything else, crows prove that they are individualists. Most often the nest, a bulky structure of coarse sticks, twigs, grasses and tree bark, lined with soft rootlets of fur or moss, is in an evergreen, and is about thirty feet from the ground. They often decorate their nests by inserting in them a shiny pebble or glittering pieces of glass.

As crows are always more or less clannish, there are usually a number of nests within a small area, and the occupants exercise their sly mischievousness by stealing each other's nesting materials. When one of the nesters flies off to feed for a while, one of his dark neighbors rushes to the unprotected nest, removes from it the choicest bits of moss and rootlets, and hides them in his own nest. Then, when the thief is absent from his nest for a while, the recently burglarized bird flies over and regains all the stolen goods, plus half a dozen other choice bits. This pilfering is probably a friendly joke, for actually crows are devoted to one another and are bound by a sense of unity that leads them to show each other extraordinary courtesy and understanding.

The young stay in the nest about three weeks, consuming their weight in food every day, and by the time they are ready to leave they look almost like their parents except that their coats have less luster. For several days they practice flight maneuvers and wing drills before the critical elders of the flock. The oldsters show them the lay of the land and teach them the rules of the community of fifty or sixty crows nesting in the neighborhood.

Despite the individualism of its members, a flock is as disciplined as an army. It posts sentinels in a high tree to keep watch while the others feed. It has special flight maneuvers: low, fast and scattering for the mornings; high, slow and single-file for the evenings; forty-five miles per hour in absolute silence when the sentry signals that a man with a gun is coming. When traditional enemies such as owls or foxes are sighted, it is a rule that all flock members must raise a terrific rumpus. Only when the young have been trained in these practices are they ready for adulthood.

The youngsters take advantage of their long apprenticeship to swindle as much free food as possible out of their parents. Although perfectly able to forage for themselves, they pester their elders with loud and piteous cries to be fed. Sometimes the cleverest of the young feign illness in order to sponge on their parents.

Life for crows, as for all other creatures, consists principally of getting enough to eat and avoiding enemies. Crows can and do eat almost anything: wasps, toads, or even poison ivy. They eat so many other things that a list of them takes three pages of fine type in a Department of Agriculture report. Certain items are special favorites, and crows' inventions for getting them are endless.

Hunting for mice, for instance, is tedious, so a crow sometimes rides on the back of a pig that is foraging in the field. When the rooting porker turns up a field mouse, the crow gobbles the mouse and flies off with a mirthful cackle. To get shellfish, which he loves but which his beak is not strong enough to open, a crow picks up a clam or oyster, flies high in the air, and drops the shelled morsel on a rock.

There is no limit to the hunting tricks of the crow, and very little limit to his appetite and digestion. A pet crow belonging to a Long Island naturalist once consumed a pint of house paint and survived.

Crows have a vocabulary, some naturalists believe, of at least twenty-five caw-words for keeping each other posted on doings in the neighborhood. All crows can hear so well that they detect the snap of a twig in the woods more acutely than any other wild creature except a deer. State

and local governments have offered bounties on crows for years, but experts agree that there are more crows in the country today than there were when the Pilgrims landed.

Without serious threat from enemies or starvation, crows are free to spend much of their time in games and practical jokes. One favorite and rowdy game is Waking The Sleepers. On hot noondays they love to fly silently over the countryside, sneaking up on a slumbering rabbit and rapping him sharply on the skull or settling silently on the backs of drowsy cattle and then setting up a sudden uproar that terrifies the cows.

Another sport is Hide and Seek. A young crow leaves the flock, hides in a hollow tree, and loudly sounds the distress caw. The flock rushes to the spot, fails to find him, and flaps away again. The distress caw is again sounded. Back comes the flock, hunts vainly again, and again goes away. This may be repeated a dozen times, after which the young crow pops out of concealment and guffaws. The flock, far from being annoyed, bursts into a hawing and cawing of general merriment.

When a crow has committed an offense against the laws of crowdom, the flock gathers in judgment. The offender perches on a branch at some distance from the rest of the assemblage, while the other crows hold a meeting, lasting sometimes for hours. Then the discussion suddenly ceases, and there is a moment of silence, after which the flock either rises in unison and flaps away about its business or swoops down in a mass dive upon the offender, pecks his eyes out, and buffets him to death.

In autumn the small summer flocks of crows gradually merge together into larger flocks, and presently they make their way to their great winter roosts. These roosts are sometimes 1,500 miles south of the summer feeding grounds. The crow population of a vast roost not far from Baltimore has been calculated to be 230,000. A roost near Arlington National Cemetery has housed 150,000 crows; another at Peru, Nebraska, contained 100,000. These great roosts have been used for centuries; records show that some of them have been occupied by wintering crows since the white man first arrived in this country.

Crows' influence on agriculture is about evenly divided between harm and good. About seventy-two percent of a crow's diet is of vegetables, fruits, and nuts, and about half the vegetable category is corn. The remaining twenty-eight percent is of insects, rodents, and a few odds and ends such as eggs and fledglings of wild birds, poultry chicks, carrion, and reptiles.

Many are the tales told of the amazing doings of pet crows. A crow named Pete that lived in the South in the 1830's was one of the most famous characters that the Bluegrass Country ever produced. Pete was responsible for the introduction of starting bells at race tracks. He was in the habit of frequenting the Georgetown race track, and on the day of a big race, just as the horses were being lined up, Pete created a riotous scene by yelling "Go!"

The knowingness of a crow is not the thought-born "intelligence" of a man. It is rather a thing of natural cunnings and an innate prankish glee. By it the crow is enabled to enjoy life and to hold his own in a hostile world. To all who observe him, the crow is a source of constant surprise.

Turn to the next page.

Read the directions.

Mark the answers according to the directions.

8

QUESTIONS ON *The Crow*

DIRECTIONS: Read the statement. Choose the answer that agrees with the test selection you have just read, even if you have a different opinion about it.

IF THE ANSWERS ARE TO BE RECORDED IN THIS BOOKLET, place the number of the answer in the parentheses at the right. Study the following example:

Sample: The color of grass is
(1) green (2) blue (3) purple (4) orange . . . . . (1)

IF THE ANSWERS ARE TO BE RECORDED ON SEPARATE ANSWER SHEETS, make a *heavy, black, glossy mark* on the answer sheet under the number that agrees with the number of the answer you chose. Use the special pencil which your examiner gave you. Study the following example:

Sample: The color of grass is
(1) green (2) blue (3) purple (4) orange

Notice the space under number one has been marked because the correct answer, green, has that number.

Do NOT go back to the reading selection.

1. Splitting a crow's tongue
   (1) makes it possible for the crow to talk .....( )
   (2) makes no difference in its ability to talk.....( )
   (3) will keep it from learning to talk.....( )
   (4) improves the distinctness of its speech .....( )

2. The story of the crow in the jail illustrates the fact that crows
   (1) are loyal pets.....( )
   (2) make good lookouts.....( )
   (3) can easily adapt to any situation.....( )
   (4) frequently seem to know the meanings of the words they speak.....( )

3. The nest of a crow is usually found
   (1) in a low bush.....( )
   (2) in a tree.....( )
   (3) on a rocky ledge, thirty or forty feet above the ground.....( )
   (4) in a deserted house or barn.....( )

4. Crows frequently
   (1) steal each other's nesting materials.....( )
   (2) lay their eggs in the nests of other birds .....( )
   (3) conceal their nests to prevent other crows from stealing their eggs....( )
   (4) attack and kill the young in the nests of other crows.....( )

5. Relationships among the crows in each flock are best described as
   (1) independent and unfriendly.....( )
   (2) deceitful and suspicious.....( )
   (3) aggressive and quarrelsome.....( )
   (4) friendly and courteous.....( )

6. A community of crows during the nesting season usually includes
   (1) ten or twelve members.....( )
   (2) fifty or sixty members.....( )
   (3) four or five hundred members.....( )
   (4) several thousand members.....( )

7. When the young crows are ready to leave their nests, the adults
   (1) instruct them in the rules of the flock .....( )
   (2) abandon them to forage for themselves .....( )
   (3) try to prevent them from flying away to join other flocks.....( )
   (4) hold a meeting and choose the future leader of the flock.....( )

8. If in the early evening, you were standing near the night roosting place of a flock of crows, you might expect to see them flying in to roost
   (1) from all directions, singly.....( )
   (2) fast and in groups of threes and fours .....( )
   (3) slow and single-file.....( )
   (4) at forty-five miles per hour in absolute silence .....( )

9. When crows discover a fox, they usually
   (1) swoop down and attack the animal.....( )
   (2) remain absolutely silent until the animal is out of sight.....( )
   (3) fly off in all directions, as quietly as possible .....( )
   (4) all start cawing noisily.....( )

10. After the young crows have left the nest, they
   (1) frequently refuse to eat unless their food is carefully washed for them..( )
   (2) are extremely independent and insist on getting their own food as early as they possibly can.....( )
   (3) try to get their parents to feed them as long as possible.....( )
   (4) frequently kill each other unless they are carefully guarded by their parents .....( )

