A COMPARISON OF A UNIDIMENSIONAL AND A MULTIDIMENSIONAL MEASURE OF LOCUS OF CONTROL IN A PSYCHOTHERAPY SETTING

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ABSTRACT

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A quasi-experimental design was employed to compare the utility of two measures of locus of control in a psychotherapy setting. The most salient difference between Rotter's (1966) and Coan's (1973) measures is the degree of their dimensionality; the former differentiates between people as generally either internal or external, the latter does so in seven psychological situations. Multiple regression analysis was used to compare the measures of locus of control in their ability to account for variance in eight standard psychotherapy outcome measures. In a comparison of pre-therapy scores, the Coan measure, taken as a whole, was a better predictor than the Rotter, and one of the Coan subscales was significantly better than the Rotter. In a comparison of therapy change scores, the same Coan subscale was again superior to the Rotter. One of the factors derived by Mirels (1970) from the Rotter measure was also compared in the same setting with the Rotter measure. The Rotter was found to be a slightly better predictor than the Mirels factor. Since the psychotherapy patients were alcoholic, an attempt was made to replicate findings that

alcoholics are more internal than Rotter's original normative sample. Those results were not replicated. Finally, a cross-lagged panel correlation was employed to determine whether expectancy for external control "causes" anxiety and other forms of reported distress or malfunction. Only one significant relationship was found, and it was in the opposite of the hypothesized direction. Suggestions for further investigation of causal relationships are made.

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INTRODUCTION

This study developed in response to the emphasis placed on the idea of personal responsibility found in much of the literature on psychosocial problems and psychotherapy. Whole theoretical schools such as Gestalt (Perls, 1969; Naranjo, 1970) as well as many individual theorists (Horney, 1950; Haley, 1963; Kaiser, 1965; Szasz, 1965) contend that an individual's realization of his freedom and personal responsibility is an important aspect of "mental health" and consequently a primary goal of psychotherapy. The fact that much has been written on the subject makes for overlap and the absence of a single, clear conceptual definition; and therefore the idea has not been adequately operationalized.

The use of the term responsibility is unfortunate. It conveys essential aspects of the meaning of the idea, but also conveys additional, unnecessary meaning which creates confusion. People often associate responsibility with a sense of obligation to others or to some ideal. But obligation is not an aspect of the idea of personal responsibility; more exactly, it is an aspect of the idea of social responsibility. And there is a growing

body of theory and research on this latter subject itself (Schwartz, 1968, 1974; Aronfreed, 1970; Piliavin et al., 1969, etc.)

Rather, personal responsibility refers simply to an individual's accountability for his decisions. He alone makes the decisions governing his own behavior; he cannot blame other people, institutions, or ideas for what he himself does. Personal responsibility is contingent upon freedom; an individual cannot be held accountable for his behavior unless that behavior is really free. The more one increases his freedom, the more he increases his personal responsibility, and vice versa. In his book, The Ethics of Psychotherapy, in which Szasz presents his theory and method of autonomous psychotherapy, he opens with the following quotation from Albert Camus, ". . . the aim of a life can only be to increase the sum of freedom and responsibility to be found in every man and in the world. It cannot, under any circumstances, be to reduce or suppress that freedom, even temporarily." Szasz, of course, presents this ideal as a goal of psychotherapy as well as of life. This same idea is expressed in other words by Karen Horney in Neurosis and Human Growth, "This (neurotic pride) then makes it close to impossible to assume the only responsibility that matters. This is, at bottom no more but also no less than plain, simple honesty about himself and his life.

It operates in three ways: a square recognition of his being as he is, without minimizing or exaggerating; a willingness to bear the consequences of his actions, decisions, etc., without trying to 'get by' or to put the blame on others; the realization that it is up to him to do something about his difficulties without insisting that others, or fate, or time will solve them for him." Kopp (1972) conveys the same idea with the pithy proverb, "It is important to run out of scapegoats."

M. Brewster Smith (1972) describes a related idea which could be labelled self-determination or self-direction. It is the personal realization that one has some significant power over the course of one's life, that one is not completely a victim of conditioning, genetics, social forces, etc. He cites the book Manchild in the Promised Land, an autobiography by Claude Brown, to help explain his idea. In the book, Brown describes his immersion in the brutal, dehumanizing conditions of the Harlem ghetto. Most of the inhabitants are caught in a vicious circle of grinding poverty, a cynical and pessimistic outlook, and a lack of initiative which maintains the poverty. Some, like the young Brown, attempt to escape the poverty through violence; but in this instance, unusual intervening circumstances in the form of respect and trust from two adults "whom he could idealize" enable Brown to realize that there were other life options. He became aware of a margin of freedom. He could not change himself

through mere "willpower" while remaining embedded in the social conditioning in which he had been raised, but he could and did choose to leave his environment. No longer locked into a vicious circle, first slowly and then with increased strength he achieved a sense of command over his own life. For Smith, who is avowedly reluctant to become ensnarled in the problem of values in relation to "mental health," this realization of one's capacity for self-direction is a very important aspect of effective psychosocial functioning.

Smith's theme is based on an earlier one described by White (1959, 1973) and labelled as competence. According to White, individuals naturally enjoy "the feeling of efficacy," the sense that they are "sufficient or adequate to meet the demands of a situation." For this inherent satisfaction in influencing the environmental obstacles, humans tend to learn as much as possible about themselves and their environment so as to be able to better meet their own needs.

From these theoretical ideas approximating the concept of personal responsibility, two critical terms stand out: self and control. The extent of an individual's personal responsibility depends on the extent of choices available to him. And the ability to choose is of course limited by the extent of one's control over oneself and the

environment. Some consideration will be given to the two critical terms.

The use of the concept of self as a source of control and choice invites many difficulties. As Wylie (1974) demonstrates, the self is extremely difficult to define, so much so that it is not surprising that whole theoretical schools such as the behaviorists prefer to eliminate the concept altogether. Nevertheless, it is equally difficult to imagine a fully developed theory of human behavior without it. The main difficulty for this consideration consists in drawing the distinction between self and other-than-self as sources of control. Of course it is evident that in many instances this distinction presents no problems; tomorrow's weather, the selection of the next king or queen of England, and the color of my eyes are events over which I clearly have no control. Whereas, whether I come to the office for work tomorrow, make reservations for a flight to San Francisco, or sign up for lessons in karate are examples from an infinite class of alternatives clearly within my power to choose. But do I control my feelings? Can I make another person feel guilty? Do I have any control over this country's political and social institutions? An accurate assessment of the extent of one's personal responsibility depends on answers to questions like these. If I have choices in relation to them, I am responsible

for these choices. On the other hand, if for example, I have no control over my feelings or the U.S. Government's military decisions, than I can hardly be held responsible for them.

There is a little inspirational prayer used by Alcoholics Anonymous groups that says, "God, grant me the serenity to accept the things I cannot change, the courage to change the things I can, and the wisdom to know the difference." It is the "wisdom" which is critical. Not to have it means wasted effort on the one hand, or premature resignation on the other, each with more or less negative consequences for an individual's future adaptation.

The distinction is really an important one. There is a strong new trend in the area of psychotherapy called cognitive-learning theory (Mahoney, 1977). It is based at least partly on the work of Albert Ellis (1962). One of Ellis's central tenets, borrowed directly from the philosopher Epictetus, is that every individual potentially has cognitive control over many of his emotions. Emotions are not the results of external events, but rather of what we tell ourselves about those events; and what we tell ourselves, our thoughts, are under our control. Therefore, we are responsible for our feelings. But are individuals really in that much control of how they feel? Can they eliminate "bad" feelings and only cultivate "good"

ones just by rearranging their beliefs and attitudes? By what series of experiments can such questions be answered? Or is it impossible to decide on scientific grounds? The validity of the cognitive-learning trend depends on some proof of this central tenet. Its usefulness as an approach to psychotherapy depends on whether one's emotions are under the control of the self or forces other-than-self.

In some areas, even the demarcation between self and other-than-self is ambiguous. In an explication of the inner- and other-direction metaphor, Collins et al. (1973) borrow from Reisman's et al. The Lonely Crowd, "For the inner-direction type, the source of direction for the individual is 'inner' in the sense that it is implanted early in life by the elders . . ." The term inner is given additional quotation marks because it refers to standards or values which might be more accurately described as internalized. They are not freely chosen by the individual, but rather are inherited and although internalized, they can be experienced by the individual just as though they were external forces. Horney (1950) speaks often of "the tyranny of the should" and Rubin (1976) of "inner dictates." Everyday examples are the individual bothered by a guilty conscience or the one who feels compelled to succeed.

A consideration of self vs. other-than-self as sources of control necessarily involves a look at the objects of their control. Most theorists emphasizing the concept of personal responsibility (Horney, 1950; Ellis, 1962; Dyer, 1976) refer primarily to an individual's control over his own voluntary behavior. This introduces distinctions equally as difficult as those surrounding the definition of self. What constitutes voluntary behavior? This is a hotly debated subject in the area of overlap between jurisprudence and social science. Again the stance of behaviorism is tempting; it is more expedient to dismiss freedom as an illusion and adopt an assumption of determinism. Such an assumption would declare the concept of personal responsibility to be meaningless and therefore this study to be absurd. Obviously, it won't be adopted. But apart from such a black or white resolution, how much of an individual's own behavior is voluntary? Social consensus still gives people a broad margin. For example, most people would agree that a given individual in a room with several people has at least several options. He may remain in the room or leave; he may talk with some of the people or remain silent (or even talk to himself); he may station himself close to some of the people or stand at a distance. A little use of imagination would reveal many alternatives.

Nevertheless some individuals behave as if they were not aware of such basic options. They wear a forced smile; they feel constrained to talk or to remain in the room. People labelled neurotic are especially apt to report a lack of personal control over many behaviors which most people would consider voluntary. One reports that he cannot leave the house without unplugging all the appliances, another that she has to spend time with an unwanted out-of-town visitor. But even in everyday life, such disavowal of freedom is common. "I can't get together tonight because my wife will be upset," or, "I have to study for an exam." It is interesting to note that people undergoing psychotherapy often report an increased awareness of simple, everyday options, as though it were a revelation. Suddenly, they no longer have to spend time with the "friend" who is always criticizing them, or they can take some time out of the day to do things that they enjoy doing, or they can make mistakes without automatically engaging in self-recrimination. Attention to self-control over voluntary behavior might seem like belaboring the obvious, but clinical evidence suggests that it is a rich area for investigation.

In what other areas does the self have control? Aside from physical force, an individual has no direct control over the objects and other people in his environment.

But there are many forms of indirect control: knowledge of patterns among events, access to others' reinforcements, access to social institutions such as the courts, etc. Reading, formal education, observation are means of amassing information and knowledge of patterns among events. Social skills, especially the art of persuasion, sheer physical effort, the amassing of money, are yet other means of achieving indirect control over the environment. Whereas direct control over one's voluntary behavior involves the realization that one can choose, as well as the ability to conceptualize options, indirect control over environmental events often requires the development of skills. People of course differ in their aptitudes for various skills, but the critical variable for this consideration is the individual's belief in the efficacy of bothering to develop a particular skill. In the same way that people differ in their awareness of how many options they have in directing their own behavior, they also differ in their motivation to attempt to exert indirect control over their physical and social environment. For some the world is too unjust, other people or institutions are too powerful, or life is simply too unpredictable; it doesn't seem worthwhile for them to try to direct things.

People also differ in their attempts to gain control or in the amount of control that they experience in specific areas of life. Some may feel confident in their ability

to persuade others while at the same time feeling unable to control themselves, for example the successful salesman who has tried for years to quit smoking. Some individuals are confident in their ability to master academic subjects like mathematics, while others might trust more in their ability to master a mechanical skill or a sport. An individual might feel very apprehensive at the thought of speaking before a group of people, but quite at ease when meeting someone of the opposite sex.

A discussion of self as a locus of control and some of the possible areas of direct or indirect control elucidates but does not resolve the above-mentioned difficulties in developing a conceptual definition of personal responsibility. An adequate definition of self must be developed, including a clear distinction between self and other-than-self. Then an elaboration of all potential areas for control with means for assessing an individual's experience of control in each one would contribute toward drawing the critical distinction between the events an individual can change and those he cannot change.

Lefcourt (1973) proposes a resolution of the issue of voluntary behavior and the distinction between real and perceived control.

He accepts that freedom and control are illusions; but he contends that an individual's beliefs about freedom and control are important variables. He sidesteps a philosophical debate and concentrates on an empirical question. It does not matter if an individual is really free or really has control; it only matters whether he believes he does. He contends that people who believe in the "illusions of freedom and control" seem to be "better adjusted." Somehow it feels awkward to be in the business of encouraging illusions, but in the absence of resolution of these perennial problems, Lefcourt's is the most practical approach.

In concluding this first section on personal responsibility, it might be helpful to sketch opposing attitudes toward the subject. An extreme belief in personal responsibility would entail an attitude of complete control over one's own behavior and an attempt to maximize one's indirect control over environmental events. Such an individual would not give causal attribution for his own behavior to any person, institution, natural force, etc., and he would maximize his freedom by developing his knowledge, skills, capacities, etc. In contrast, the denial of personal responsibility entails blaming people, events, or other external forces for what one does or fails to do. It also implies a stance of powerlessness in the face of luck, powerful other people, or an unpredictable world.

Such an individual experiences little control or freedom and believes that he cannot be held responsible for the course of his life.