11. A Department of Agriculture report devotes three pages to a list of
   (1) crops which crows damage.....( )
   (2) food which crows eat.....( )
   (3) materials which crows use for making nests .....( )
   (4) districts in which crows nest.....( )

12. The crow is able to open clams and oysters
   (1) with its powerful beak.....( )
   (2) by dropping rocks on them.....( )
   (3) by dropping them on rocks.....( )
   (4) by pounding them with small stones .....( )

13. Experts believe that crows are
   (1) more numerous than ever.....( )
   (2) decreasing slowly, but will probably never disappear entirely.....( )
   (3) about as numerous today as they were when the Pilgrims landed.....( )
   (4) likely to be exterminated in the next twelve years.....( )

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10

14. Crows are said to surpass all other wild creatures except deer in their ability to
    (1) see ..... ( )
    (2) sense direction ..... ( )
    (3) smell ..... ( )
    (4) hear ..... ( )

15. It is believed that crows have a vocabulary of signals of
    (1) 5 or 6 caws ..... ( )
    (2) about 25 caws ..... ( )
    (3) 70 or 80 caws ..... ( )
    (4) over 100 caws ..... ( )

16. Crows spend much of their time
    (1) fighting ..... ( )
    (2) sleeping ..... ( )
    (3) hiding from their enemies ..... ( )
    (4) playing games ..... ( )

17. When a crow is being tried for a violation of a law of the flock
    (1) he is isolated from the flock ..... ( )
    (2) he acts as his own lawyer and defends himself ..... ( )
    (3) his friends act as his lawyers and defend him ..... ( )
    (4) he sits in the center of the flock carefully guarded by the others ..... ( )

18. During the winter months, crows
    (1) fly south in separate pairs and spend the winter in small groups ..... ( )
    (2) return to long-established winter roosts ..... ( )
    (3) gather in large flocks and spend the winter together in the vicinity of their spring nests ..... ( )
    (4) fly about in pairs wherever they can find food ..... ( )

19. Because of his eating habits the influence of the crow upon agriculture is
    (1) much more harmful than beneficial ..... ( )
    (2) almost entirely beneficial ..... ( )
    (3) about as much harm as good ..... ( )
    (4) much more beneficial than harmful ..... ( )

20. A crow is said to be responsible for the introduction of
    (1) harness bells ..... ( )
    (2) starting bells at race tracks ..... ( )
    (3) blinders on horses ..... ( )
    (4) the Kentucky Derby ..... ( )

Wait for the signal before going on.

SCORE
NUMBER RIGHT:
ITEMS 1-20 .....

PART 2: VOCABULARY

DIRECTIONS: Each item in this test consists of a definition followed by five words, one of which fits the definition. Work rapidly, but carefully.

IF THE ANSWERS ARE TO BE RECORDED IN THIS BOOKLET, find the word defined, underline it, and place its number in the parentheses at the right. Study the following example:

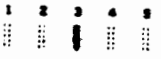
Sample: A short story used to teach some truth or moral lesson

(1) novel (2) tradition (3) parable
(4) epic (5) sermon.....(3)

IF THE ANSWERS ARE TO BE RECORDED ON SEPARATE ANSWER SHEETS, read each item, find the word defined, note its number, and blacken the space corresponding to the number on the answer sheet with the special pencil which your examiner gave you. Make *heavy, black, glossy marks.* Study the example.

Sample: A short story used to teach some truth or moral lesson

(1) novel (2) tradition (3) parable
(4) epic (5) sermon.....



Space number 3 has been blackened because "A short story used to teach some truth or moral lesson" is a parable.

Your first answer is to be recorded in space number 21 of the answer sheet even if you did not finish all of the questions on the previous part.

If you have any questions about the directions, *ask them now;* if not, wait for the signal to turn to the next page.

12

21. Group of persons united for some purpose
(1) clan (2) organization (3) brotherhood (4) partnership (5) religion..( )

22. A soft shoe or sandal of deerskin or other leather worn by North American Indians
(1) wattle (2) moccasin (3) sac (4) monolith (5) slipper.....( )

23. A group of sentences which belong together
(1) paragraph (2) declension (3) auxiliary (4) poem (5) anthem.....( )

24. A word used instead of a noun
(1) adverb (2) conjunction (3) pronoun (4) subjunctive (5) adjective....( )

25. A substance giving off a sweet smell when burned
(1) furze (2) delft (3) lappet (4) incense (5) pillion.....( )

26. A claim on property given to a person who has loaned money to protect him in case the money is not repaid when due
(1) insurance (2) mortgage (3) debt (4) depreciation (5) bill.....( )

27. The circulation of fresh air through a room so as to replace foul air
(1) filtration (2) illumination (3) elimination (4) ventilation
(5) atmosphere .....( )

28. Reddish brown coating on iron and steel formed by oxidation
(1) shellac (2) lubricant (3) temper (4) scale (5) rust.....( )

29. The rubbing of one thing against another
(1) friction (2) osmosis (3) fusion (4) abrasion (5) oxidation.....( )

30. Long pole of wood or steel set upright on a ship to hold the sails and rigging
(1) rudder (2) halyard (3) mast (4) hawser (5) boom.....( )

31. A word used in asking a question
(1) declarative (2) interrogative (3) subjunctive (4) idiom (5) interjection.( )

32. Distance around a circle
(1) diameter (2) radius (3) pi (4) circumference (5) perimeter.....( )

33. The band of colors formed when a beam of light is broken up by being passed through a prism or by some other means
(1) stratum (2) pigment (3) spectrum (4) magnetic field (5) lamina.....( )

34. A number which is to be multiplied
(1) product (2) aliquot (3) multiplicand (4) addend (5) multiplier.....( )

Go on to the Next Page

35. A trial or test to find out something
(1) experiment (2) logic (3) deliberation (4) exploration (5) inference..( )

36. The art or science of finding a ship's position and course
(1) navigation (2) direction (3) compass (4) meridian (5) location.....( )

37. The power or right of refusing to approve a legislative enactment
(1) veto (2) pardon (3) impeachment (4) edict (5) recall.....( )

38. Syllable, syllables, or word put at the beginning of a word to change its meaning
(1) prefix (2) hyphen (3) stem (4) suffix (5) phrase.....( )

39. The amount taken off the price
(1) selling price (2) commission (3) share (4) formula (5) discount.....( )

40. To begin a line of print further from the edge than the other lines
(1) invert (2) omit (3) indent (4) delete (5) revise.....( )

41. Word that means the same as or nearly the same as another word
(1) homonym (2) idiom (3) antonym (4) synonym (5) analogy.....( )

42. A fight against government
(1) anarchy (2) rebellion (3) propaganda (4) massacre (5) communism...( )

43. The ringing of a bell at a fixed hour in the evening as a signal to put out fires and lights
(1) taps (2) reveille (3) curfew (4) toll (5) vespers.....( )

44. Deciding what disease a person has by studying his symtoms
(1) diagnosis (2) corroboration (3) consideration (4) emaciation
(5) disinfection .....( )

45. Beliefs, opinions, customs or stories handed down from parents to children
(1) endowment (2) tradition (3) covenant (4) heredity (5) patronage.....( )

46. The sum of the sides of a polygon
(1) area (2) boundary (3) circumference (4) perimeter (5) margin.....( )

47. A fear spreading throughout a multitude of people so that they lose control of themselves
(1) treason (2) propaganda (3) flight (4) panic (5) retreat.....( )

48. The system of inserting marks in writing or printing to make the meaning clear
(1) apostrophe (2) punctuation (3) objective (4) sequence (5) interjection.( )

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49. The hardened remains or trace of an animal or plant
(1) nodule (2) chromatin (3) microphyle (4) mineral (5) fossil.....( )

50. An expression consisting of two terms
(1) equation (2) binomial (3) bilateral (4) dual (5) biannual.....( )

51. A number obtained by dividing one number by another
(1) dividend (2) quotient (3) divisor (4) product (5) remainder.....( )

52. An instrument for making distant objects appear nearer and larger
(1) stereoscope (2) microscope (3) reading glass (4) periscope
(5) telescope .....( )

53. The means by which relations between nations are managed
(1) assessment (2) acquisition (3) intervention (4) diplomacy
(5) enforcement .....( )

54. Short, wise saying used for a long time by many people
(1) myth (2) parable (3) lyric (4) legend (5) proverb.....( )

55. Property of a conductor that opposes the passage of an electric current
(1) repulsion (2) discharge (3) electrode (4) ionization (5) resistance...( )

56. Place where water is collected and stored for use
(1) pumping station (2) reservoir (3) water main (4) lake (5) dam.....( )

57. Dampness or moistness
(1) aridity (2) phosphorescence (3) dew point (4) evaporation
(5) humidity .....( )

58. The size of a plan or map compared with the size of what it represents
(1) scale (2) area (3) diameter (4) proportion (5) breadth.....( )

59. A violent contraction of the muscles
(1) mottle (2) relaxation (3) convulsion (4) repletion (5) convolution...( )

60. One of the six great masses of land on the earth
(1) continent (2) equatorial belt (3) hemisphere (4) mainland
(5) arctic zone.....( )

61. Verse of a poem
(1) rhyme (2) quatrain (3) canto (4)epic (5) stanza.....( )

62. The side of a right triangle opposite the right angle
(1) base (2) tangent (3) diagonal (4) hypotenuse (5) altitude.....( )

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15

63. Plane figure having eight angles and eight sides
(1) quadrilateral (2) pentagon (3) octagon (4) decagon (5) hexagon....( )

64. Person who carries messages and makes announcements
(1) baton (2) herald (3) servant (4) foulard (5) jester.....( )

65. Union formed by agreement
(1) tyranny (2) alliance (3) resignation (4) annexation (5) surrender....( )

66. A single happening or group of happenings in a story
(1) episode (2) chapter (3) calamity (4) epilogue (5) preface.....( )

67. A machine for cleaning out or deepening a channel
(1) drill (2) hamper (3) dredge (4) bulldozer (5) schooner .....( )

68. A written grant of certain rights by a ruler or by a legislature
(1) edict (2) law (3) charter (4) inscription (5) decree.....( )

69. One or more persons sent, usually to the ruler or government of a country, with authority to make some special arrangement
(1) espionage (2) confederation (3) convention (4) embassy (5) army....( )

70. Reliable or genuine
(1) coherent (2) concise (3) scholarly (4) authentic (5) versatile.....( )

71. A detailed list of goods with their estimated worth
(1) inventory (2) merchandise (3) bill of lading (4) invoice (5) property.( )

72. Place where the water is shallow
(1) rapids (2) eddy (3) bay (4) reef (5) shoal.....( )

73. Unreasoning fear of what is unknown or mysterious
(1) terror (2) suspicion (3) superstition (4) alarm (5) cowardice.....( )

74. Buying and selling in large amounts between different places
(1) barter (2) exchange (3) commodity (4) commerce (5) industry.....( )

75. A final proposal or statement of conditions
(1) command (2) reenforcement (3) fiat (4) impressment (5) ultimatum..( )

76. Equality in weight, amount, force, or effect
(1) balance (2) gravity (3) pressure (4) buoyancy (5) atomic weight...( )

77. Of unknown authorship or agency
(1) anonymous (2) journalistic (3) ambiguous (4) hackneyed
(5) stereotyped .....( )

Go on to the Next Page

16

78. A four-sided plane figure with four right angles
(1) hexagon (2) trapezoid (3) quadrilateral (4) pyramid (5) rectangle..( )

79. One skilled in a number of languages beside his own
(1) diplomat (2) interpreter (3) grammarian (4) educator (5) linguist..( )

80. A band of gold, jewels, or flowers worn around the head as an ornament
(1) halbert (2) frieze (3) demijohn (4) replica (5) tiara.....( )

Wait for the Signal Before Going on

SCORE
NUMBER RIGHT:
ITEMS 21-80 .....

PART 3: COMPREHENSION

DIRECTIONS: This test consists of a series of passages on different topics. Each passage is followed by several questions. These questions concern the main ideas in the passages, important facts which are given, the order of events, and conclusions you can reasonably draw from the ideas in the passages. You are to *read each passage and then try to answer the questions which follow it.* If you do not remember the answer to a question, you may reread the passage to find it, but you will be able to complete the test more rapidly if you read carefully enough to answer the questions at once.

IF THE ANSWERS ARE TO BE RECORDED IN THIS BOOKLET, you are to choose the one of the four possible answers to each question that is correct, and place the number of that answer in the parentheses at the right. Study the following example.

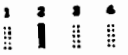
Sample: The main idea of paragraph 1 in *Directions* is that:

(1) this is a test of vocabulary .....( )
(2) you are to read passages and answer questions on their meanings (2)
(3) you are to read each passage more than once.....( )
(4) this is a test to see how rapidly you can read.....( )

IF THE ANSWERS ARE TO BE RECORDED ON SEPARATE ANSWER SHEETS, you are to choose the one of the four possible answers to each question that is correct, note its number, and blacken the position corresponding to the number on the answer sheet with the special pencil which your examiner gave you. Make *heavy, black, glossy marks.* Study the following example:

Sample: The main idea of paragraph 1 in *Directions* is that:

(1) this is a test of vocabulary
(2) you are to read passages and answer questions on their meanings
(3) you are to read each passage more than once
(4) this is a test to see how rapidly you can read



Notice that the space under number two has been marked because the correct answer, "you are to read passages and answer questions on their meanings," has that number.

Your first answer is to be recorded on space 81 of the answer sheet even if you did not finish all of the questions in the vocabulary test.

If you have any questions about the directions, *ask them now;* if not, wait for the signal to turn to the next page.

20

he found him free from all rebelliousness and only impatient for the course, he let him go at full speed, inciting him now with a commanding voice, and urging him also with his heel.

Philip and his friends looked on at first in silence and anxiety for the result, till seeing him turn at the end of his career and triumphing for what he had performed, they all burst into acclamations of applause; and his father shedding tears, it is said, for joy, kissed him as he came down from his horse, and in his transport, said, "O my son, look thee out a kingdom equal to and worthy of thyself, for Macedonia is too little for thee."[2]

86. The main idea of the whole passage is that

(1) Bucephalus was a horse hard to manage.....( )
(2) Philonicus played a trick on Philip by trying to sell him an unmanageable horse.....( )
(3) Alexander showed that Bucephalus could not be kept in a small country like Macedonia.....( )
(4) Alexander proved his horsemanship.....( )

87. The main idea of the last paragraph is that

(1) Alexander's father shed tears over the event.....( )
(2) the people watching Alexander applauded him.....( )
(3) anxiety turned to joy at Alexander's success.....( )
(4) Alexander came to the end of his career.....( )

88. When Alexander rode

(1) he used his voice and heel to urge Bucephalus on.....( )
(2) he brought the horse out of the bright sunlight.....( )
(3) he found Bucephalus too impatient to learn easily.....( )
(4) he gave the horse a few gentle strokes with his riding stick ( )

89. When the ride was over

(1) Alexander no longer had to work for a living.....( )
(2) Alexander's father said his son was too good for Macedonia .....( )
(3) Alexander's father drove him from the kingdom.....( )
(4) Alexander's father greeted him from his transport plane ( )

90. A conclusion which can be drawn from this passage is that

(1) Alexander's father was proud of him.....( )
(2) good horsemen make good kings.....( )
(3) Bucephalus was an unusually intelligent horse.....( )
(4) Philip and his friends were cowards.....( )

21

MARS, OBJECT OF SPACE PROBE

If you saw a brilliant star in the sky shining with a distinct reddish or orange red light, it would be Mars, Earth's neighbor planet. Because it is red, a color which has always been associated with war and destruction, this planet was named after Mars, the great god of war. Mars, legendary father of the Romans through his son Romulus – founder of Rome – according to ancient myths was highly honored and worshiped as the god of the blood red battle field.

Astronomers have been especially interested in Mars. When at the point in its orbit nearest the earth, it is only 48.6 million miles away and clearly visible to the unaided eye. Through a telescope it appears as a broad red globe resembling a fiery orange. At the poles patches of white are seen. This has led some astronomers to believe that the poles are covered with ice and snow. The rest of the surface of Mars has a reddish color except for dark greenish-blue patches. Markings which appear to be definite lines are also seen on this planet. These lines are spoken of as "canals," and their arrangement has led some astronomers to wonder whether they were not built by beings similar to ourselves.

Mars has two moons, one of which travels so fast in its orbit that it goes around the planet three times each day. It rotates on its axis once in 24 hours and 37 minutes, making a day there just 37 minutes longer than a day on earth.

Photographs sent back to Earth by Mariner IV have not completely eliminated the possibility of biological life on Mars. The space probe has sustained the possibility of water vapor, seasonal changes in vegetation and polar ice caps. Evidently the mean temperature of the red planet differs very little from that of Earth's Antarctica. Dr. Norman H. Horowitz of the California Institute of Technology points out that there are microbes and some flowering plants living in the cold climates of the Antarctic. However, other scientists doubt the existence of life because of lack of oxygen, scarcity of water, low atmospheric density and bombardment by solar and cosmic rays. Dr. Horowitz reminds us that plants and animals can and do adapt to hostile conditions. Thus the argument goes on regarding life, as we know it, on Mars. The final answer may depend upon information from future space probes.[8]

91. The main idea of the first paragraph is that
    (1) Mars is a planet named after the Roman God of War ( )
    (2) Mars is a reddish planet which can be seen with the naked eye ( )
    (3) Mars is a largely reddish planet whose colors and markings are of special interest to astronomers ( )
    (4) Mars is a white planet with red poles, greenish-blue patches, and probably man-made canals ( )

Go on to the Next Page

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92. The main idea of the last paragraph is that
(1) the possibility of life on Mars has not been eliminated by space probes ( )
(2) the temperature of Antarctica is warmer than the average temperature of Mars ( )
(3) the space probes have proved that life does not exist on Mars ( )
(4) there can be no life on Mars because of the lack of oxygen and water ( )

93. The patches of white on Mars are thought by some astronomers to be
(1) clouds of white vapor and gas ( )
(2) snow covered mountain peaks ( )
(3) snow covered poles ( )
(4) the north pole of Mars ( )

94. One of the moons of Mars travels around the planet three times in a
(1) year ( )
(2) month ( )
(3) week ( )
(4) day ( )

95. Astronomers could determine the length of a day on Mars by noting the
(1) changing location of its poles ( )
(2) speed with which the moons of Mars revolve around it. ( )
(3) time it takes for Mars to rotate on its axis ( )
(4) time it takes for the moons to go around Mars ( )

CHANGES IN AGRICULTURE

The great industrial changes brought on by the development of machinery have greatly affected American agriculture. After 1865 agriculture became more commercialized: the farmer obtained many of the things he needed from manufacturing centers. The farm area greatly increased, and prior to 1914 farm products were the most important part of the export trade. This was true especially in the period of the 1880's and 1890's, when farm surpluses were sent abroad to pay for our imports.