Concept of Personal Responsibility and Social Learning Theory

The lack of a unified and precise conceptual definition of personal responsibility means of course that there are no adequate operational definitions. Although Genther (1976) reports on "an empirical investigation of the personal responsibility rating system", this system is not easily available to researchers, nor has it been adequately supported by research. To find an operational definition, one must look to concepts that are related to the idea of personal responsibility. The most outstanding of these related concepts was developed by Rotter et al. (1958, 1966) and called the generalized expectancy for internal vs. external control (I-E).

According to Rotter (1975), it is important to understand I-E, sometimes called locus of control, within the context of social learning theory. In Rotter's own words, "Social learning theory is a molar theory of personality that attempts to integrate two diverse but significant trends in American psychology--the stimulus-response, or reinforcement theories on the one hand and the cognitive, or field theories on the other. It is a theory that attempts to deal with the complexity of human behavior without yielding the goal of utilizing operationally definable constructs and empirically testable hypotheses.

There are four classes of variables in social learning theory: behaviors, expectancies, reinforcements, and psychological situations. In its most basic form, the general formula for behavior is that the potential for a behavior to occur in any psychological situation is a function of the expectancy that the behavior will lead to a particular reinforcement in that situation and the values of that reinforcement."

Belief in internal vs. external control is an expectancy about who or what controls the available reinforcements. An "internal" individual believes that whether he is rewarded or punished is to some significant extent up to him. An "external" individual believes that whether he is rewarded or punished "is the result of luck, chance, fate, the control of powerful others; or it is unpredictable because of the great complexity of forces surrounding him" (Phares, 1976). This expectancy for inner or outer control may be conceived of as <u>generalized</u> across situations or <u>specific</u> to particular situations. But Rotter and others stress the fact that this expectancy, whether it is conceived of as generalized or specific, is only part of the picture. When a social scientist wishes to predict human behavior, he must take into account the influence of potential reinforcements and the psychological situation in addition to the expectancies of the individual or group. In other words, we cannot realistically demand

that any measure of expectancy will account for all or even most of the variance in any given experimental design.

What are the main differences between Rotter's locus of control construct and the concept of personal responsibility? First, they differ in their origins. The I-E construct was developed out of social learning theory which focuses on reinforcements, expectancies, and situations. On the other hand, "personal responsibility" is a general term summarizing some of the ideas of a number of psychotherapist-theoreticians based on their clinical experience. The former is to be used to predict human behavior. It is an element in an experimental design. Somewhat in contrast, personal responsibility is proposed as a set of attitudes which can lead to more effective living. This of course means that the locus of control construct is the more easily operationalized. It is designed to take into account the effects of the value of different reinforcements and the effects of psychological situations. In order to be utilized in research, the concept of personal responsibility must be elaborated to cover these variable conditions. Secondly, although there is much overlap in their content areas, there are also some differences. The I-E construct may be viewed in terms of an ideology of control. It investigates an individual's expectancies about his own personal control, as well as his beliefs about how much control people in

general have. The concept of personal responsibility concentrates on an individual's awareness of options; it is primarily a set of attitudes about the self.

It is likely that a refined conceptual definition will be based on a synthesis of concepts like I-E and personal responsibility, as well as other concepts like personal causation (de Charms, 1968).* However, there is a weakness common to all of these concepts which merits consideration. The weakness is their lack of specificity. In the areas of psychotherapy (Kiesler, 1966, 1971) and personality (Mischel, 1968, 1973) research there is a strong movement away from certain traditional nomothetic assumptions. According to Kiesler, theorists and researchers have assumed that people seeking psychotherapy suffer from the same basic problems, and that of course their treatment and "cure" will be basically uniform. But instead, results of research suggest that patients

*A description of de Charm's concept is included as a complement to the conceptual definitions of personal responsibility and belief in internal vs. external control presented so far: "When a person initiates intentional behavior he experiences himself as having originated the intention and the behavior. He is the locus of causality of the behavior and he is said to be intrinsically motivated. Since he himself is the originator, we refer to the person as an Origin . . . When something external to the person impels him to behavior, he experiences himself as the instrument of the outside source, and the outside source is the locus of causality. He is said to be extrinsically motivated. Since the person is impelled from without, we refer to him as Pawn" (de Charms, 1972).

are more different than alike in the problems they have, that these problems require heterogeneous treatments, and that outcomes will vary according to the individual. In his words, "constructive personality change for various types of patients may represent change in different directions on the same variables--or different degrees of these various changes." In the same vein, Mischel has launched an effective attack against psychodynamic theories, especially their use of the concept of personality traits, or what he calls global dispositions. He marshals an impressive array of evidence questioning the intuitively certain notion that people behave consistently across situations; and he specifically attacks Rotter's use of generalized expectancies. Mischel contends that these are really no different than personality traits, and "they are likely to become just as useless." He further states, "As previously noted, since most social behaviors lead to positive consequences in some situations but not in other contexts, highly discriminative specific expectancies tend to be developed and the relatively low correlations typically found among a person's response patterns across situations become understandable. Expectancies also will not become generalized across response modes when the consequences for similar content expressed in different response modes are sharply different, as they are in most life circumstances (Mischel, 1968). Hence, expectancies tend to become relatively specific, rather

than broadly generalized.

Although a person's expectancies (and hence performances) tend to be highly discriminative, there certainly is some generalization of expectancies, but their patterning in the individual tends to be idiosyncratically organized to the extent that the individual's history is unique."

This is a critical point. Phares (1976) briefly describes the early work of Rotter and his associates on the I-E concept. "Very early, they decided to construct a scale that would capitalize on the functional relationships among various goals, or reinforcements. That is, it was recognized that for any given individual, behaviors based upon locus of control beliefs would be more highly related within a given need area than across different needs. An individual may well behave in a predominantly internal fashion when dealing with academic goals but be significantly more external in his behavior when love and affection goals are involved. The utility of devising relatively independent need categories had been demonstrated earlier by Liverant (1958) in his work on the measurement of recognition and love and affection. As applied to I-E, this simply means that predictions ought to be enhanced when we measure perceived locus of control separately in different life areas. Such a strategy should be superior to that of using a single I-E score

that must perforce be used in many different predictive situations."

Nevertheless, Rotter and his associates did not ultimately pursue this course. They opted instead for a unidimensional concept, making a broad single distinction between beliefs in internal or external control. Their reasons for this were primarily based on research with early measures of the concept which will be discussed later. Their decision set an important precedent, steering research on the I-E concept in a direction opposite to that advocated by Kiesler, Mischel, and earlier by Allport (1962).

The concept of personal responsibility is even less concerned with specificity. Like most concepts derived from clinical experience, it is based on prevailing psychodynamic assumptions especially the notion of consistent behaviors across situations. Furthermore, unlike the I-E concept, it does not even pay lip service to the importance of situations and the value of reinforcements. Advocates assume that the concept can be learned by the individual as a set of attitudes and applied generally to improve his effectiveness in living.

The main thrust of this study is an evaluation of the importance of specificity in the conceptualization and operationalization of locus of control, or personal

responsibility. It is in line with a growing body of theory and research questioning the over-reliance on certain nomothetic assumptions characteristic of psychodynamically oriented personality theory.

The first scale based on the I-E concept was developed by Phares (1955), using, "13 skill items and 13 chance items presented in a Likert scale format." A choice of skill items was defined as reflecting belief in internal control while chance items reflected belief in external control. In other early works, Liverant, Rotter and Seeman (1962), convinced that locus of control beliefs would vary according to type of reinforcement, constructed an I-E scale that contained items from several areas such as academic achievement, affection, social-political events, etc. They constructed a 100 item forced-choice questionnaire, then narrowed this to 60 items by item and factor analyses. According to Phares (1976), "Several things conspired to weaken the utility of this 60 item scale. An item analysis revealed that the subscales were not generating independent predictions. Achievement items correlated highly with social desirability measures and correlations between some of the subscales were about as high as the internal consistency of individual subscales. As a result, efforts to pursue the subscale approach were abandoned." This was a critical turning point in the operationalization of the concept. It is interesting to

note that Rotter et al. at first chose to take situation-specific expectancies into account. He commented in retrospect (Rotter, 1975) that the extra work involved in developing and validating subscales just did not seem worthwhile. Nevertheless, a steady stream of theorists and researchers have criticized the direction that Rotter took at this point. In place of a unidimensional concept emphasizing a generalized expectancy, they have suggested the implementation of a multidimensional concept finding expression in many situation-specific expectancies. As will be seen, Rotter's concept and operationalization has enjoyed impressive support. Therefore, those who advocate changes must bear the burden of proof by showing support for their suggestions. This is especially true since Rotter et al. report that they have already tried some of these suggestions and found them wanting.

Eventually, Rotter and his associates further refined the 60 item scale to 23 items, eliminating those items that correlated highly with the Marlowe-Crowne Social Desirability Scale. They also conducted two studies to begin the support of construct validity (Seeman and Evans, 1962; Rotter, Liverant, and Crowne, 1961).

The Rotter I-E scale has enjoyed unusual success as a research instrument. One of the most important variables

consistently found to relate to I-E is attempt at mastery of the environment. As logic suggests, internals tend to acquire and retain more information, and then utilize it better than do externals (Seeman, 1967; Davis and Phares, 1967; Ude and Vogler, 1969; Wolk and Ducette, 1974, etc.). Better utilization of information in turn leads to greater personal effectiveness. Phares (1965) found that internals are able to exert more influence on others than are externals; this led to the interesting finding that internals are more apt to generate the experimenter effects of eliciting the expected data from subjects (Rosenthal, 1966; Felton, 1971). In addition, internals show a greater degree of self-control than do externals, e.g., non-smoking or quitting smoking (Straits and Sechrest, 1963; James, Woodruff, and Werner, 1965), and use of birth control techniques (Lundy, 1972).

Internals appear to be less susceptible to social influence than do externals, and they are more independent, more reliant on their own judgment, and more resistant to subtle attempts at persuasion (Biondo and MacDonald, 1971; Strickland, 1970; Pines and Julian, 1972).

A great deal of research has been done on the relationship between I-E and academic achievement; much of this work has been done on children. Unfortunately, in this area more than in others, several scales other than

Rotter's (eg. the Intellectual Achievement Responsibility Questionnaire developed by Crandall, Katkovsky, and Crandall, 1965; Clifford and Cleary, 1972, etc.) have been used. There is a general finding of increased internality with increased age. However, as children grow into adults, this relationship becomes less significant. Internal children show greater capacity to delay gratification, and their reactions to success and failure seem more realistic than those of external children. The latter relationship holds true for adults.

A few investigators have been interested in the relationship between expectancy for control and the experience of psychosocial problems. From an overview of the research reported so far, one would expect internals to be more adaptive than externals. They tend to acquire more information about the environment and utilize it better, and so they would be expected to be more competent, etc. Most studies support this expectation. Phares (1976) lists a great number of studies showing a relationship between external expectancy and the self-report of anxiety. Again, anxiety need not be maladaptive, nor does failure to report anxiety guarantee the absence of anxiety. Nevertheless, this is an interesting relationship, and it has been confirmed repeatedly. So far there has not been an attempt to determine a causal relationship between expectancy for external control and anxiety.

Externality has also been found to correlate positively with schizophrenia (Harrow and Ferrante, 1969; Shybut, 1968) and depression (Abramowitz, 1969; Miller and Seligman, 1973). However, these results should be viewed with caution because of the imprecise definitions of these categories. Interestingly, externals do not seem to experience as much disruption of behavior after failure as do internals. Furthermore, they seem less denying of threat. One explanation is that they have more defenses against these experiences than do internals. How can the external be blamed for failure if things are really not under his control? Externals also more readily reduce the value of a goal after failure to achieve it.

There have been few attempts to investigate the possibility of changing an individual's locus of control. Several studies have involved training programs for teachers or counselors coupled with an assessment of their impact on groups of children. De Charms (1972) reported positive results in the form of teacher promotion and children's academic achievement following an extensive training program focused on his concept of origin-pawn. Reimanis and Schaefer (1970) and Nowicki and Barnes (1973) report similar results. They emphasize the positive effect of successful problem-solving experience on the development of an internal locus of control. A handful of psychotherapy

studies (Smith, 1970; Dua, 1970; Gillis and Jessor, 1970) suggest that succesful treatment tends to result in greater expectancy for internal control. Perhaps the most important point to be drawn from these studies is that an individual's locus of control can change over time, given appropriate environmental influence.

Inconsistent Findings and Theoretical Objections

This brief summary of research on the I-E concept, and especially that utilizing the Rotter measure, could be misleading. It has been intended to demonstrate the unusual success of this concept and instrument in the form of significant relationships with many classes of variables, in many kinds of situations, using different types of subject populations. But despite this success, experimental results as well as theoretical consideration suggest that there is room for improvement.

For example, early studies (Gore and Rotter, 1963; Strickland, 1965) supported the theoretically consistent hypothesis that internals would have a stronger belief in their ability to affect social and political institutions and would therefore engage in more behavior designed to alter them. But later studies (Geller and Howard, 1972; Evans and Alexander, 1970; Gootnick, 1973) found no relationship between locus of control and sociopolitical

activity.

Other contradictory results have been reported in studies of alcoholic's locus of control orientation. As mentioned, most investigators report a positive relationship between expectancy for internal control and psychosocial adjustment. Nevertheless, Goss and Morosko (1970) reported on a sample of alcoholics whose I-E scores were significantly more internal than those of Rotter's (1966) normative sample. Their unexpected results have been supported by Gonzali and Sloan (1971) and Oziel et al. (1972). Berzins and Ross (1973) reported on a sample of 800 opiate addicts whose I-E scores were significantly more internal than those of a comparison group of college students.

The characterization of internals as more psychosocially adjusted leads to other complications. Phares et al. (1968) found that externals were more likely to recall unfavorable evaluations than were internals, suggesting that internals might be more likely to use denial. On the other hand, it may mean that internals place less emphasis on the evaluation of others than do externals. Houston (1972) found that in a stressful situation, there was little difference in self-reported anxiety between the two groups but that internals showed a significantly greater physiological response than did externals.

Of course, there is difficulty in interpreting what greater physiological response means. Externals tend to be more like Byrne's (1964) sensitizers who are more likely to respond to threatening stimuli and who are more open about their fears (which may be interpreted as maladaptive behavior). At the same time, internals seem to be more evasive and even denying; and it is difficult to reconcile this disruption of cognitive processes with effective reality testing. From early on, Rotter (1966) had hypothesized a curvilinear relationship between I-E and psychosocial effectiveness with extremes in either the internal or external direction being less effective, more maladaptive. So far this hypothesis has not been supported; nevertheless, the above mentioned studies suggest the need for more careful studies, and perhaps reconceptualization in this area.

One response to these and other inconsistencies has been a questioning of the Rotter instrument, and even the theoretical formulation on which the instrument is based. Some investigators have proposed theoretical reformulations, and a few have produced new instruments.

The Issue of Multidimensionality

After correlating a number of other self-report measures with the Rotter instrument, Hersch and Scheibe (1967)

found that externals were much more diffuse in their self-descriptions than were internals. This prompted speculation that people subsumed under the heading external might have significantly different cognitive orientations. As Crandall et al. (1965) had pointed out, a student might not attribute academic success to chance, but he might still believe that it was subject to the external control of the teacher's whim. Collins (1974) elaborated on these early findings and speculation. He presented the 46 alternatives of the Rotter instrument in a Likert, agree-disagree format. He found a common theme running through the 46 alternatives, but he also found four distinguishable subscales. He found that an individual may score external because of four different kinds of beliefs; he may believe that the world is difficult, or that it is unjust, or that it is governed by luck, or that it is politically unresponsive. But holding one belief does not imply holding the others. For example, a student activist of the 1960's might score as external because he believes that the world is politically unresponsive. He might still believe that the world is just or that it is "governed" by scientific laws.

The suggestion, of course, was that grouping individuals with such different attitudes would lessen the predictive accuracy of the instrument. A breakdown of externals into subgroups might answer some of the riddles posed

above. For example, maybe externals who believe that the world is politically unresponsive still believe in the worthwhileness of self-control. Perhaps they gather and utilize information about their personal environment more than do other kinds of externals. If a sample contained an unusually large proportion of a certain kind of external, results might tend to negate conclusions based on research where numbers of different kinds of externals were more equally proportioned.

In an extensive review of the theoretical and research literature, Collins et al. (1973) distinguished four major dimensions of the internal metaphor. They list these dimensions as: (1) inner-direction, the commitment to traditional, socially desirable principles and goal-setting, (2) other-direction, conformity to social expectations and low self-esteem, (3) lack of constraints, the creative role player and self-actualizing free spirit, (4) belief that behavior is predictable or random. These investigators combined several existing scales, added new items, factor analyzed the data, and found these dimensions to be independent and relatively orthogonal. Among other things, they found that inner-direction is not the opposite of other-direction; both orientations can co-exist as attitudes in the same individual. But most importantly for this study, Collins et al. assert that the Rotter I-E scale

reflects a complex combination of all four of these dimensions. An individual scoring as a Rotter internal might have a high belief in the predictability of behavior and little sense of other-direction, or he might have a strong sense of inner-direction and low lack of constraints on behavior. Again differentiation among either internals or externals by such criteria as these might sharpen the concept and pave the way for measures with increased predictive accuracy.

Factor analytic techniques have also been applied to the Rotter measure itself. Gurin et al. (1969), using a sample of black students, found evidence for two separate factors; the first consisting of items related to personal control, i.e., the control that an individual believes he has over his own life, and the second consisting of items stated in the third person which are more like beliefs about how much control people in society generally possess. Mirels (1970) factor analyzed the Rotter I-E results of a sample of 300 college males and females, and also found two factors; the first is essentially identical to the one defined by Gurin et al., the second he labelled as a belief concerning the extent to which the individual citizen is deemed capable of exerting an impact on political institutions. Lao (1970) conducted research using a revised scale based on the idea of the two factors. She hypothesized that lower

class blacks might score as external in terms of personal mastery over their own environment for the reality-based reasons of racial discrimination, impoverished physical environment, mediocre educational facilities, etc. But these same people might have a high belief in the possibility of people generally exerting significant control over social and political institutions. Her hypothesis was confirmed, producing the unexpected results that at least some groups of externals are more socio-politically active than are some groups of internals. Gurin et al. (1969) make the important additional point that an internal locus of control might be clearly maladaptive for individuals who experience real obstacles to their achieving positive reinforcements. Such an orientation would result in destructive self-blame and guilt. Again, the suggestion is that a simple distinction between internal vs. external locus of control is insufficient and even misleading. Individuals with quite different orientations, and consequently quite different expectancies and resultant behaviors, may be erroneously grouped together.

More recent studies have tended to support the preliminary investigations into the multidimensionality of the I-E construct. Reid and Ware (1973), using multiple regression techniques, found two factors closely resembling those just mentioned. In a later study (Reid and Ware, 1974)

they isolated a third factor which they labelled self-control of one's impulses, desires, emotions. Several other researchers (Abrahamson et al., 1973; Joe and Jahn, 1973; Kleiber et al., 1973) have found factors similar to those of Mirels plus a few more. In the words of Abrahamson et al., "(the study) suggested that more dimensions of the locus of control attitudes need clarification and that Rotter's scale has too few items to cover all facets of internal/external dispositions."

Phares (1976) points out Rotter's I-E concept has been multidimensional all along. He describes Rotter's et al. earlier works in which they sought to tap belief in control in several areas of life. It may be recalled that Rotter did in fact work with several subscales briefly, but that he found insufficient evidence to support their utility. Phares understandably asks whether it is worthwhile to engage in these factor analyses if the isolated subscales have little or no predictive value. In short, he calls for construct validity studies to support the factors which have been generated.

Boor (1973) found that using Mirels's 1st factor (composed of 9 items from the Rotter I-E scale) alone did not result in a significantly better prediction of academic achievement than use of the total scores on the I-E did. But in another study, Abramowitz (1973) found that Mirels's

2nd factor was a better predictor of socio-political activism than was the complete Rotter measure.

Levenson (1974) has developed a test with three scales; (1) belief in chance, (2) belief in control by powerful others, and (3) perceived mastery over one's personal life. In effect, she has eliminated Mirels's 2nd factor (belief in social system control) and divided Rotter's external scale into two subscales. She has found support for the usefulness of these scales in several studies (Levenson, 1973, 1974).

Another test of peoples' beliefs about the extent of their control has been developed by Coan et al. (1973). In Coan's words, "The Personal Opinion Survey (POS) differs from Rotter's scale both in its theoretical foundations and in the methods underlying its development. It represents an attempt to capture more of the variation in the ways in which people experience control or the lack of it. A preliminary inventory of 130 true-false items was first constructed. This was deliberately designed to cover many more forms of experienced control than any previous inventory. Items were worded in terms of both personal experience and in terms of expectancies for successful control on the part of people in general. At the same time, they were designed to cover a wide range of content areas--human actions, intellectual

problems, external physical events, bodily processes, habits, moods, etc."

Three item analyses and two factor analyses on the preliminary test data have resulted in a 120 item true-false format and seven scales. The seven relatively independent factors are: (1) achievement through conscientious effort, (2) personal confidence in ability to achieve mastery, (3) capacity of mankind to control its destiny vs. supernatural power or fate, (4) successful planning and organization, (4) self-control over internal processes, (6) control over large-scale social and political events, (7) control in immediate social interaction. A few studies have been done utilizing this instrument. A study by Luce (1971) suggests that factor 2 may be useful in predicting successful intellectual performance. A sample of marijuana users was found to score lower on factors 1 and 3, and higher on factor 5 than a non-using college population sample (Pommer, 1971). Scales 3 and 6 have been found to correlate significantly with socio-economic level (Adesso, 1971).

A Test of the Utility of a Multidimensional Measure of Locus of Control

To recapitulate: Much of psychotherapy-related literature emphasized the importance of the concept of personal

responsibility. There are few, if any, measures constructed on the basis of this loosely defined concept. A related concept, Rotter's locus of control, has been operationalized and has received extensive research attention. But despite its great promise, at least some investigators criticize the concept and especially the measure for being overly simple. They complain that it is misleading to group people as either internally or externally oriented. People can report themselves as external for quite different reasons, and they can maintain different control orientations in different aspects of their lives. They point to factor analyses of the Rotter instrument itself which indicate the presence of two, even three independent factors. Additional support for their attack has come in the form of contradictory results in studies using the Rotter instrument and especially from the work of Walter Mischel. Mischel cites copious evidence supporting his contention that personality traits as generalized dispositions across situations are obsolete; they account for disappointingly little of the variance. He locates Rotter's generalized expectancy for internal vs. external control of reinforcement in the class of generalized dispositions, and hence of extremely limited utility for future research in personality and social psychology.

Rotter and his associates have presented defenses of their concept and measures. They state that all along they have been aware of the importance of situations. Although they are aware of the usefulness of specificity, they still believe that an assessment of generalized expectancies offers useful information. Furthermore, they readily admit the presence of more than one dimension in their measure, but contend that subscales based on these dimensions have so far offered little in the way of increased predictive accuracy. They applaud the creation of new scales but insist on proof of their efficacy.

The following study was designed to determine whether subscales are efficacious. Although Levenson and Coan have each reported studies showing significant relationships between their additional I-E scales and other variables, no study so far has directly compared their measures with the Rotter measure. Several studies mentioned above have performed such a comparison between Mirels's two factors and the Rotter measure, with inconclusive results. However, it should be pointed out that the Mirels factor scales are quite brief, factor 1 (belief in control of one's personal environment) consisting of 9 of the Rotter items, and factor 2 (belief in social system control) consisting of only 4 of the Rotter items. Such brevity might account for the inconclusive

results. Therefore, it was decided that a comparison between the Rotter measure and the Coan measure with its 120 items would offer a better test of the utility of multidimensional scaling of the I-E concept. However, since the Mirels factors are simply aggregates of original Rotter items requiring no additional collection of data, it was finally decided to do a three-way comparison among the Rotter, the Mirels, and the Coan measures.

The initial inspiration for the study sprang from a belief in the importance of a sense of personal responsibility, which hopefully deepens during the course of successful psychotherapy. Therefore, it was decided to do the comparison among measures of I-E in a psychotherapeutic setting. On the basis of previous studies (Butterfield, 1964; Feather, 1967; Aarons, 1969; Shybut, 1968; Williams and Nichols, 1969) it was assumed that there would be relationships between the measures of I-E and a group of standard psychotherapy outcome measures. Specifically, externality would tend to be associated with a greater degree of psychosocial disturbance, and internality with less disturbance. (As mentioned above, such a dichotomy is debatable; nevertheless, there is strong support for the division in the sense of general tendencies). Due to these relationships, the measures of I-E could be used as predictors

of the standard outcome measures, and this provides a source of comparison among the I-E measures. In short, there will be an attempt to determine which is consistently the best predictor of the outcome measures. Multiple regression analysis is well suited for such a comparison. It is capable of comparing the ability of two or more variables to predict a criterion variable. By statistically controlling for the host of intercorrelations among the predictor and criterion variables, it ascertains how much of the variance in the criterion variable is accounted for by each of the predictor variables, with the influence of the other predictor variables "removed." This may be explained in more concrete terms by considering the well established relationship between measures of locus of control and measures of anxiety. Because of the consistently high correlations between these two kinds of measures, knowledge of an individual's score on one may be used to predict his or her score on the other. But supposing that we had three measures of I-E and one self-report measure of anxiety. We might be interested in which measure of I-E would give us the best prediction of the anxiety score. Furthermore, we might be interested in whether that I-E measure told us almost as much about the anxiety score as did all three I-E measures combined, in other words, whether we could dispense with the other two I-E measures without losing too much information

about the anxiety score. More specifically the Rotter, Mirels, and Coan measures could be compared in their ability to predict anxiety scores, i.e., the amount of variance in anxiety scores accounted for by the Rotter, for example, could be determined with the influence of the Mirels and Coan measures controlled for statistically. Multiple regression analysis repeats this statistical manipulation for each of the predictor variables.

Of course there is far from unanimous consensus about which are the best existent outcome measures. In this study two types of measures were used: self-report and structured interview. The particular measures used (described below) provided a variety of criterion variables on which to compare the measures of I-E. Furthermore, the choice of a psychotherapy setting with consequent pre- and post-measures provided yet another source of comparison. Change in locus of control orientation could be used to predict change in the various outcome criterion variables.

It was decided to run a principal components analysis on the Coan scales and the eight major outcome measures. This was designed to check for redundance in the data, but more importantly to test Coan's contention that his scales are relatively independent and orthogonal.

Ideally, each of the seven scales would be separately compared with the Rotter and Mirels scales, since the Coan measure was not designed to be considered as an aggregate.