THE NEW AGRICULTURE. Following the War between the North and the South, agriculture had to undergo considerable change. The farmer, during the colonial period, produced largely for a home market, and the farm was usually a self-sufficient unit. Nearly all of the food, wearing apparel, and other materials needed by the farmer and his family were produced either on the farm or in the local community. After the war, however, the farmer produced more crops to be sold in other parts of the

nation and in foreign countries. Farming had become more of a commercial enterprise. The farmer harvested his crop and produced his products not for himself alone, but also for the rest of the world.

This change came about largely because of the rise of the industrial system, which built up factories in large cities whose population had to get most of its food supply from the farmer, while the manufacturing centers produced machinery and other products which the farmer bought.[4]

96. The main idea of the first paragraph is that
    (1) the great industrial changes brought on by the development of machinery have greatly affected American agriculture ( )
    (2) by 1914 farm products had become the most important part of America's export trade ( )
    (3) the period of the 1880's and 1890's saw a tremendous increase in the export of farm products ( )
    (4) in the 1880's and 1890's, especially, American agriculture was greatly expanded by activities in the foreign market ( )

97. The main idea of the second paragraph is that
    (1) during the colonial period, farms were usually self-sufficient units ( )
    (2) after the War between the North and South, most of the farmers' crops were sold ( )
    (3) following the War between the North and South, agricultural methods were greatly changed ( )
    (4) after 1865, the farmer changed from a producer for a home market to a producer for both home and world markets ( )

98. The growth of industry and cities brought about
    (1) great industrial changes ( )
    (2) a need for more food and wearing apparel ( )
    (3) expansion of farmers' markets ( )
    (4) self-sufficiency for farms ( )

99. The needs of the colonial farmer were fulfilled by
    (1) commercial enterprises in the cities ( )
    (2) his farm and local community ( )
    (3) the foreign market ( )
    (4) the home market ( )

100. The growth of cities in America
    (1) created both goods and a market ( )
    (2) produced a need as well as self-sufficiency ( )
    (3) forced a foreign market for farm goods ( )
    (4) caused the neglect of the local community ( )

SCORE
NUMBER RIGHT:
ITEMS 1-20
PLUS 81-100 .....

APPENDIX D

Survey of Study Habits and Attitudes

Form C

GRADES 12-14

SSHA

Survey of Study Habits and Attitudes

Brown—Holtzman

Do not open this booklet until you are told to do so. Wait for the examiner's instructions.

DO NOT MAKE ANY MARKS IN THIS BOOKLET

The Psychological Corporation, 304 East 45th Street, New York, N. Y. 10017

Printed in U.S.A. 70-206TB

DIRECTIONS

The purpose of this survey is to furnish an inventory of study habits and attitudes to serve as a foundation for self-improvement. If taken seriously, this inventory can help you obtain a better understanding of how to study properly. If you will honestly and thoughtfully mark all of the statements on the pages that follow, you will be able to learn many of your study faults. The value of this survey to you will be in direct proportion to the care with which you mark each statement. Since your answers will be treated with the strictest confidence, feel free to answer all questions frankly.

You will mark your answers on a separate answer sheet. Make no marks on this booklet. There are 100 statements in this questionnaire. For each statement a five-point scale is provided for indicating whether you rarely, sometimes, frequently, generally, or almost always do or feel as the statement suggests. You are to rate yourself on each statement by marking the space on your answer sheet that represents your answer choice. Thus, for example, you would mark space R on your answer sheet if you *rarely* follow the procedure described or if you feel that the statement is *rarely* true for you. In marking your answers, be sure that the number of the statement agrees with the number on the answer sheet. Make sure that your marks are heavy and black. Make no stray marks on the answer sheet and erase completely any mark that you wish to change.

To aid you in answering this questionnaire, the terms have been defined on a percentage basis as follows:

R - RARELY means from 0 to 15 per cent of the time.
S - SOMETIMES means from 16 to 35 per cent of the time.
F - FREQUENTLY means from 36 to 65 per cent of the time.
G - GENERALLY means from 66 to 85 per cent of the time.
A - ALMOST ALWAYS means from 86 to 100 per cent of the time.

Remember, you are asked to rate yourself, not in accordance with what you think you *should* do or feel, or as you think *others* might do or feel, but as you yourself are in the habit of doing and feeling. When you cannot answer a statement on the basis of actual experience, mark the statement according to what you would be most likely to do if the situation should arise.

There are no "right" or "wrong" answers to these statements, and there is no time limit for this questionnaire. Work as rapidly as you can without being careless, and do not spend too much time on any one statement. Please do not omit any of the statements.

R—RARELY S—SOMETIMES F—FREQUENTLY G—GENERALLY A—ALMOST ALWAYS

1. When my assigned homework is extra long or unusually difficult, I either quit in disgust or study only the easier parts of the lesson.
2. In preparing reports, themes, term papers, etc., I make certain that I clearly understand what is wanted before I begin work.
3. I feel that teachers lack understanding of the needs and interests of students.
4. My dislike for certain teachers causes me to neglect my school work.
5. When I get behind in my school work for some unavoidable reason, I make up back assignments without prompting from the teacher.
6. Difficulty in expressing myself in writing slows me down on reports, themes, examinations, and other work to be turned in.
7. My teachers succeed in making their subjects interesting and meaningful to me.
8. I feel that I would study harder if I were given more freedom to choose courses that I like.
9. Daydreaming about dates, future plans, etc., distracts my attention from my lessons while I am studying.
10. My teachers criticize my written reports as being hastily written or poorly organized.
11. I feel that teachers allow their personal like or dislike for a student to influence their grading unduly.
12. Even though I don't like a subject, I still work hard to make a good grade.
13. Even though an assignment is dull and boring, I stick to it until it is completed.
14. I give special attention to neatness on themes, reports, and other work to be turned in.
15. I believe that the easiest way to get good grades is to agree with everything your teachers say.
16. I lose interest in my studies after the first few days of a new semester.
17. I keep all the notes for each subject together, carefully arranging them in some logical order.
18. I memorize grammatical rules, definitions of technical terms, formulas, etc., without really understanding them.
19. I think that teachers like to exercise their authority too much.
20. I believe that teachers truly want their students to like them.
21. When I am having difficulty with my school work, I try to talk over the trouble with the teacher.
22. I hesitate to ask a teacher for further explanation of an assignment that is not clear to me.
23. I feel that teachers are too rigid and narrow-minded.
24. I feel that students are not given enough freedom in selecting their own topics for themes and reports.
25. I lay aside returned examinations, reports, and homework assignments without bothering to correct errors noted by the instructor.
26. I get nervous and confused when taking an examination and fail to answer questions to the best of my ability.
27. I think that teachers expect students to do too much studying outside of class.
28. Lack of interest in my school work makes it difficult for me to keep my attention focused on assigned reading.
29. I keep my place of study business-like and cleared of unnecessary or distracting items such as pictures, letters, mementos, etc.
30. I have trouble with the mechanics of English composition.
31. When explaining a lesson or answering questions, my teachers use words that I do not understand.
32. Unless I really like a course, I believe in doing only enough to get a passing grade.
33. Telephone calls, people coming in and out of my room, "bull-sessions" with my friends, etc., interfere with my studying.

GO ON TO THE NEXT PAGE.

R—RARELY S—SOMETIMES F—FREQUENTLY G—GENERALLY A—ALMOST ALWAYS

34. In taking notes, I tend to take down material which later turns out to be unimportant.

35. My teachers fail to give sufficient explanation of the materials they are trying to teach.

36. I feel confused and undecided as to what my educational and vocational goals should be.

37. It takes a long time for me to get warmed up to the task of studying.

38. I do poorly on tests because I find it hard to think clearly and plan my work within a short period of time.

39. I feel that teachers are overbearing and conceited in their relations with students.

40. Some of my courses are so uninteresting that I have to "force" myself to do the assignments.

41. I am unable to concentrate well because of periods of restlessness, moodiness, or "having the blues."

42. I skip over the figures, graphs, and tables in a reading assignment.

43. I believe that teachers secretly enjoy giving their students a "hard time."

44. I believe that having a good time and getting one's full share of fun out of life is more important than studying.

45. I put off writing themes, reports, term papers, etc., until the last minute.

46. After reading several pages of an assignment, I am unable to recall what I have just read.

47. I think that teachers tend to talk too much.

48. I believe that teachers tend to avoid discussing present-day issues and events with their classes.

49. When I sit down to study I find myself too tired, bored, or sleepy to study efficiently.

50. I have difficulty in picking out the important points of a reading assignment—points that later appear on examinations.