Hypotheses: First Set

Pending the results of the principal components analysis of the Coan measure, it was predicted that in both the pre-therapy situation and in the pre-post change situation, those Coan scales shown to refer to some form of belief in personal control would be the best predictors of the outcome-criterion variables. Those Coan scales are specifically (1) achievement through conscientious effort, (2) personal confidence in ability to achieve mastery, (4) successful planning and organization, (5) self-control over internal processes, and (7) control in immediate social and political events. In addition, it was predicted that the Mirels factor 1 (belief in personal control over the events in one's life) would be a better predictor of the outcome-criterion variables in both situations than the complete Rotter scores would be, but that it would be inferior to the Coan scales.

Additional Hypotheses

The psychotherapeutic setting for this study was the Alcoholics' Treatment Program of the Veterans' Hospital in Tucson, Arizona. The choice of an alcoholic population provided several advantages: (1) it is a relatively homogeneous group, (2) the treatment procedures were relatively homogeneous, (3) as mentioned above, alcoholic populations have sometimes scored on measures of locus of control in a direction opposite to what theory would lead us to predict. Kiesler (1966, 1971) and Bergin and Garfield (1971) criticize much of psychotherapy-related research because of investigators' unwarranted assumptions of the patient and treatment uniformity. Too many studies group phobics, depressives, character disorders, etc., together as if they all experience the same problems. These studies also involve a number of therapists and treatment procedures without taking into account differences among these conditions. Relative homogeneity of patients and treatments will, on the other hand, help control for a multitude of extraneous variables. This is a distinct advantage in this study although it is not designed as an assessment of psychotherapy outcomes *per se*.

Why have some groups of alcoholics scored higher in the internal direction than samples of a normal, non-alcoholic population? Several explanations have been offered.

One rationalization available to the alcoholic who continues to drink is that he could stop drinking if he really wanted to. This belief in an ultimate control over his behavior may help the individual to rationalize his drinking "just a little longer" without his facing his "addiction." This belief could be translated into an exaggerated claim of self-control which, in turn, might account for the resulting higher internal scores. At the same time, many treatment programs attempt to instill the idea of personal responsibility, suggesting to the patients that although they do need help, this will only avail them if they themselves decide to quit drinking. Persuaded to maintain this belief, alcoholics may become inclined to espouse internal control in response to the items, reflecting essentially the social pressure that has been exerted on them.

A third explanation is that alcohol itself provides an easily accessible method of controlling painful emotions. This might give the alcoholic a perverse and paradoxical sense of mastery over the trials and tribulations of life. If this were the case, however, his belief in internal control would not constitute a generalized expectancy, but rather should be limited to only a few areas of his life. Thus the alcoholic may have an unusually strong belief in internal control in a few areas (where alcohol provides an escape) while still

maintaining an external orientation in most other areas, consistent with the commonsensical theory that individuals experiencing significant problems-in-living are likely to be externally oriented. The Coan measure is ideally suited to test this explanation. Belief in internal control in one or more areas and belief in external control in others can be represented by the Coan for a given individual. In contrast, on the Rotter, this individual would have to be scored as either internal or external. It is possible that some samples of alcoholics score in the internal direction on the Rotter because they have unusually strong beliefs for internal control in a few areas which tend to give them an overall above average internal score; otherwise, they would be externally oriented in most other areas. Confirmation of this explanation would yield additional support for the utility of specific expectancies for control.

Hypotheses: Second Set

The last explanation was to be tested in two ways. The intercorrelations among Coan's seven scales for the alcoholic population were compared with the intercorrelations on the same measure of a sample of college males. It was reasoned that if alcoholics are highly internal in one or two of the seven areas of locus of control and more external than average in other areas, then their intercorrelations among scales should be closer to zero than

the intercorrelations of the college student sample. A quick method of comparing these two sets of intercorrelations is provided by principal components analysis. The more variance accounted for by the fewer number of factors, the greater the intercorrelation among the scales. Thus, it was predicted that a greater proportion of the variance in the normative (college male) sample would be accounted for by 2 or 3 factors than would be accounted for by the same number of factors for the alcoholic population.

Another hypothesis in this set was derived from an examination of the content of the Coan factors. If alcoholics perceive drinking as a means of controlling their moods and emotions, and if they believe strongly in the control it gives them, then they should score higher on Coan's scale 5 (self-control over internal processes, the control of somatic, affective, and cognitive process) than will a non-alcoholic, college student population.

Additional Hypotheses

The collection of data at two points in time provides the possibility of using correlational methods to infer causal relations. This may be accomplished by the use of the cross-lagged panel correlational technique described by Campbell and Stanley (1963). In explaining

the theoretical basis of this technique, Crano et al. (1972) state, "In every science, when a given event consistently precedes the occurrence of another, and the reverse does not hold, one of only two possibilities is entertained: (a) event 1 is presumed to be a cause of event 2, or (b) both event 1 and event 2 are the effects of some more general cause or causes. "The use of correlational data for two variables over time assesses the possibility that change in one variable may be consistently followed by change in the other, where the reverse does not hold, and this would satisfy the time-precedence notion of causality.

In the diagram below, three types of correlations involving two variables are I-E (Rotter's locus of control) and A (Taylor's Manifest Anxiety Scale). Measures of the two variables are taken at time 1 and time 2.

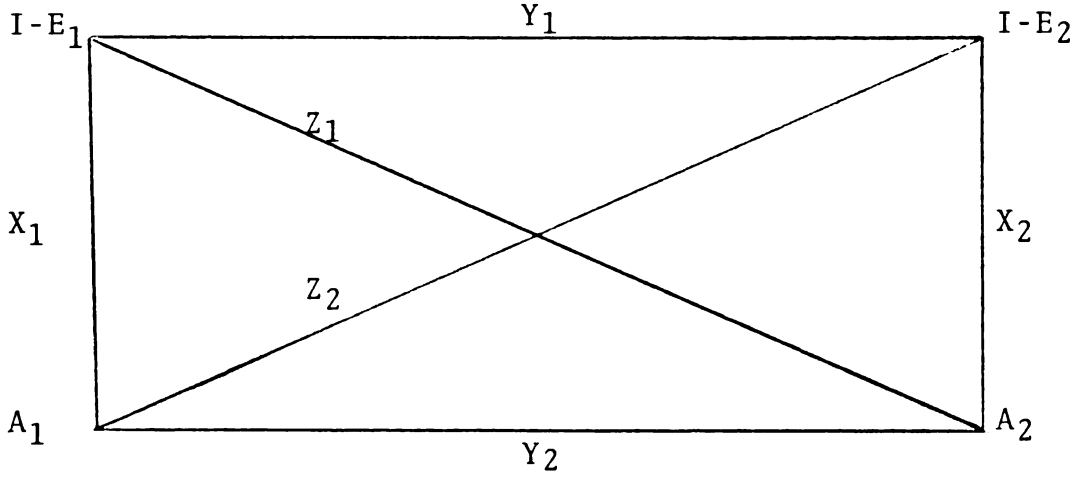

Figure 1. Cross-Lagged Panel Correlation

The correlations between I-E and A at times 1 and 2, represented by X_1 and X_2, are called synchronous correlations. Those correlations between each measure and itself over time, represented by Y_1 and Y_2, are called autocorrelations. They are generally used to assess the reliability of an instrument. Finally, there are two correlations between I-E and A which are crossed and lagged over time; they are represented in the diagram by Z_1 and Z_2. The basic idea of the crossed-lagged panel correlation (CLPC) technique is that if either Z_1, and/or Z_2 is significant and Z_1 is significantly larger than Z_2, or vice versa, then there is a suggestion of a causal relationship. This may be spelled out in a little more detail using the measures in this example. Let us suppose that Z_1 is significantly greater than Z_2 (e.g., Z_1=.64, Z_2=.03). Aside from important qualifiers which will be mentioned below, this would imply that belief in external control precedes anxiety, but that the reverse does not hold. In other words, externality at time 1 is consistently followed by reported anxiety at time 2; but anxiety at time 1 has no consistent relationship with externality at time 2. The tempting inference is that belief in external control is a cause of self-reported anxiety.

However, several caveats must be introduced. It is unlikely that correlational methods could so easily

replace experimental design as a source of inferring causal relations. First, Campbell and Stanley (1963) describe the CLPC as a quasi-experimental method. Secondly, a series of articles have made explicit the assumptions underlying the technique and have stated the need for consideration of plausible competing hypotheses. Finally, as Kenney (1975) points out, an investigator will be unlikely to find significant results using the CLPC technique with a sample size of less than 100 to 150 subjects. The much smaller number of subjects available for this study (N=34) requires that any hypotheses in this study based on the CLPC technique be considered strictly as exploratory.

Two important assumptions underlying the use of this technique should be mentioned. Kenney (1975) and Calsyn (1976) emphasize the importance of synchronicity and stationarity for ruling out third variable effects that would interfere with causal inference. Synchronicity requires that the two variables are measured at the same point in time, i.e., the synchronous correlations are between measures taken simultaneously. Although synchronicity would seem to be an easy criterion to meet, it is made difficult by what Kenney calls the problems of retrospection and aggregation. Retrospection is a problem in any study using self-report measures, since subjects have to "recall behaviors, attitudes,

or experiences of the past." Therefore, "In some sense the data may not be generated at the time of actual measurement but at some time prior to measurement." Measures of locus of control and of anxiety require the subject to retrospect, and to some extent invalidate the assumption of synchronicity. Aggregation refers to variables which are aggregated or averaged over time, e.g., students' grade point averages, and is not a problem in this study.

According to Kenney (1975), stationarity, "means that the causal or structural equation for a variable is not different at the two points of measurement." The best test for this assumption lies in a comparison of the synchronous correlations; consequently, consideration of it will be deferred to the results section.

The last point to be made about the use of this technique concerns the existence of competing interpretations of the CLPC data. Rozelle and Campbell (1969) and Sandell (1971) point out that it was initially believed that only two hypotheses were in competition: A causes B vs. B causes A. Unfortunately, this turns out to be an oversimplification. "Potentially at least four hypotheses are in competition:

Increases in A increase B, and decreases in A decrease B.

Increases in A decrease B, and decreases in A increase B.

Increases in B increase A, and decreases in B decrease A

Increases in B decrease A, and decreases in B increase A."

In terms of the example above, this would mean that if Z_1 were significantly greater than Z_2, we would have to choose between the following hypotheses:

Increases in externality increase anxiety, and decreases in externality decrease anxiety

versus

Increases in anxiety decrease externality, and decreases in anxiety increase externality.

The second pair of statements appears absurd and may in this instance be discarded. But it seems important to generally take these rival hypotheses into consideration.

It may be concluded from the above discussion that the use of the CLPC technique in this study is tentative and may only be productive of a set of exploratory hypotheses. Nevertheless, its use seems quite relevant to the subject

matter of this study. As mentioned previously by Phares (1976), "a great deal of evidence clearly supports a strong relationship between externality and a variety of measures of anxiety . . . the relationship has been found in so many different studies, with so many different anxiety measures, populations, and test conditions, that the conclusion now appears inescapable." However, he hastily adds, "Of course, one must be careful to emphasize that these studies are entirely correlational in nature. That being the case, it is difficult to separate cause from effect in any definitive way. Does anxiety lead to an external belief system or does externality lead to anxiety? Or do the same conditions (social and familial) that lead to external beliefs also lead to anxiety?" The use of the CLPC technique, meeting the requisite assumptions, and with a sufficiently large sample size, might provide answers to some of these questions.

But there is an even larger theoretical issue involved in this kind of consideration. According to many advocates of the cognitive-learning trend in psychotherapy (Mahoney, 1977; Beck, 1976; Meichenbaum, 1977), it is the individual's beliefs, values, and attitudes which play an important role in what emotions he will experience. Expectancies are of course one kind of cognitive variable. A finding suggesting a causal relationship between

expectancy for internal or external control and an emotional state such as anxiety would have important implications for the cognitive-learning theory. It would provide support for a psychotherapy which aimed at changing cognitive constructs in order to control emotions such as anxiety, depression, anger, and guilt.

Hypotheses (Exploratory): Third Set

It was predicted that externality, as measured by the Rotter, Mirels, and selected Coan scales, would tend to cause anxiety (as measured by a self-report questionnaire described in the Method section, page 49). Furthermore, it was decided to use the CLPC analysis with any outcome measures that showed significant synchronous correlations with one or more of the measures of I-E.

Method

Subjects:

The subjects for this study were drawn from the population of patients entering the Tucson VAH Alcoholics Treatment Program. Eligibility for entry into the program was decided by consensus of the A.T.P. staff. An alcoholic may be defined as a person (a) whose drinking seriously interferes with his physical and psychological health, his interpersonal relationships, or his work (Coleman, 1972), (b) who is unable to stop

drinking after two or three drinks (Fox, 1957; Jellinek, 1960), (c) who experiences withdrawal symptoms within two weeks after abstaining from his accustomed use of alcohol. The staff attempted to employ these criteria in making their decisions about eligibility.

Patients were male, between the ages of 17 and 60, with an average educational level of high school graduate. Most were at a lower-middle to middle socio-economic level (sometimes reduced well below that because of their abuse of alcohol). Most were married, or had been married.

Patients typically went through a waiting period of from 1 to 3 months before entry into the treatment program. The program lasted for eight weeks, with patients entering and leaving on a rotational basis, resulting in about 3 to 5 individuals departing per week. During fiscal 1975-76, the census of patients was kept at about 25; of those veterans beginning the program, 59% completed it. Part of this attrition rate can be attributed to the requirement that patients completely abstain from the use of alcohol during the program; any infractions were met with expulsion.

Subjects were selected from this population on a voluntary basis. Pre- and post-treatment measures were administered

to 34 subjects.* This group was racially distributed as follows: 30 Caucasian, 2 Navajo Indian, 1 Black, 1 Mexican-American. Twelve were presently married, 3 were single, 19 had been married.

Measures:

Two measures of locus of control and 4 measures of psychotherapeutic outcome were administered to the subjects once at the beginning and once at the end of their treatment. The measures of locus of control have already been described in some detail. Rotter's measure consists of 29 items including 6 dummies. It is generally scored in the external direction. However, since the Coan scales are scored in the internal direction, the Rotter scores were reversed to score in the internal direction also. The following scores would indicate maximal internality on each of the seven Coan scales: (1) =12, (2) =16, (3) =17, (4) =22, (5) =19, (6) =20, (7) =14. Mirels's factor 1 scores were derived from the Rotter data with a maximal internal score equalling 9, (cf., Appendix A for I-E test items).

The outcome measures consisted of a structured interview and three self-report scales measuring anxiety, hostility,

*Thirty subjects were lost through the normal drop-out rate. The length of the program was shortened to 5 weeks in September of 1976, after which pre-treatment data collection was terminated.

and depression. The Psychiatric Status Schedule (PSS, Spitzer et al., 1970), "was designed for the evaluation of the psychopathology and role functioning of both patients and non-patients." In addition to sections designed to detect the usual mental status type of signs and symptoms, the PSS contains sections which evaluate (1) impairment in formal role functioning, (2) impairment in the efficiency or conduct of leisure time activities or daily routine, (3) impairment in interpersonal relationships, (4) the use of drugs and alcohol, or other psychopathic activity. The PSS consists of a standardized interview schedule which is used by the interviewer to elicit information needed to judge a matching inventory of 321 precoded items. (A sample of the interview may be found in Appendix B). There is a score for total psychopathology, 4 macro-scales (Subjective Distress, Behavioral Disturbance, Impulse Control Disturbance, Reality Testing Disturbance), and summary role (including wage earner, housekeeper, student or trainee, mate, and parent roles). There are also scores for 16 micro-scales whose labels are listed in Appendix B. The PSS is being used in an increasing number of psychotherapy-related studies. It has received praise and recommendation from several important sources (Bergin and Garfield, 1971; Bergin and Strupp, 1972; Waskow and Parloff, 1975). Reliability and construct validity data are cited by Spitzer et al. (1970).

Each of the paper and pencil self-report measures has a fairly long history of use in studies on personality and psychopathology. They include the Buss-Durkee Hostility Scale (Buss and Durkee, 1957), the Self-Rating Depression Scale (Zung, 1965), and the Taylor Manifest Anxiety Scale (Taylor, 1953). Items from these scales may be found in Appendix C along with the PSS. These scales are scored in the direction of psychopathology, i.e., higher scores signify greater amounts of reported disturbance.

The ranges of the PSS scales and the self-report measures may be found in Appendices B and C.

Procedure:

Each patient entering the treatment program between February and October of 1976 was approached by the principal investigator and asked if he wished to participate in a research study on alcoholism. No remuneration was offered; the voluntariness of participation was stressed. It was especially pointed out that refusal to participate would not adversely affect the patient during the program. If the patient agreed to participate, he was asked to read and sign a subject consent form (cf., Appendix D). Within a few days, volunteers were interviewed by the principal investigator and given a packet of questionnaires (including the I-E and self-report measures) to be taken

home or to the hospital quarters, filled out, and returned within 3 days. If questions were asked by the subjects, it was explained that this study was investigating peoples' attitudes about how much control they believed they had over how well their lives went. It might be mentioned that the interview and some of the questionnaires were designed to check how depressed or worried they might be feeling. If subjects asked more probing questions, it was explained that their own test scores and the goals of the study could be given to them after their completion of the treatment program. The interview and questionnaires were administered to each of the subjects once again at the end of the eight week program.

Results

Pre- and post-scores for twenty-six variables on each of thirty-four subjects were fed into the computer. These included the Rotter, Mirels's factor 1, the seven Coan scales, the three self-report questionnaires (Taylor, Buss-Durkee, and Zung), and fourteen scales from the Psychiatric Status Schedule. These latter included: Total Psychiatric Disturbance, three macro-scales (Subjective Distress, Behavioral Disturbance, and Impulse Control), Summary Role, and nine micro-scales (e.g., Guilt, Social Isolation, Overt Anger, Alcoholism, etc.). Those PSS scales which were not computed in relation to the other variables were considered on the basis of

content to be more applicable to psychotic patient populations (e.g., the Reality Testing Disturbance macro-scale).

A frequency distribution was computed for each of the variables and was found to be sufficiently normal to meet the requirements of the statistical methods to be used.

A principal components analysis was done on the pre-scores of the seven Coan scales with the following results. (The correlation matrix may be found in Appendix E.)

Table 1. Principal Components Analysis, Coan Pre-Scores

Factor	Eigenvalue	% of Variance
1	3.03320	43.3
2	1.13861	16.3
3	.80531	11.5
4	.60931	8.7
5	.56617	8.1
6	.45730	6.5
7	.39010	5.6

A factor matrix was developed and varimax rotated with Kaiser normalization.

Table 2. Factors, Coan Pre-Scores

Coan Scale	Factor 1	Factor 2
1	.52486	-.35130
2	.73108	.26708
3	.04540	.91779
4	.77447	.07840
5	.68634	.07609
6	.74384	-.24270
7	.76109	-.22011

This analysis suggests that two factors underlie the Coan scales in this sample, the first being an amalgamation of scales 1, 2, 4, 5, 6, and 7 (accounting for 43% of the variance), and the second consisting of Coan scale 3. It may be noted again that scale 3 is labelled "Capacity of mankind to control its destiny vs. supernatural power or fate." In terms of content, this scale corresponds with the second factor of the Rotter scale reported by Gurin et al. (1969) which they described as a general control ideology, consisting mainly of items written in the third person. Although no conclusions were drawn at this point, the analysis seemed to argue against Coan's contention that his seven scales are measuring fairly independent components of experienced control, and in favor of Rotter's skepticism regarding the utility of subscales because of their high intercorrelations.

A second principal components analysis was done on the pre-scores of five scales from the PSS and the three self-report measures. Since the macro-scales of the PSS are simply sums of the micro-scales, an analysis combining both of them would be erroneous. Consequently, it was decided to focus on four macro-scales (Subjective Distress, Behavioral Disturbance, Impulse Control, and Summary Role) along with one micro-scale (Alcoholism) chosen for its special applicability to this patient population. The results are listed below (cf., Appendix E for the correlation matrix).

Table 3. Principal Components Analysis, Outcome Pre-Scores

Factor	Eigenvalue	% of Variance
1	3.12823	39.1
2	1.50009	18.8
3	1.02224	12.8
4	.77721	9.7
5	.66430	8.3
6	.37057	4.6
7	.20026	2.5

A factor matrix was developed and varimax rotated with Kaiser normalization.

Table 4. Factors, Outcome Pre-Scores

Outcome Scale	Factor 1	Factor 2	Factor 3
Subj. Dist.	.67656	.55677	.04964
Beh. Dist.	-.35318	.79535	-.13669
Imp. Cont.	.63992	-.10299	.08491
Alcoholism	.40551	-.13170	.75301
Summ. Role	.03042	-.18201	-.88255
Taylor	.59563	.48345	.47105
Buss-Durkee	.78813	.04438	.15271
Zung	.25427	.73319	.23716

Although the first three factors of this analysis account for 70% of the variance, it is difficult to divide the eight measures into three consistent groups. It may be noted that Impulse Control and the Buss-Durkee Hostility Scale load heavily on the first factor and not on the second two, and that Summary Role loads heavily only on factor three. Nevertheless, on the basis of an overall look at the results of the analysis, it was decided not to group these scales into a smaller number of factors, but rather to treat them as eight separate outcome measures.

The testing of the first hypothesis (that one or more of the Coan scales would be generally better predictors of the eight outcome measures than would the Rotter or Mirels scales) consisted in a series of multiple regression

analyses. In the first set of these analyses, four measures of I-E were treated as the independent or predictor variables. They were the Rotter, Mirels's factor 1, Coan 3, and Coan (1, 2, 4, 5, 6, 7). This last measure consisted of an average of all of the Coan scales save one, and will be referred to as Coan Avg. It may be noted that such an average across scales is contrary to the theory underlying the Coan instrument. However, such treatment seemed warranted by the results of the principal components analysis. Furthermore, later analyses were performed using the Coan scales separately. Summary data for each of the eight regression analyses comprising the first set are listed below.

Table 5. Multiple Regression, Subjective Distress

Multiple R	.33246
R^2	.11053
F	.86985
Significance	.494

Predictor	R^2 Chg.	F	Significance
Coan 3	.01802	.90946	.348
Rotter	.03384	.18714	.669
Coan Avg.	.05061	1.39849	.247
Mirels	.00805	.25340	.619

According to Table 5., the four I-E measures combined account for no more than 11% of the variance of the Subjective Distress outcome measure.

Table 6. Multiple Regression, Behavioral Disturbance

Multiple R	.33158
R^2	.10995
F	.86469
Significance	.497

Predictor	R^2 Chg.	F	Significance
Coan 3	.00057	.00621	.938
Rotter	.00908	.55538	.462
Coan Avg.	.09240	3.08590	.090
Mirels	.00789	.24825	.622

According to Table 6., the four I-E measures combined account for no more than 10% of the variance of the Behavioral Disturbance outcome measure. Although the results of this analysis do not even approach significance, it may be noted that Coan Avg. accounts for 9% of the variance in the criterion variable, with the Rotter, Mirels, and Coan 3 combined accounting for only 1% of the variance.

Table 7. Multiple Regression, Impulse Control

Multiple R	.20113
R^2	.04045
F	.29511
Significance	.879

Predictor	R^2 Chg.	F	Significance
Coan 3	.03505	1.04735	.315
Rotter	.00287	.11875	.733
Coan Avg.	.00035	.01601	.900
Mirels	.00128	.03738	.848

According to Table 7., the four predictor variables combined account for no more than 4% of the variance of the Impulse Control outcome measure.

Table 8. Multiple Regression, Alcoholism

Multiple R	.59371
R^2	.35249
F	3.81061
Significance	.014

Predictor	R^2 Chg.	F	Significance
Coan 3	.03546	2.42226	.131
Rotter	.01546	3.87070	.059
Coan Avg.	.30154	12.83306	.001
Mirels	.00003	.00110	.974

According to Table 8., the four predictor variables combined account for 35% of the variance of the Alcoholism outcome measure, a relationship significant at the .01

level. The Coan Avg. accounts for 30% of that variance, a relationship significant at the .001 level. It may be noted that although the relationship between the Rotter and the outcome measure is significant at the .05 level, the Rotter accounts for only 1% of the variance of that measure.

Table 9. Multiple Regression, Summary Role

Multiple R	.52512
R^2	.27576
F	2.66525
Significance	.053

Predictor	R^2 Chg.	F	Significance
Coan 3	.02640	.17131	.682
Rotter	.00015	.06203	.805
Coan Avg.	.20387	6.77339	.015
Mirels	.04535	1.75309	.196

According to Table 9., the four I-E measures combined account for 27% of the variance of the Summary Role outcome measure, a relationship significant at the .05 level. The Coan Avg. predictor accounts for 20% of that variance, with a relationship between Coan Avg. and Summary Role significant at the .01 level.

Table 10. Multiple Regression, Taylor

Multiple R	.66606
R^2	.44363
F	5.58166
Significance	.002

Predictor	R^2 Chg.	F	Significance
Coan 3	.00979	1.47551	.235
Rotter	.04169	.34849	.560
Coan Avg.	.38638	18.45787	.000
Mirels	.00577	.29055	.594

According to Table 10., the four I-E measures combined account for 44% of the variance of the Taylor outcome measure, a relationship significant beyond the .01 level. The Coan Avg. score accounted for 38% of that variance, indicating a relationship between the Coan Avg. and Taylor measures significant beyond the .001 level.

Table 11. Multiple Regression, Buss-Durkee

Multiple R	.51646
R^2	.26673
F	2.54634
Significance	.062

Predictor	R^2 Chg.	F	Significance
Coan 3	.08365	3.52150	.071
Rotter	.07592	.00114	.973
Coan Avg.	.10647	4.08009	.053
Mirels	.00070	.02677	.871

According to Table 11., the four I-E measures combined accounted for 26% of the variance of the Buss-Durkee outcome measure, a relationship significant just above the .05 level. The relationship between the Coan Avg. and the Buss-Durkee was significant at the .05 level, with the Coan Avg. accounting for 10% of the variance.

Table 12. Multiple Regression, Zung

Multiple R	.54474
R^2	.29674
F	2.95359
Significance	.037

Predictor	R^2 Chg.	F	Significance
Coan 3	.02508	.39719	.534
Rotter	.17773	.00316	.956
Coan Avg.	.01593	1.05549	.313
Mirels	.07799	3.10519	.089

According to Table 12., the four predictor variables combined account for 29% of the variance of the Zung outcome measure, a relationship significant beyond the .05 level. The Rotter accounts for 17% of that variance, but does not manifest a statistically significant relationship with the Zung measure.