51. I feel that teachers try to distribute their attention and assistance equally among all their students.

52. I feel that my grades are a fairly accurate reflection of my ability.

53. I waste too much time talking, reading magazines, listening to the radio, watching TV, going to the movies, etc., for the good of my studies.

54. When in doubt about the proper form for a written report, I refer to an approved model to provide a guide to follow.

55. The illustrations, examples, and explanations given by my teachers are too dry and technical.

56. I feel that it is not worth the time, money, and effort that one must spend to get a college education.

57. My studying is done in a random, unplanned manner—is impelled mostly by the demands of approaching classes.

58. When reading a long textbook assignment, I stop periodically and mentally review the main points that have been presented.

59. I feel that teachers tend to be sarcastic towards their poorer students and to ridicule their mistakes excessively.

60. Some of my classes are so boring that I spend the class period drawing pictures, writing letters, or daydreaming instead of listening to the teacher.

61. "Extracurricular activities"—dating, clubs, athletics, fraternity and sorority activities, etc.—cause me to get behind in my school work.

62. I seem to accomplish very little in relation to the amount of time I spend studying.

63. I feel that teachers make their courses too difficult for the average student.

64. I feel that I am taking courses that are of little practical value to me.

65. I utilize the vacant hours between classes for studying so as to reduce the evening's work.

66. I can concentrate on a reading assignment for only a short while before the words become a meaningless jumble.

67. I think that football coaches contribute more to school life than do the teachers.

GO ON TO THE NEXT PAGE.

R—RARELY S—SOMETIMES F—FREQUENTLY G—GENERALLY A—ALMOST ALWAYS

68. I believe that the sole purpose of education should be to equip students to make a living.

69. Problems outside of school—financial difficulties, being in love, conflict with parents, etc.—cause me to neglect my school work.

70. I copy the diagrams, drawings, tables, and other illustrations that the instructor puts on the blackboard.

71. I feel that teachers think too much about grades and lose sight of the real objectives of education.

72. I strive to develop a sincere interest in every course I take.

73. I complete my homework assignments on time.

74. I lose points on true-false or multiple-choice examinations because I change my original answer only to discover later that I was right the first time.

75. I think that students who ask questions and offer comments in class are only trying to impress the teacher.

76. The prestige of having a college education provides my main motive for going to college.

77. I like to have a radio, record player, or television set turned on while I'm studying.

78. When preparing for an examination, I arrange facts to be learned in some logical order—order of importance, order of presentation in class or textbook, order of time in history, etc.

79. I believe that teachers intentionally schedule tests on the days following important athletic or social activities.

80. I believe that a college's football reputation is just as important as its academic standing.

81. With me, studying is a hit-or-miss proposition depending on the mood I'm in.

82. I am careless of spelling and the mechanics of English composition when answering examination questions.

83. I believe that one way to get good grades is by using flattery on your teachers.

84. I think that it might be best for me to drop out of school and get a job.

85. I study three or more hours per day outside of class.

86. Although I work until the last possible minute, I am unable to finish examinations within the allotted time.

87. I feel that it is almost impossible for the average student to do all of his assigned homework.

88. I feel that the things taught in school do not prepare one to meet adult problems.

89. I keep my assignments up to date by doing my work regularly from day to day.

90. If time is available, I take a few minutes to check over my answers before turning in my examination paper.

91. I feel that the ridiculous assignments made by teachers are the main reason for student cheating.

92. Prolonged reading or study gives me a headache.

93. I prefer to study my lessons alone rather than with others.

94. When tests are returned, I find that my grade has been lowered by careless mistakes.

95. I feel that students cannot be expected to like most teachers.

96. I feel like cutting classes whenever there is something I'd rather do or whenever I need to cram for a test.

97. At the beginning of a study period I organize my work so that I will utilize the time most effectively.

98. During examinations I forget names, dates, formulas, and other details that I really do know.

99. I believe that teachers enter their profession mainly because they enjoy teaching.

100. I believe that grades are based upon a student's ability to memorize facts rather than upon the ability to "think" things through.

APPENDIX E

Leaders' Manual
Self-modification
Groups

Session 1. P.1

1. Handout the following:
   (a) timetable sheets - 2 each
   (b) student code number to each student
   (c) assignment sheet no. 1

2. Tell the students that they are to record all behavior performed during the nest week, starting today, on the timetable sheet.

   Note that it will be easy for them to forget so you will help them to remember using a process known as covert behavioral rehearsal. Say:

   OK - settle back in your chair, close your eyes, relax. Flop your legs...lift them and let them drop...let your arms drop...relax your shoulders...take a deep breath and let it out...relax your stomach. Pay attention only to my voice. Let yourself really relax...all the way.

   OK - now imagine you are just about to sit down for supper. Picture it vividly in you mind. Got it?...good! OK,now imagine that your food is there in front of you - you pick up your fork and just as you are about to eat, you remember your timetable. You put down your fork, take out the timetable, and fill it in, and you pat yourself on the back for remembering.

   OK - let's do it once more.... (Repeat)

   OK - don't forget then, keep the timetable with you all the time, and every time you go to eat, remember to bring it up to date.

3. Note that a behavior can't be changed properly unless we know what it is now and what we want it to change to.

   Go over assignment No. 1 step by step. Note that in step 2 they should read "Studying Textbooks" from Morgan and Deese.

   Explain that a behavioral definition is one which permits anyone to be able to see if the behavior is being performed or not, and usually includes a method for counting or measuring it.

Session 2. P. 2.

4. BM group only!! Call for questions, mention that they will be spending some time in groups helping one another with their projects.

   CM group only!! Hand out "Self-statement sheet", and instruct students to start a list of self-statements that result in study avoidance or study escape. Give some examples. Start list of statements that cue study.

5. Both groups. Remind students that timetables and assignment 1 will be picked up next week.

Session 2.

1. Timetables. Make sure students have code number, and total number of hours studied on timetable. Collect timetables, hand out new ones.

2. Hand out task 1.

3. Break class in to groups of 6 to 8. Have them discuss their study problems. Have the groups try to help each other to express the problems in terms of behaviors

   CM group only. Have the students also discuss their list of study avoidance cuing self-statements, and the consequences. Make a special note of the postive and the negative reinforcing effect of study avoidance behavior, and of study avoidance cognitions.

4. Go over task 1 step by step.

5. Cognitive group only. Continue to develop first two columns on self-statement sheet.

6. Collect assignment no. 1.

7. Remind students that timetables and task 1 will be collected next week.

Seesion 3.

1. Collect timetables, check code nos. Handout new time tables. Collect task 1.

2. Return Assignment 1, timetable 1.

3. Review "ABCs" of behavior modification. Hand out task 2. Review stimulus control.

4. Go over task 2 step by step.

5. Break class into groups to discuss analysis of study problem.

6. Remind class that timetables and task 2 are to be collected next week.

Session 4.

1. Collect timetables, check code nos. Handout new time tables. collect task 2.

2. Return task 1, timetable 2.

3. Review "ABCs" of behavior. Hand out task 3. Review consequences of behavior.

4. Go over task 3 step by step.

5. Break class up into groups to discuss reinforcers that they may find useful.

   CM group only. Note the importanceof self-praise. Check that self-statement sheets are up-to-date.

6. Review satiation and importance of a menu. Review levels of value of reinforcers and emphasize importance of fitting the reinforcer to the value of the behavior performed. Ask for examples of weak, medium, strong.

7. Remind class that timetables and task 3 are to be collected next week.

Session 5.

1. Collect timetables, check code nos. Hand out new time tables. Collect task 3.

2. Return task 2, timetable 3.

3. Review ABCs of behavior. Hand out task 4 .

4. Go over task 4 step by step.

5. Break class up into groups to discuss contract.

   CM group only. Go over study avoicance cues, demonstrate coping self-statements, review self-praise.

6. Review importance of record keeping, call for strategies for remembering to keep records.

7. Remind class that timetables and task 4 are to be collected next week.

Sessions 6 through 10

1. Collect timetables, check code nos., hand out new time tables.

2. Break class into groups. Have each individual describe in 2 or 3 minutes his target behaviors, the reinforcers contracted for, and the degree of success of his/her project to date. Encourage social reinforcement - applause, congratulations etc.

   Have individuals experienceing difficulty describe their program in detail, and use other members of their group as resource/helpers in trouble shooting.