In this first set of multiple regression analyses, there were four relationships between the predictor and criterion variables significant at or beyond the .05 level, and two

of these were significant beyond the .01 level. In three of these relationships, the Coan Avg. accounted for the greater part of the variance in the criterion variables and showed relationships with them (Alcoholism, Summary Role, and the Taylor) significant beyond the .01 level, and with two of these (Alcoholism, Taylor) beyond the .001 level. Of the four analyses which did not evidence significant relationships between the predictor and criterion variables, in three of them the Coan Avg. variable accounted for more variance in the outcome measures than did the other I-E measures, and in two of these the Coan Avg. accounted for a clear majority of the variance.

Although there were no statistically significant differences between the Rotter and the Mirels factor 1 scales in their ability to predict the criterion measures, the Rotter tended to account for slightly more variance than did the Mirels.

The first set of multiple regression analyses gave a clear indication that the averaged Coan scales 1, 2, 4, 5, 6, and 7 combined to produce a better predictor variable than the Coan 3, the Rotter, or the Mirels factor 1. Consequently, it was decided to consider this composite variable broken down into its constituent scales. A second set of multiple regression analyses was run to

determine whether any of the six scales comprising the Coan Avg. variable was a superior predictor of the eight criterion variables. Summary data for each of the eight analyses of the second set are listed below.

Table 13. Multiple Regression, Subjective Distress (2)

Multiple R	.68634
R^2	.47107
F	4.00767
Significance	.005

Predictor	R^2 Chg.	F	Significance
Coan 1	.00007	2.34845	.137
2	.00426	3.83764	.061
4	.13026	6.40739	.017
5	.31464	9.07782	.006
6	.01802	.00100	.975
7	.00381	.19444	.663

According to Table 13., the six Coan scales accounted for 47% of the variance of the Subjective Distress criterion variable, a relationship significant beyond the .01 level. (It should be noted that when these six scales were averaged and treated as one variable, they accounted for only 5% of the variance in the same variable.) Coan scale 5 accounted for 31% of the variance of the Subjective Distress measure, a relationship significant beyond the .01 level. Coan scale 4 accounted for 13% of the variance, significant at the .01 level.

Table 14. Multiple Regression, Behavioral Disturbance (2)

Multiple R	.39980
R^2	.15984
F	.85613
Significance	.539

Predictor	R^2 Chg.	F	Significance
Coan 1	.02908	.84804	.365
2	.00317	.06576	.800
4	.01123	.48040	.494
5	.06105	2.02789	.166
6	.01758	.64725	.428
7	.03773	1.21241	.281

According to Table 14., the six Coan scales accounted for a combined 15% of the variance in the Behavioral Disturbance outcome measure. Coan 5 accounted for 6% of that variance.

Table 15. Multiple Regression, Impulse Control (2)

Multiple R	.52293
R^2	.27345
F	1.69369
Significance	.161

Predictor	R^2 Chg.	F	Significance
Coan 1	.09559	5.88038	.022
2	.00277	1.94695	.174
4	.11015	4.05519	.054
5	.04827	.50721	.482
6	.01667	.00905	.925

Predictor	R^2 Chg.	F	Significance
7	.00001	.00054	.982

According to Table 15., the Coan scales accounted for a combined 27% of the variance in the Impulse Control measure. Coan 4 accounted for 11% of that variance.

Table 16. Multiple Regression, Alcoholism (2)

Multiple R	.52744
R^2	.27819
F	1.73434
Significance	.151

Predictor	R^2 Chg.	F	Significance
Coan 1	.00392	.01720	.897
2	.01085	.60789	.442
4	.01589	.30721	.584
5	.05978	1.17846	.287
6	.02181	3.03488	.093
7	.16594	6.20716	.019

According to Table 16., the six Coan scales accounted for a combined 27% of the variance in the Alcoholism measure. Coan 7 accounted for 16% of that variance.

Table 17. Multiple Regression, Summary Role (2)

Multiple R	.62096
R^2	.38560
F	2.82419
Significance	.029

Predictor	R^2 Chg.	F	Significance
Coan 1	.01991	.19310	.664
2	.01891	.44089	.512
4	.01128	.25189	.620
5	.14435	5.23943	.030
6	.06811	5.90648	.022
7	.12304	5.40703	.028

According to Table 17., the Coan scales accounted for a combined 38% of the variance in the Summary Role measure, a relationship significant beyond the .05 level. Coan 5 accounted for 14% of that variance, Coan 7 for 12%, and Coan 6 for 6%, each significant beyond the .05 level.

Table 18. Multiple Regression, Taylor (2)

Multiple R	.85079
R^2	.72384
F	11.79496
Significance	.000

Predictor	R^2 Chg.	F	Significance
Coan 1	.03113	.87097	.359
2	.07848	2.94871	.097
4	.07294	5.72125	.024

Predictor	R^2 Chg.	F	Significance
5	.43741	25.24123	.000
6	.00366	1.26872	.270
7	.10022	9.79871	.004

According to Table 18., the Coan scales accounted for a combined 72% of the variance in the Taylor measure, a relationship significant beyond the .001 level. Coan 5 accounted for 43% of that variance, significant beyond the .001 level; Coan 7 accounted for 10% of the remaining variance, significant beyond the .01 level; and Coan 4 accounted for 7% of the remaining variance, significant beyond the .05 level.

Table 19. Multiple Regression, Buss-Durkee (2)

Multiple R	.63895
R^2	.40825
F	3.10460
Significance	.019

Predictor	R^2 Chg.	F	Significance
Coan 1	.00166	1.37467	.251
2	.00000	3.51560	.072
4	.00677	.24722	.623
5	.38572	13.14864	.001
6	.00456	.00432	.948
7	.00953	.43501	.515

According to Table 19., the Coan scales accounted for a combined 40% of the variance in the Buss-Durkee measure,

a relationship significant beyond the .05 level. Coan 5 accounted for 38% of that variance, a relationship significant beyond the .001 level.

Table 20. Multiple Regression, Zung (2)

Multiple R	.65538
R^2	.42952
F	3.38813
Significance	.013

Predictor	R^2 Chg.	F	Significance
Coan 1	.01135	.43899	.513
2	.04276	.74497	.396
4	.21833	9.46473	.005
5	.11125	1.90258	.179
6	.00013	2.11285	.158
7	.04570	2.16299	.153

According to Table 20., the six Coan scales combined accounted for 42% of the variance in the Zung measure, a relationship significant at the .01 level. Scale 4 accounted for 21% of that variance, a relationship significant beyond the .01 level. It may be noted that Coan 5 accounted for 11% of the remaining variance.

To summarize the second set of multiple regression analyses, there were five relationships between the predictor and criterion variables significant beyond the .05

level, two of these beyond the .01 level, and a third beyond the .001 level. Coan 5 (Self-control over internal processes) was clearly the best predictor of the outcome measures. It showed a significant relationship with four of the eight criterion variables, and it accounted for most of the variance in two of the remaining four variables. Three of its relationships were significant beyond the .001 level. Coan 7 and 4 were the next best predictors.

It should be noted that although the Coan scales 1, 2, 4, 5, 6 and 7 did not appear especially independent in the principal components analysis, there is a clear differentiation in their respective predictive accuracy of the criterion variables. Thus, the second set of multiple regression analyses offers support of the utility of more specified subscales of the I-E concept.

Since Coan 5 showed itself to be a strong predictor variable, it was decided to run a third set of multiple regression analyses using Coan 3, Coan 5, the Rotter, and the Mirels factor 1 as predictors of the eight outcome measures. Tables for this analysis will not be listed, but the most noteworthy results will be summarized. Relationships significant beyond the .05 level were found between the combined predictors and four of the criterion variables (Summary Role, Taylor, Buss-Durkee, and the Zung). The predictors accounted for 33% of the

variance in the Summary Role measure, and Coan 5 accounted for 28% of that variance. The predictors accounted for 54% of the variance in the Taylor, and Coan 5 accounted for 49% of that variance. The predictors accounted for 51% of the variance in the Buss-Durkee measure, and Coan 5 accounted for 50% of that variance. Although the relationships between the predictors and the criteria (Alcoholism and Subjective Distress) were not significant, Coan 5 accounted for 20% out of 25% and 19% out of 24% respectively of the variance in the criteria accounted for by the predictor variables.

One conclusion may be drawn at this point. Granting the limitations on generalization from such a small sample, the Coan scales in general and Coan 5 in particular were unquestionably superior to the Rotter scale in their ability to predict eight standard psychotherapy outcome measures.

The fact that these measures were taken in a psychotherapy setting meant that it was possible to compare changes in the various measures of I-E with changes in the eight outcome measures. A second frequency distribution was computed, this time of the absolute change in each of the measures. Again the distributions of the relevant variables were sufficiently normal to support the assumptions of the two statistical methods to be used. A table

listing the mean change in each of the relevant measures is given below.

Table 21. Mean Change Scores

Measure	$\bar{X}$
Rotter	.353
Mirels	-.182
Coan 1	1.059
2	.882
3	.088
4	.324
5	1.758
6	.706
7	.147
Subjective Distress	-10.941
Behavioral Disturbance	-2.735
Impulse Control	-3.971
Summary Role	-1.971
Alcoholism	-22.500
Taylor	-2.121
Buss-Durkee	-.529
Zung	-8.176

It is important to note that most of the I-E scales do not reflect a great deal of change between the pre- and post-measures. This is especially true for the Rotter and for the Mirels (which changed slightly in the external direction). Of the I-E scales, Coan 5

reflected the greatest amount of change. It should also be noted that the dramatic change in the Alcoholism measure is misleading. Since any participant who drank alcohol while in the program was expelled, this variable could only change in the direction of less drinking. All of the outcome measures reflect a mean change toward less psychopathology. All but one of the I-E measures reflect change, however slight, toward internality.

A principal components analysis was done on the change scores of the seven Coan scales. The pertinent results are listed below. (The correlation matrix may be found in Appendix F.)

Table 22. Principal Components Analysis, Coan Change Scores

Factor	Eigenvalue	% of Variance
1	2.17327	31.0
2	1.61784	23.1
3	.98242	14.0
4	.87734	12.5
5	.67176	9.6
6	.48762	7.0
7	.18974	2.7

Comparing this analysis with the one done on the Coan pre-scores shows a more even spread of variance accounted

for by the "factors" underlying the seven scales. The varimax rotated factor matrix after rotation with Kaiser normalization is as follows:

Table 23. Factors, Coan Change Scores

Scale	Factor 1	Factor 2
Coan 1 Chg.	.23569	.58223
2 Chg.	.54221	.43761
3 Chg.	.35890	-.65870
4 Chg.	.29136	.61045
5 Chg.	-.04339	.72687
6 Chg.	.90629	-.06956
7 Chg.	.72702	.07655

As in the principal components analysis of the Coan pre-scores, Coan 3 is noticeably independent of the other scales. (It may be noted that Coan 3 registered the least change of the seven scales.) However, according to this analysis, the other six scales are more spread out; therefore, there is no basis for grouping them as one factor.

An additional principal components analysis was performed on the change scores of the eight outcome measures. The correlation matrix may be found in Appendix F. Although there was some basis for groupings, it was decided again to treat all eight outcome measures separately.

A fourth and final set of multiple regression analyses was done using the change scores of four I-E scales (Rotter, Mirels factor 1, Coan 5, and Coan 3) as predictor variables and the change scores of the eight outcome measures as criterion variables. Only those analyses with significant or near significant results are listed here.

Table 24. Multiple Regression, Taylor Change

Multiple R	.57277
R^2	.32806
F	3.17352
Significance	.030

Predictor	R^2 Chg.	F	Significance
Rotter Chg.	.00631	3.82291	.061
Mirels Chg.	.10740	4.1557	.052
Coan 5 Chg.	.17795	4.52711	.043
Coan 3 Chg.	.03640	4.52711	.091

According to Table 24., the four predictors combined accounted for 32% of the variance in Taylor Chg., a relationship significant beyond the .05 level. Coan 5 accounted for 17% of that variance, a relationship significant beyond the .05 level; and the Mirels factor 1 accounted for 10% of the remaining variance, a relationship significant at the .05 level.

Table 25. Multiple Regression, Summary Role Change

Multiple R	.52084
R^2	.27127
F	2.51270
Significance	.065

Predictor	R^2 Chg.	F	Significance
Rotter Chg.	.00662	.39531	.535
Mirels Chg.	.02628	.97373	.333
Coan 5 Chg.	.23098	8.34827	.008
Coan 3 Chg.	.00739	.06190	.805

According to Table 25., the four predictors combined accounted for 27% of the variance in Summary Role Chg., a relationship not quite significant at the .05 level. Coan 5 accounted for 23% of that variance.

In addition, the four predictors accounted for 7% of the variance in the Zung Chg. measure, and Coan 5 accounted for all 7% of that variance. None of the other relationships in this set of multiple regression analyses approached significance.

Hypotheses: Second Set

This set of hypotheses was designed to investigate the paradoxical finding in some studies that alcoholics scored higher in the internal direction than did subjects drawn from a normal (non-alcoholic) population. Coan scores from a group of 49 male college students were

compared with the scores from the alcoholic sample. A comparison of means along the seven scales is listed below.

Table 26. Mean Coan Scores

Coan Scales	Alcoholic $\bar{X}$ (N=34)	Student $\bar{X}$ (N=49)
1	7.4412	7.8776
2	7.4412	9.7347
3	8.6471	10.9388
4	12.7059	11.8571
5	8.0000	11.6122
6	11.6176	14.0612
7	7.8824	8.1429

Only on Coan 4 (Successful planning and organization) did the alcoholic sample score higher in the internal direction than did the male college student sample. It had been hypothesized that alcoholics would be likely to score much higher on Coan 5 than would a normal sample. Obviously, the results are the opposite of those predicted. In a basic sense, these measurement data argue against further exploratory work on this set of hypotheses with this particular sample.

Nevertheless, it was decided to test the hypothesis that the intercorrelations among Coan scores for the alcoholic sample would be closer to zero than would the inter-correlations among Coan scores for the college student

sample. This hypothesis can be tested by a comparison of principal components analyses of the two samples. That sample whose intercorrelations are closer to zero will show the greater independence among factors in a principal components analysis, i.e., a greater number of factors will be needed to account for the majority of the variance. Or in other words, if we were to compare the analyses of the two samples at an arbitrary cut off point of 50% of the variance, the sample with the lowest intercorrelations would need the greater number of factors to account for that 50% of the variance. The critical data from these two analyses are compared in the following table.

Table 27. Principal Components Analysis, Alcoholic and Student Sample

	% of Variance	
Factor	Alcoholic	Student
1	43.3	30.6
2	16.3	16.8
3	11.5	15.2
4	8.7	12.9
5	8.1	11.0
6	6.5	8.1
7	5.6	5.3

As Table 27. indicates, the first two factors in the analysis of the Coan scores for the alcoholic population account for 59.6% of the variance, while the first two

factors for the student sample account for 47.5% of the variance. According to the above interpretation, this means that the intercorrelations for the student sample are closer to zero than those of the alcoholic sample.

This interpretation is supported by observation of the respective analyses expressed graphically (cf. Figures on the following two pages). A comparison of these two graphs indicates that the seven scales of the alcoholic sample are more closely bunched than those of the student sample. This suggests that the scales in the alcoholic sample are less independent, and therefore that their intercorrelations are farther from zero than those of the student sample.

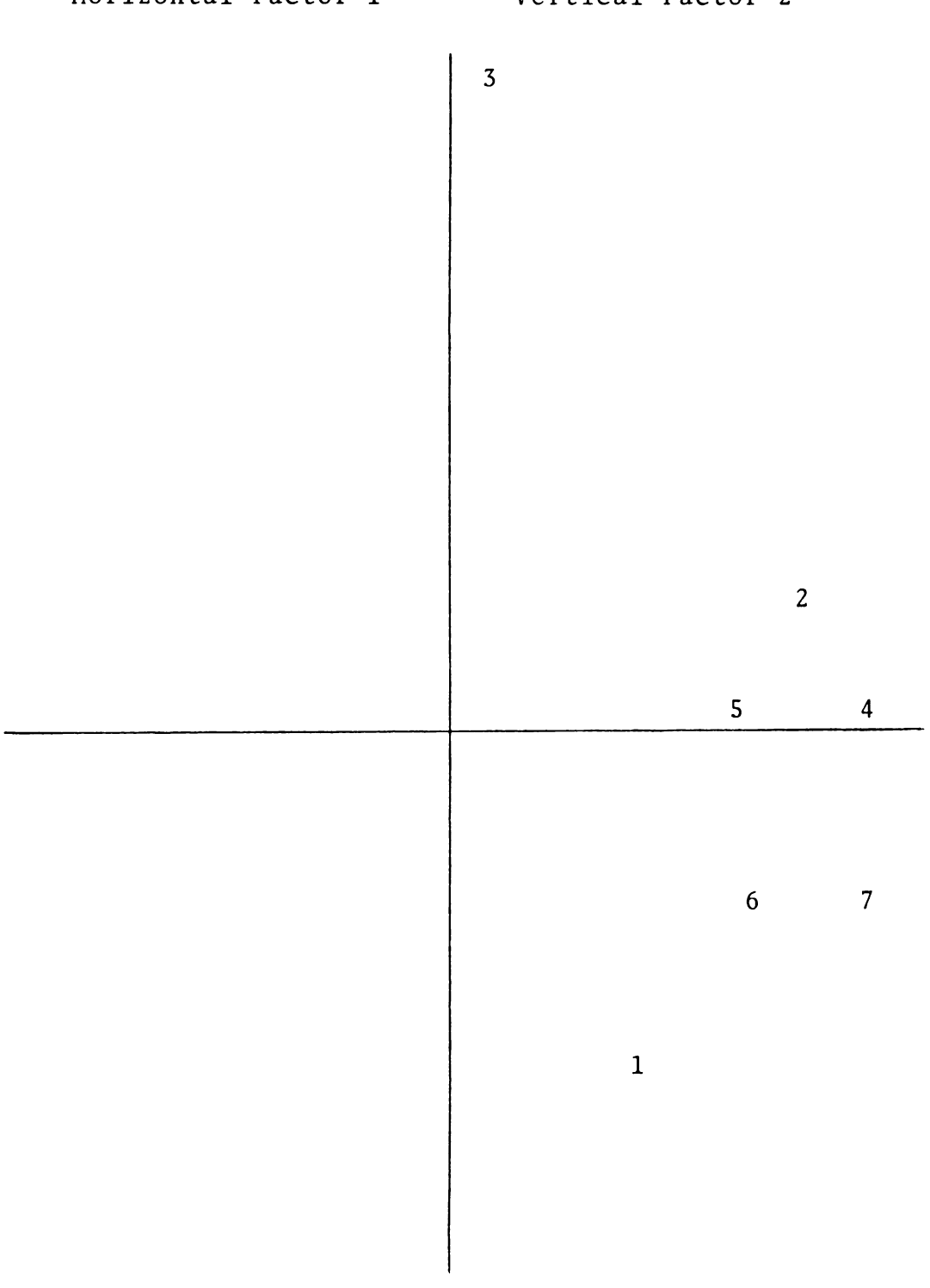

Figure 2. Principal Components Analysis, Alcoholic Sample

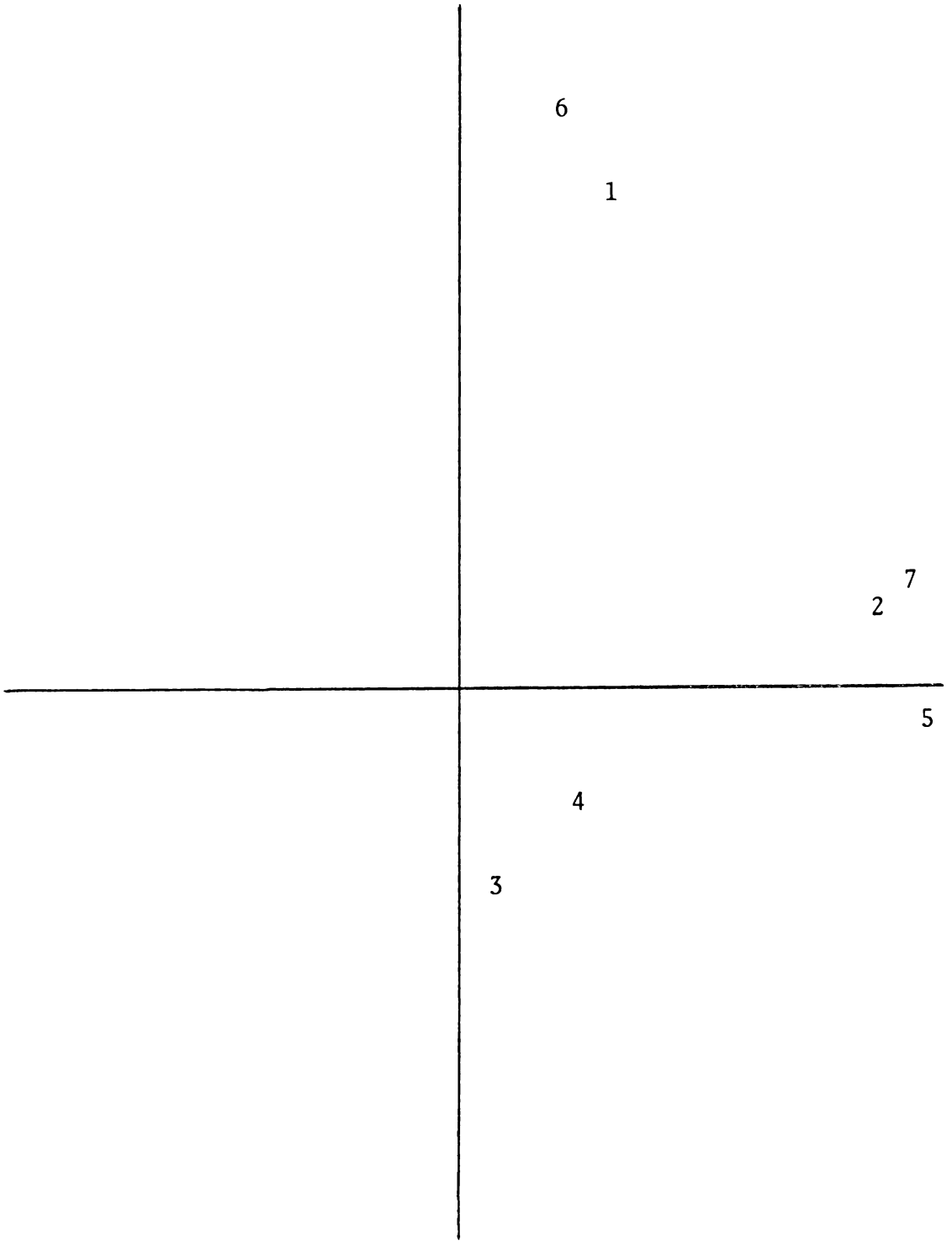

Figure 3. Principal Components Analysis, Student Sample

Again, based on even a cursory look at the data, the second set of hypotheses has not been confirmed. In fact, the results are opposite to those hypothesized.

Hypotheses: Third Set

Three I-E scales and two outcome measures were selected for the exploratory implementation of the cross-lagged panel correlation technique. Coan 5 was included because of its performance in the multiple regression analyses. The Rotter and Mirels factor 1 were included in accordance with the main purpose of the study, i.e., a comparison of measures of I-E. The Taylor and Summary Role were selected because of their demonstrated sensitivity to the I-E measures in the previous analyses. There were six comparisons altogether, and the key correlations are listed below. It may be recalled that the basic hypothesis is that $r_{\text{I-E}_1\ 0_2} > r_{0_1\ \text{I-E}_2}$, where the subscript I-E stands for each of the locus of control scales; the subscript 0 represents each of the outcome measures; and the subscripts 1 and 2 represent the pre- and post-recordings of each measure. (Significance levels are in parentheses.)

Table 28. Cross-Lagged Panel Correlations

	$r_{I\text{-}E_1\ O_2} > r_{O_1\ I\text{-}E_2}$	
Rotter & Taylor	-.2752 (.061)	-.0423 (.406)
Rotter & Summary Role	.1892 (.142)	.1656 (.175)
Mirels & Taylor	-.0285 (.438)	-.1920 (.138)
Mirels & Summary Role	.3435 (.025)	.1663 (.174)
Coan 5 & Taylor	-.5322 (.001)	-.7145 (.001)
Coan 5 & Summary Role	.1150 (.259)	.2880 (.049)

In two of the six comparisons (Rotter & Taylor, and Mirels & Summary Role), the crossed and lagged correlations are in the hypothesized direction. However, in neither of these pairs do both of the correlations approach significance at the .05 level. It may be of interest that the crossed and lagged correlations between the Coan 5 and the Taylor are both significant at the .001 level, but the relationship is opposite to the hypothesized direction. An interpretation of this relationship would suggest that if anything, anxiety tends to "cause" externality.

DISCUSSION

The original impetus for this study was to find an adequate measure of the idea of personal responsibility which might serve as a psychotherapy outcome measure. A review of the literature revealed that although this idea is held in esteem by many theorists in the area, there is no unified conceptual definition nor adequate operationalization of it. However, considerable research attention has been given to a related concept and measure, the locus of control. It was eventually decided to undertake an assessment of the usefulness of this concept and measure in a psychotherapy setting.

As mentioned, one particular measure of the locus of control (Rotter's) has received most of the research attention, so it was the most likely candidate for investigation. A dominant theme in the theoretical literature developing around this measure is a recommendation for increased differentiation. Critics object to classifying people as either internal or external, because it does not do justice to the complexity of human behavior. This theme is consistent with a more widespread and more profound movement in personality theory which calls for greater attention to individual differences and situations in lieu of the traditional emphasis on global dispositions.

A more highly differentiated measure of the locus of control (Coan's) was located and a quasi-experimental comparison of the two measures was designed. Because the original search had been for a measure of personal responsibility to be used as a psychotherapy outcome measure, the comparison was done in a psychotherapy setting. It was decided to do a multiple regression analysis using the two measures of the locus of control as predictor variables and eight standard psychotherapy outcome measures as the criterion variables. The immediate purpose of the study was not to attempt to determine whether the Coan was generally superior to the Rotter, but whether it was superior in a specific and relevant situation. This attempt was made especially in a response to a rebuttal to criticisms of his concept and measure which Rotter published in 1975. In it he mentioned his earlier work on subscales and his eventual disillusionment with them. Somewhat defensively he allowed for the development of subscales if sufficient supportive evidence could be produced, and if the specific area seemed important enough to justify the effort that would be involved. He added that subscales would naturally be somewhat superior to a generalized scale in their respective situations, and that that alone would not justify their existence. Their superiority would have to be significant.