   If no one having difficulty, have one person describe his/her program inddetail, and have others question, suggest, etc

3. CM group only. Covert behavioral rehearsal of coping self-statements. Say:

   OK, we're going to do some covert behavioral rehearsal. I want you to get as comfortable as you can...sit back in your chair and get nice and loose...close your eyes ...lift your heels off the groundaa few inches, and let them drop...lift your arms and just let them drop into your lap... shrug your shoulders and let them drop... roll your head around and get your neck relaxed...take a deep breath...and let it out...take another deep breath... and when you let it out, let yourself really relax... let yourself really go...relax as deeply as you can...check over your body, and if you sense any tense muscles, let them relax...

   OK, now imagine yourself in the situation just before it is time for you to start studying...imagine telling yourself one of your study avoidance self-statements... Now imagine yourself countering that cue with a coping self-statement;;.imagine yourself overcoming your study avoidance cue, and imagine yourself feeling good about your success.

   Now imagine going to the place where you study...imagine getting started studying...imagine you're having a bit of trouble getting into it, and you emit one of your

study escape cues...imagine countering it with a coping self-statement, and resuming studying...and feeling good about your success,

Now imagine that you've completed your studies, and you feel very satisfied with your efforts...relax and enjoy that good feeling...

(let them relax for about a minute or so)

4. Remind the students that they should keep their records up to date, and hand them in each week. Remind them that if they run into problems they should contact either one of their group members or one of the leaders.

APPENDIX F

Task Sheets
Cognitive Modification
Treatment

Self Directed Behavior Modification. Assignment 1

1. On the timetable form that you have been given, keep track of everything you do for the next week.
2. Mark in the timetable every time you sit down to have something to eat. Your group leader will help you to remember.

The purpose of this activity is to establish approximately how much time you study in one week. In addition, you will probably be astonished at the amount of time you use up unproductively.

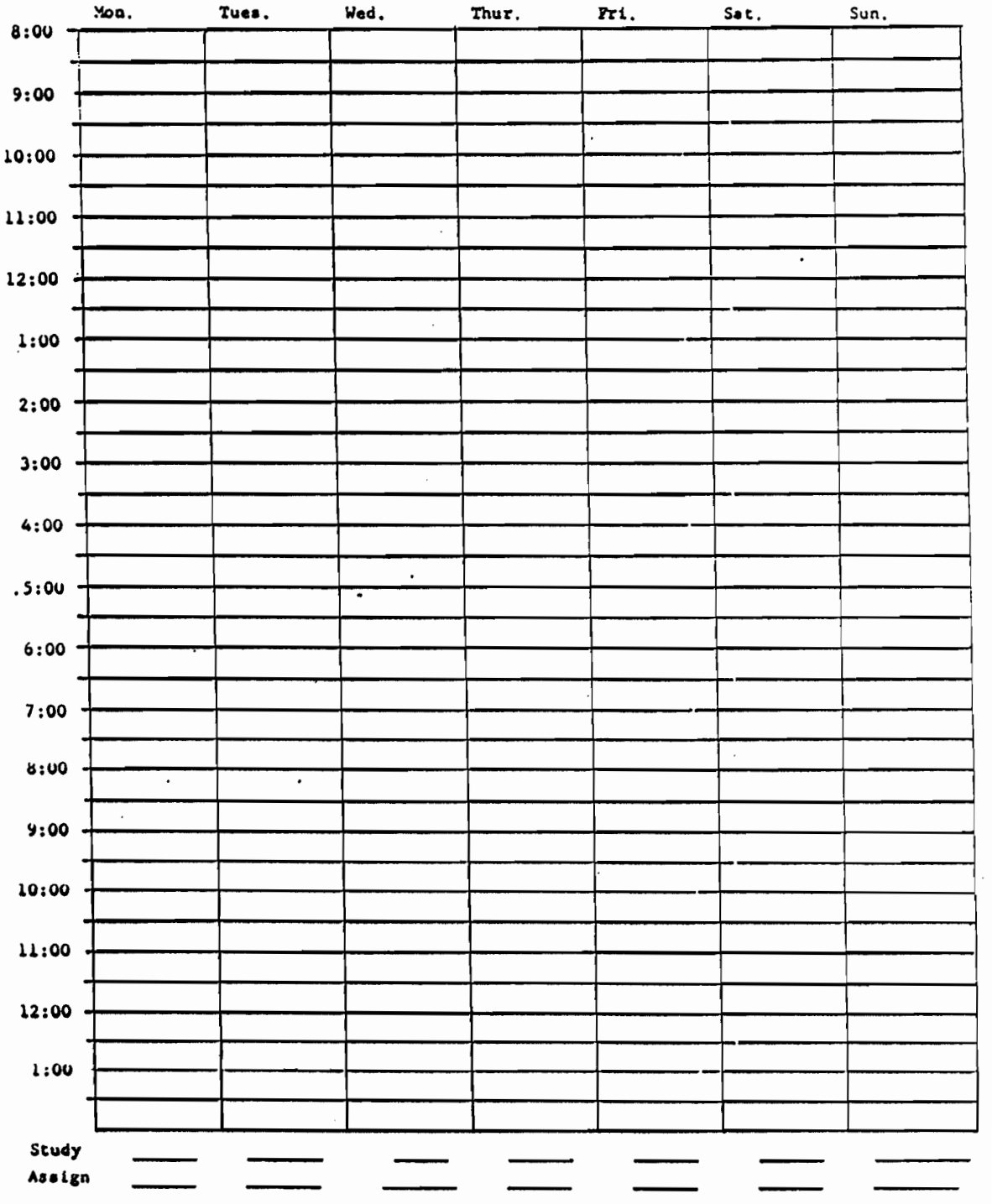
A second purpose is to identify the "soft" spots in your weekly schedule, that is, the times during the week when the competition for your time is least strong, and therefore easiest to study in.

A third purpose is to identify the activities that you prefer to engage in, in order that you may later be able to use them as reinforcers.

3. On the form provided, start a list of the thoughts you think that turn you away from studying before you get started or that get you out of studying once you have started.
4. Make another list of the thoughts that get you <u>into</u> studying, and that keep you there once you have started.

Code _____ Study Hours Scheduled _____ Total Hours Stud. ___

Hours Studied on Sched. _____ Total Hours Ass. ___



Self Statement Sheet Student code no._____

Study Avoidance Or Escape Cues	Consequences	Counter thoughts	Consequences

SELF DIRECTED BEHAVIOR MODIFICATION

TASK 1.

Make a list of your dissatisfactions with your study behavior. This list may include such things as the amount of time you (do not) spend studying, the quality of your study, the efficiency of your study, your attitude (thoughts, self-statements, etc.) toward study, etc.

State the problem in terms of specific situations in which you perform behaviors that you would like to reduce or eliminate, or specific situations in which you would like to commence or increase the frequency of performance of desirable behaviors. To be complete, the statement should include:-

1. Antecedents.
   a. describe the situation and environment prior to the perfdormance (or non-performance) of the target behavior
   b. describe the behavior chain leading up to the target behavior.
   c. describe the thoughts/self-statements prior to the performance (or non-performance) of the target behavior

2. Behavior.
   a. describe the situation during the perfromance of the target behavior
   b. describe the thoughts/self-statements which accompany the performance of the target behavior.
   c. take special note of events, behaviors, and thoughts which precede the termination of the target behavior

3. Consequences.
   a. describe the situation that prevails after the performance (or non-performance) of the target behavior both immediately after, a day later, a week later, and long term if applicable
   b. describe the behaviors performed after the performance of the T.B. (or the non-performande, naturally)
   c. describe the thoughts and self-statements made after the perfromance (or non-performance) of the T.B.

SELF MODIFICATION OF BEHAVIOR

TASK 2.

Write an analysis of your study problem. You will proabably include:-

a. the amount of time per week that you spend studying
b. the skills and/or behaviors that require altering in order to improve the efficiency of your study behavior
c. the elimination of incompatible behaviors (daydreaming, distractions, negative thoughts, etc.)
d. the rearrangement of your study environment including place, time, equipment, people, telephones, television, etc.

This analysis should indicate clearly all antecedent cues or stimuli that trigger desired and undesired behaviors, (including thoughts and feelings), the behavior that actually gets performed instead of the desired behavior, and the immediate and long term consequences of the behavior performed.

State the solution to the problem in terms of the increase in frequence of desired behavior (henceforth referred to as the target behavior or T.B.). You may also include the decrease in frequency of one or more undesired and incompatible behaviors. You must specify the situation in lwhich this behavior is to be altered. For example:-

"My objective is to:-

1. Increase the number of hours per week I spend studying on weekdays between 1900 and 2000 hrs. at home in my office from the present average of four to an average of 12, and decrease the number of hours spent watching TV and performing non-essential or low priority tasks from an average of 11 hours to an average of 3 hours per week.
2. Increase the the number of consecutive minutes of concentrated study in each study session from an average of 4 minutes to an average of 30 minutes, and decrease the amount of time spent daydreaming or engaged in distracting activities from 40 minutes per hour to 5 minutes per hour.

Describe in detail the method of recording that you plan to use remembering that it should be portable, present, simple, non-punitive, and written.

SELF-MODIFICATION OF BEHAVIOR TASK 3

1. Develop a "menu" of reinforcers that you can select from to reward yourself for successfully performing the various levels of the study behaviors you have set as objectives for yourself.

   One method is to categorize reinforcers into "weak", "medium", and "strong", and then to separate them into "things" and "activities". You can use the information taken from your weekly timetables and from the answers to the questions on the list that goes with this sheet as material for this menu.

   Remember, reinforcers must be:-

   - potent (you are willing to perform whatever behavior is required by you in order to get such a reinforcer)
   - controllable (you can deny them to yourself if you don't perform the required behavior)
   - accessible and realistic (if you perform the required behavior they will actually be available)

   Make sure that the reinforcers you put on your menu satisfy these requirements.

   It is suggested that you permit yourself to select a "weak" reinforcer for each unit of study behavior that you perform (e.g. ½ hour of study), a "medium" reinforcer if you achieve your daily objective, and a "strong" reinforcer if you achieve your weekly objective. These contingencies are to be detailed in Task 4.

   Example:-

	Things	Activities
Weak	- Munchies, - sciencefiction book	- listen to radio 15 mins. - read one short story
Medium	- pizza - new record	- watch Muppets - 1 hour hockey
Strong	- new hockey stick - part for car	- weekend skiing, Tremblant - 1 evening (sat) downtown disco

TASK 4

Be extremely detailed and specific. The more precise the better.

Contract.

I, _____ shall perform the following list of activities in order to improve my study behavior.

antecedents.
- schedule
- set one (maximum two) place to study, do only studying there
- arrange physical envioronment to give better chance for study to occur
- develop set of self-instructions to be used to trigger study behavior, and to counter study avoidance self-statements
-
-

behavior
- week by week targets gradually increasing from baseline to final goal. specify daily targets if appropriate
- self-instructions on how to study (SQ3R for example)
- list of coping self statements to be used to counter study avoidance thoughts and other distractions and copouts
-
-

consequences
- menu
- tie choice of reinforcers from menu to daily and weekly targets, make sure reinforcers received only if targets achieved. set three levels of targets
- list of reinforcing self-statements
-
-

recording procedure
- ~~dirty~~ daily, portable present, simple, non-punitive
- weekly graph posted in study area
-

Signed _____

Witness _____

APPENDIX G

Task Sheets
Behavioral Modification
Treatment

Self Directed Behavior Modification. Assignment 1

1. On the timetable form that you have been given, keep track of everything you do for the next week.
2. Mark in the timetable every time you sit down to have something to eat. Your group leader will help you to remember.

The purpose of this activity is to establish approximately how much time you study in one week. In addition, you will probably be astonished at the amount of time you use up unproductively.

A second purpose is to identify the "soft" spots in your weekly schedule, that is, the times during the week when the competition for your time is least strong, and therefore easiest to study in.

A third purpose is to identify the activities that you prefer to engage in, in order that you may later be able to use them as reinforcers.

Code _____ Study Hours Scheduled _____ Total Hours Stud. ___

Hours Studied on Sched. _____ Total Hours Ass. ___

	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.
8:00							
9:00							
10:00							
11:00							
12:00							
1:00							
2:00							
3:00							
4:00							
5:00							
6:00							
7:00							
8:00							
9:00							
10:00							
11:00							
12:00							
1:00							
Study	____	____	____	____	____	____	____
Assign	____	____	____	____	____	____	____

SELF DIRECTED BEHAVIOR MODIFICATION

TASK 1.

Make a list of your dissatisfactions with your study behavior. This list may include such things as the amount of time you (do not) spend studying, the quality of your study, the efficiency of your study, your attitude (thoughts, self-statements, etc.) toward study, etc.

State the problem in terms of specific situations in which you perform behaviors that you would like to reduce or eliminate, or specific situations in which you would like to commence or increase the frequency of performance of desirable behaviors. To be complete, the statement should include:-

1. Antecedents.
   a. describe the situation and environment prior to the perfdormance (or non-performance) of the target behavior
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2. Behavior.
   a. describe the situation during the perfromance of the target behavior
   b. describe the thoughts/self-statements which accompany the performance of the target behavior.

3. Consequences.
   a. describe the situation that prevails after the performance (or non-performance) of the target behavior both immediately after, a day later, a week later, and long term if applicable
   b. describe the behaviors performed after the performance of the T.B. (or the non-performande, naturally)

SELF MODIFICATION OF BEHAVIOR

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a. the amount of time per week that you spend studying
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2. Increase the the number of consecutive minutes of concentrated study in each study session from an average of 4 minutes to an average of 30 minutes, and decrease the amount of time spent daydreaming or engaged in distracting activities from 40 minutes per hour to 5 minutes per hour.

Describe in detail the method of recording that you plan to use remembering that it should be portable, present, simple, non-punitive, and written.

SELF-MODIFICATION OF BEHAVIOR TASK 3

1. Develop a "menu" of reinforcers that you can select from to reward yourself for successfully performing the various levels of the study behaviors you have set as objectives for yourself.

   One method is to categorize reinforcers into "weak", "medium", and "strong", and then to separate them into "things" and "activities". You can use the information taken from your weekly timetables and from the answers to the questions on the list that goes with this sheet as material for this menu.

   Remember, reinforcers must be:-

   - potent (you are willing to perform whatever behavior is required by you in order to get such a reinforcer)
   - controllable (you can deny them to yourself if you don't perform the required behavior)
   - accessible and realistic (if you perform the required behavior they will actually be available)

   Make sure that the reinforcers you put on your menu satisfy these requirements.

   It is suggested that you permit yourself to select a "weak" reinforcer for each unit of study behavior that you perform (e.g. ½ hour of study), a "medium" reinforcer if you achieve your daily objective, and a "strong" reinforcer if you achieve your weekly objective. These contingencies are to be detailed in Task 4.

   Example:-

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TASK 4

Be extremely detailed and specific. The more precise the better.

Contract.

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- schedule
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behavior
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-
-

consequences
- menu
- tie choice of reinforcers from menu to daily and weekly targets, make sure reinforcers received only if targets achieved. set three levels of targets
-
-
-

recording procedure
- ~~daily~~ daily, portable present, simple, non-punitive
- weekly graph posted in study area
-

Signed _____

Witness _____

APPENDIX H

Leader$' Manual
Group Counselling

ALEX' GROUP

COUNSELLORS - TRUDI, SU & HOWIE

SESSION 1

Goal: To establish warm emotional climate via trust building and maintenance orientation.

1) General Greeting

Exercise

a) Around the room introduction and object identification. eg."I'M Howie Eagle."

"This is , and I'm Su Cheshirecat." etc.

Do order a second time in reverse.

Eg. Person #6 becomes person #1.

2) Sharing expectations and Orientation.

Introduction by leader from global goals to specific.

a) Research project

b) Specific modules of project -behavioral -intellectual/cognitive -affect

c) We will be creating a potpourri of experiences and exercises focusing on your learning more control of what you want to happen, via

1) here& now

11) awareness and articulation of your experiences

111) what makes you the unique person you are

d) Can include "speaking to the resistance":

"I was sitting here, thinking about some of the fantasies that you may have....."

e) Open up for group expectations and questions

f) Maintenance:

Information — re times, sessions

Ground rules — confidentiality — flexibility

— participation — break

— importance of sharing — homework

— attendance — other concerns

3) Inclusion Exercise: Coat of Arms

a) Find a picture describing or expressing:

1) a happy point of your life (past)

11) something that is a very important part of you (present)

111) something that you want to happen/attain (future)

b) Divide into three triads three different times, and share, in order — a) your past image
b) your present image
c) your future image

c) Regroup, and make a past image as a group
present image as a group
future image as a group
with your personal respective images.

4) Closure

SESSION II

Goal: To further trust and group building.
To spark more individual involvement in group.
To introduce concept of dealing with the "here and now."

Materials: "This Statement Reflects Me" sheets.
Flip Chart
Markers

1. Unfinished Business:
Anything concerning what happened last week.
Thoughts and feelings about this week. 10 min.

2. This Statement Reflects Me.
a) Introduce exercise — getting to know different aspects of members.
b) Debrief — How did you like it? 20 min.

3. Alligator River
a) Introduce story — go over twice and diagram.
b) Rate best to worst individually.
c) In triads come to consensus over rating.
d) In group — come to consensus over rating.
e) Debrief — Difficult to listen when sacred values attacked.
— What behaviour was helpful in reaching consensus?
— How did you feel doing the exercise — stay with "here and now." 1 hour

SESSION III

GOALS: To introduce and develop concept of "here and now."
To experience themselves in the "here and now."
To provide an opportunity for students to take part in experiential learning.

1. Lecturette on awareness and zones of awareness
    1. outside - 5 senses
    2. inside - physical sensations
    3. fantasy - thoughts - past memory - future concerns
    - focus on awareness like a searchlight - attention shift.

2. Exercise: Now I am aware of...
Make statement to someone.
Go around again focusing awareness on another zone & share.
Notice the area that you chose not to focus on.

3. Exercise: In two minutes I'm going to ask someone to sit in the centre of the room and talk about themselves for 15 min.
You have two minutes before I call on someone.
Debrief — Rehearsal, energy use in fantasy - tie into exams; what are you feeling, where is the focus of your awareness.

4. Exercise: Voice Listening and Voice Identification.

5. Exercise: Mirroring 1st 3.

SESSION IV

Goals: 1. To provide further opportunity for group members to learn by doing (experiential learning):

a) awareness of self through fantasy and diadic exchanges, and

b) awareness of ownership and responsibility.

Exercises: 1. -Fantasy Exercise: Animal Projection
-Share in pairs
-Process

20 - 30 min.

2. Statements:

a) I have to - I choose to
b) I can't - I won't
c) I need - I want
d) I'm afraid to - I'd like to.

Share in pairs, changing pairs with each statement.

Closing blurb and Process

60 min.

SESSION V

Goals: 1. To enable members to become aware of and be able to identify feelings.
2. To enable members to articulate feelings.
3. To encourage acceptance and ownership of feelings.
4. To help members become aware of their degree of inclusion in the group.

Materials: Cards for Emotion Card Game

Exercises:

1. Emotion Card Game
   - Introduce - range of feelings every day
     - sometimes believe we're the only ones who feel this way.
     - no such thing as right or wrong feelings, what I feel is what I feel.
     - easy to deny feelings, as
       "I shouldn't feel this way."
       "How are you? Fine!"
   - Pick a card and act out the feeling. Try to really feel the feeling on the card.
   - Debrief.

2. Inclusion Exercise
   - If this stool symbolizes being completely in the group, feeling part of it, where are you in relation to it. Place yourselves. Sit in your place, look around, how do you feel? - about your place - about others.
   - Where would you like to be in relation to the stool by the end of the group?

SESSION VI

Goals: To focus on awareness of feelings, ownership of feelings and self-disclosure.
To facilitate self-disclosure and feedback in the group

Exercises:

1. Discuss/share comments re "feeling" handout

2. Presentation of model (Johari window) by means of which each individual can look at himself in relation to himself and others, in terms of self-disclosure and feedback.

3. How do you usually see yourself?
Draw your own window and share it with the group.
Encourage self-disclosure and feedback.
Process

SESSION VII

Goals: To facilitate awareness and learning about one's identity and self-concept.

Exercises: 1) Role-Stripping Exercise (45 min.)

Have participants write down 10 "I am..." statements, on separate slips, in terms of roles or self-concept, eg."I am a son;"I am a student," I am a male," etc.

After participants have listed their statements, say "I am now going to ask you to give up one of your statements (roles)." Go around and collect one role from everyone.

Repeat the same procedure of the giving up of roles 8 more times until everyone is left with 1 role statement.

As they are surrendering their roles, have them keep track (on a separate piece of paper) of the rank order of what they gave up from 1st to last.

Process:

- What was that like to do?
- What are the one statements that people kept?
- What learnings in terms of priorities or roles were most important? Least important?
- What did it feel like to give up parts of self? (Ownership)
- What was it like to come up with 10 role statements?
- Satisfied with choices? Would that list be any different if repeated?
- What other feelings, learnings, awarenesses etc. came out?

Rosebush Fantasy Exercise (45 min.)

- Have participants relax as much as possible.
- Read the Rosebush fantasy.
- Participants share fantasy to group.

Process:

- What was the experience like?
- Feelings?
- Relatedness to "Who I am" and "What my existance is like now"
- Links to learnings of role-stripping re "identity."

SESSION VIII

Goals:

1) To enable the student to begin forming links between the individual sessions and the total 8-week experience.

2) To facilitate the identification and articulation of an awareness concerning themselves.

3) To encourage ownership of choices in and control of each student's present and future.

Exercises:

1) Each student identifies the 1 "way to live" that he has chosen which is closest to his future dreams as far as ideals are concerned; and reads his "way to live" to the rest of the group.

2) Each student identifies 2 or 3 ideals within the philosophy which appeal to him.

3) The facilitator and group concretize the abstracts into several workable goals that are clear and attainable.

4) The facilitator and the group brainstorm and share suggestions as to how to begin working towards the "way of life" they have chosen.

SESSION IX

Goals: Feedback
Closure

Exercises:

1) Collect feedback sheets

2) Wise old man

APPENDIX I

Letters

JOHN ABBOTT COLLEGE

COLLEGE 457-6610
REGISTRAR 457-5312

P.O. BOX 2000
STE. ANNE DE BELLEVUE, QUÉBEC
H9X 3L9

Sept. 30, 1977

Dear

Welcome to John Abbott College. I apologise for the form letter, but it is the only economical way of contacting so many students.

The scores from the testing session you had at registration are shown below, expressed in centiles. The number shown in each case represents the percentage of college freshmen who score lower than you did.

Reading Skills _____

Study Habits DA _____

Study Habits WM _____

☐ Your scores are will above average.

☐ Your scores are about average. You probably could make use of the "do-it-yourself" programs in reading and study skills offered by Student Services.

☐ Your scores are below average. I strongly recommend that you apply for the Program for Academic Improvement by filling out the attached application form and returning it to me in Laird 204.

If you require more information please call me at 457-6610, ext. 253.

Alex Stirling

Application Form

Program for Academic Improvement.

I wish to lapply for acceptance into the Program for Academic Improvement. I understande that I will register in an English course in which I will receive reading and stydy skill training, and a Psychology course in which I will receive training in self-modification of study behavior.

Name (please print)_____ Student no._____

Address_____ telephone _____

_____

Signed _____

JOHN ABBOTT COLLEGE

COLLEGE 457-6610
REGISTRAR 457-5312

P.O. BOX 2000
STE. ANNE DE BELLEVUE, QUÉBEC
H9X 3L9

Dear

You have been accepted into the program for Academic Improvement. You will be contacted by telephone to advise you where and when a meeting will be held to provide you with all the information you will need to register in January at regular course registration.

Alex Stirling

JOHN ABBOTT COLLEGE

COLLEGE 457-6610
REGISTRAR 457-5312

P.O. BOX 2000
STE. ANNE DE BELLEVUE, QUÉBEC
H9X 3L9

Dear

I regret that due to lack of space, I cannot offer you a place in the Program for Academic Improvement. I am prepared to guarantee you a place in the next running of the program; however it will be necessary to retest you in May. I will contact you by telephone in April with the details.

Alex Stirling

JOHN ABBOTT COLLEGE

COLLEGE 457-6610
REGISTRAR 457-5312

P.O. BOX 2000
STE. ANNE DE BELLEVUE, QUÉBEC
H9X 3L9

Dear

As you are no doubt aware by now, very few students at JAC read or study as well as they could. I believe that most of these students could improve their marks and get to feeling better about themselves as competent students if they were to learn to read and study better. The program in which you are now enrolled will teach you to read and study better and will help you to increase the amount of time you devote to studying, but it doesn't devote as much time to some areas of academic behavior as I would like, consequently I have placed you in a group that will explore in greater depth some of the top topics touched on in class, such as how to learn more easily, listening and note-taking skills, planning and scheduling workload, the SQ4R approach to studying, and exam writing techniques.

There will be ___ people in your group, and you will meet in room __ on _____ from ____ to _____.

If you have any questions, pleas contact me in L204 or in class, or bring them to the attention of your group leader during the first session

Alex Stirling

JOHN ABBOTT COLLEGE

COLLEGE 457-6610
REGISTRAR 457-5312

P.O. BOX 2000
STE. ANNE DE BELLEVUE, QUÉBEC
H9X 3L9

Dear

A good deal of research in psychology suggests that almost everyone in the 16 to 20 age group enters a period of time inwhich they wrestle with what Erikson calls the "identity crisis." Erikson suggests that during this period each individual must find satisfactory answers to questions such as "Who am I?", "What am I good at?", "What should I do about my future career?", "What should I do about my future social and family life?" and so on.

I believe that many students do less well insschool than they could because they use up much of their energy pondering on the above (and other) questions, or perhaps because they are reluctant to channel a great deal of energy into school work that doesn't seem to relate to their future.

We have found that programs which focus on developing self-awareness are helpful in enabling individuals to answer their won set of questions. Consequently, I have place you in such a group. While I can't guarantee that you will find your answers, nor can I guarantee that your marks will improve, I am confident that the experience will be a useful one. The leader of your group is _____ , a professional counselor on staff here at JAC, and has considerable experience in leading this type of group.

There will be ___ students in your group, and you will meet _____ from ____ to _____ in room _____ starting _____.

The meetings will include (a) training exercises designed to sharpen up your awareness of yourself (b) exercises designed to help you focus in on the image you have of yourself (c) interpersonal communications exercises of a skill building nature, (d) considerable discussion of the events taking place withing the group, and (e) any other activities the group may decide could be useful.

2.

Please note that the sharing of information of a personal nature is not required, nor particularly desired. If, however, an individual, in order to deal with material relating to the group, feels that background information of this type is necessary, such sharing is permitted. Nevertheless, the emphasis of the group activities is on the members of the group and their response to the happenings within the group during group sessions.

If you have any questions, please contact me in L204, or bring them to the attention of your group leader in the first session.

Alex Stirling