The results of this study strongly support further investigation of a more highly differentiated concept and measure of the locus of control. In the first set of multiple regression analyses, it was not one subscale which was being compared with Rotter's generalized measure. Instead, the comparison was between the Rotter and an averaged set of scores for six out of seven of the Coan scales. This was admittedly off the point of the main thrust of the argument which based itself on the utility of increasing the differentiation of the locus of control construct. Combining the Coan scales negates the key feature of that measure. Nevertheless, the principal components analysis of the Coan pre-scores did not give support for considering six of the seven scales as independent factors. Consequently, the first set of multiple regression analyses is at this point an atheoretical, yet empirical comparison of the Rotter and Coan in their ability to account for variance in some standard psychotherapy outcome measures. It is interesting to note that the Coan "conglomerate" is clearly superior. Perhaps this is an argument for a greater number of items in a locus of control measure.

But it is the third set of multiple regression analyses which contains the real test of the first hypothesis. Having ascertained by the second set of analyses that Coan 5 was the overall best of the seven Coan scales in

predicting the criterion variables, the third set proposed to answer directly the question whether a specific subscale could be significantly better than the more general Rotter scale in a specific situation. Across the eight outcome measures, the Coan 5 accounted for an average 19.1% of the variance in these measures; the Rotter accounted for an average of 4.0% of their variance. Coan 5 showed statistically significant relationships with five of the outcome measures (and in three of these the overall analysis showed a significant relationship between predictor and criterion variables). In contrast, the Rotter did not show significant relationships with any of the outcome measures. With this relatively small sample of subjects, the Coan 5 was unquestionably superior to the Rotter in a specific, relevant situation. Furthermore, it is highly likely that Coan 5 would serve as a better psychotherapy outcome measure (directed at assessing the client's realization of personal responsibility) than would the Rotter scale.

A comparison of the Rotter and Mirels scales in the third set of multiple regression analyses reveals that the Mirels accounted for an average .015% of the variance in the criterion variables, even less than the Rotter did. And like the Rotter, it did not show significant relationships with any of the eight outcome measures. This finding is consistent with studies reported in the introduction

which failed to show that the Mirels improved predictive accuracy over the total Rotter scale. Mirels's factor 2 (belief in control over social and political events), which has received support from at least one study, was not considered in this study because it was not believed to be relevant to the psychotherapy situation.

Some further comments should be made about the findings of the principal components analysis of the Coan pre-scores and the second set of multiple regression analyses. Since Coan, a student of Cattell, had originally constructed his questionnaire on the basis of a series of item and factor analyses, it would be expected that the seven scales would represent fairly independent components of the locus of control construct. Data obtained from a college student sample of 50 men and 47 women supports this expectation (cf., Appendix G for a correlation matrix based on this data). The college student sample used for testing the second hypothesis also tends to support the independence of the scales. Nevertheless, the correlation matrix based on the subjects' scores in this study (Appendix E) shows fairly high intercorrelations among many of the scales. A valid criticism is that this latter matrix is based on a small sample (N=34), and therefore lacks the strength of the original Coan data. Furthermore, the second set of multiple regression analyses shows that the Coan scales differ markedly in their

capacity to predict the criterion variables. Across the eight outcome measures, six of the Coan scales accounted for the following averages of variance: Coan 1-2%, Coan 2-2%, Coan 4-6%, Coan 5-19%, Coan 6-1%, and Coan 7-6%. Disregarding for the moment the overall significance values of the eight analyses in this set, six of the scales taken separately showed significant relationships with the outcome measures in the following frequencies: Coan 1-1, Coan 2-0, Coan 4-4, Coan 5-4, Coan 6-1, and Coan 7-3. This data suggests important differences among the Coan scales in their relationships with the criterion variables. Perhaps the most sensible conclusion drawn from this data would be to encourage further investigation of the independent status of the Coan scales.

There does not seem to be much that can be said about the results of testing the second hypothesis. During the course of the present study, evidence from unpublished research in this area had been transmitted second-hand to the author. The results suggested that at least some groups of alcoholics proved to be more external than did samples from a "normal" population. Thus, the results of this study may be most simply interpreted as a failure to replicate results reported by Goss and Morosko (1970). One objection might be raised, and it concerns the criteria for a "normal" population sample with which the alcoholics' sample was compared. College students, especially males,

tend to score higher in the internal direction than do non-college student subjects. Consequently, although alcoholics may score higher in internality than a non-college student sample, they might still fall below a male college student sample in internality. Data for such a comparison group was unavailable for this study; however, it would not be difficult to generate. Nevertheless, one would expect that if the reported paradoxical findings were significant, that an alcoholic sample would still be slightly, even though not significantly, more internal than a male college student sample, or at least equally internal. But the results of this study do not show even a marginal greater internality for the alcoholics' sample. Presumably, other replication studies of this hypothesis are underway.

The third set of hypotheses was introduced as exploratory for several reasons, foremost among these was the sample size which all but ruled out the possibility of finding significant relationships. The relationships for this set of data tend not to be significant, nor do they indicate a trend. The one significant relationship is in the opposite direction of that hypothesized. Although these results are not in themselves encouraging of further work on this question, the question itself still seems important. Does an individual's locus of control affect his or her level of anxiety? If so, can psychotherapeutic methods

be employed in reducing anxiety by focusing on changing an individual's beliefs about control? The most sensible conclusion to be drawn from the data on this set of hypotheses is that further work, utilizing a sample of 100 to 150 subjects, ought to be undertaken. The possible implications of such a study would more than justify the effort needed.

The major conclusion drawn by the author from the results of this study is that further work is needed on the conceptualization and operationalization of the idea of belief in personal responsibility. The best existing work, Rotter's, stands in need of improvement, at least when it is applied to the area of psychotherapy; and increased differentiation, or dimensionality, is one factor in such improvement. Although Coan's measure may need improvement itself, especially over the issue of the independence of its subscales, it does seem to merit more attention than it has received. The fifth scale may itself be a valuable tool for the assessment of improvement in psychotherapy.

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Rotter's Locus of Control Scale

1. a Children get into trouble because their parents punish them too much.
   b The trouble with most children nowadays is that their parents are too easy with them.

2. a Many of the unhappy things in people's lives are partly due to bad luck.
   b People's misfortunes result from the mistakes they make.

3. a One of the major reasons why we have wars is because people don't take enough interest in politics.
   b There will always be wars, no matter how hard people try to prevent them.

4. a In the long run people get the respect they deserve in this world.
   b Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.

5. a The idea that teachers are unfair to students is nonsense.
   b Most students don't realize the extent to which their grades are influenced by accidental happenings.

6. a Without the right breaks one cannot be an effective leader.
   b Capable people who fail to become leaders have not taken advantage of their opportunities.

7. a No matter how hard you try some people just don't like you.
   b People who can't get others to like them don't understand how to get along with others.

8. a Heredity plays the major role in determining one's personality.
   b It is one's experiences in life which determine what they're like.

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9. a I have often found that what is going to happen will happen.
   b Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.

10. a In the case of the well prepared student there is rarely if ever such a thing as an unfair test.
    b Many times exam questions tend to be so unrelated to course work that studying is really useless.

11. a Becoming a success is a matter of hard work, luck has little or nothing to do with it.
    b Getting a good job depends mainly on being in the right place at the right time.

12. a The average citizen can have an influence in government decisions.
    b This world is run by the few people in power, and there is not much the little guy can do about it.

13. a When I make plans, I am almost certain that I can make them work.
    b It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.

14. a There are certain people who are just no good.
    b There is some good in everybody.

15. a In my case getting what I want has little or nothing to do with luck.
    b Many times we might just as well decide what to do by flipping a coin.

16. a Who gets to be the boss often depends on who was lucky enough to be in the right place first.
    b Getting people to do the right thing depends upon ability, luck has little or nothing to do with it.

17. a As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.
    b By taking an active part in political and social affairs the people can control world events.

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18. a Most people don't realize the extent to which their lives are controlled by accidental happenings.
    b There really is no such thing as "luck."

19. a One should always be willing to admit mistakes.
    b It is usually best to cover up one's mistakes.

20. a It is hard to know whether or not a person really likes you.
    b How many friends you have depends on how nice a person you are.

21. a In the long run the bad things that happen to us are balanced by the good ones.

    b Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.

22. a With enough effort we can wipe out political corruption.
    b It is difficult for people to have much control over the things politicians do in office.

23. a Sometimes I can't understand how teachers arrive at the grades they give.
    b There is a direct connection between how hard I study and the grades I get.

24. a A good leader expects people to decide for themselves what they should do.
    b A good leader makes it clear to everybody what their jobs are.

25. a Many times I feel that I have little influence over the things that happen to me.
    b It is impossible for me to believe that chance or luck plays an important role in my life.

26. a People are lonely because they don't try to be friendly.
    b There's not much use in trying too hard to please people, if they like you, they like you.

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27. a There is too much emphasis on athletics in high school.
    b Team sports are an excellent way to build character.

28. a What happens to me is my own doing.
    b Sometimes I feel that I don't have enough control over the direction my life is taking.

29. a Most of the time I can't understand why politicians behave the way they do.
    b In the long run the people are responsible for bad government on a national as well as on a local level.

APPENDIX A

Personal Opinion Survey (According to Scales)

Scale 1

1. Everybody can and should decide for himself what is right and wrong. (T)

8. Everyone is responsible for what he is as well as for what he does. (T)

15. Anyone who is willing to devote enough time and effort to it can attain a position of leadership or authority. (T)

22. If one wants to badly enough, he can overcome almost any obstacle in the path of academic success. (T)

28. Anyone who is willing to work hard can be successful. (T)

36. No matter how she looks to begin with, almost any woman can make herself attractive by proper attention to her hair, skin and clothing. (T)

43. Anyone can learn how to interact with people and have good friends. (T)

50. If one just follows his own convictions he can get people to respect and admire him. (T)

57. People can stay healthy all the time by getting the right food, sleep, and exercise. (T)

64. Anyone can break any bad habit if he wants to badly enough. (T)

71. If you try hard enough, you can make anybody like you. (T)

78. I think I could accomplish almost anything I wanted to if I tried hard enough. (T)

Scale 2

2. No matter how hard I try, there are some things I'll never get the hang of. (F)

9. If I had enough time and the right tools, I could

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figure out how almost any machine is put together and how it works. (T)

16. I find it very difficult to understand scientific ideas. (F)

23. If I had enough time and the right books to refer to, I could understand any kind of scientific theory. (T)

29. I never was very good at things like card games and chess. (F)

37. I've seldom been stumped by any intellectual problem I really wanted to solve. (T)

44. I have more trouble with numbers or arithmetic problems than I do with most other things I try to figure out. (F)

51. If I had the time, I could figure out the solution to almost any kind of puzzle. (T)

58. When I have a mechanical problem to solve, I usually ask someone to help me with it. (F)

65. I think I could get good grades in any subject in college if I studied hard enough. (T)

72. I've often wished that teachers or lecturers would slow down so that I could keep up with them. (F)

82. If I really worked at it, I could be an expert chess player. (T)

85. When I'm being shown how to do something, I have a lot of trouble learning. (T)

91. If I had the time, I could figure out the answer to almost any mathematical reasoning problem. (T)

97. I often have to read things over several times before I fully understand them. (F)

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102. Even if I wanted to, I don't think I could ever be a really good athlete.

Scale 3

3. We should worry less about God's will and fate, and more about what we can do about our problems. (T)

10. My life is in the hands of a divine power who insures that things happen for my own good even if I don't understand them at the time. (F)

17. Men working and thinking together can build a just society without supernatural help. (T)

24. Man cannot be trusted to manage his own affairs without some kind of supernatural guidance. (F)

30. History can teach us more about how to solve our problems than religion can. (T)

38. Society will always be imperfect because man is imperfect. (F)

45. Our increasing technology should someday enable us to control natural phenomena like the weather. (T)

52. In our scientific and medical research, we must be careful not to go against God-given laws of life and death. (F)

59. If there is a supernatural power, it is not interested in the needs and wishes of individual human beings. (T)

66. There is a law of just retribution that rewards and punishes us according to what we deserve. (T)

73. What the world needs is more tolerance and reason and less blind faith. (F)

79. Our problems can only be solved by a return to traditional religious principles. (T)

86. Scientific knowledge is the key to mankind's destiny. (F)

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92. Fate plays a greater part in our lives than most people seem to realize. (F)

98. When scientists have gained enough knowledge, we shall be able to control the future biological evolution of the species. (T)

103. It would be nice if wars could be prevented, but I think it is probably impossible. (F)

107. The idea that our lives are controlled by some kind of predestination is sheer nonsense. (T)

Scale 4

4. I do a lot of things without much planning or organization. (F)

11. I usually plan my work carefully before I start it. (T)

18. I am usually rather disorganized, and I really should try to get better organized. (F)

25. I like to schedule my time, so that I can get the important things done. (T)

32. I often have trouble organizing my work as much as I need to in order to get anything done. (F)

39. I like to have everything in order. (T)

46. My desk is usually a mess. (F)

53. I try to live by the motto: "A place for everything and everything in its place." (T)

60. I've changed my mind too often about what career I wanted to go into. (F)

67. Frequently I make a list before I go shopping. (T)

74. Living on a schedule bothers me. (F)

80. I can nearly always finish the projects I start. (T)

87. I am often late for appointments. (F)

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93. I make it a point to pay bills as soon as I get them. (T)

99. I don't plan ahead very much. (F)

104. I get annoyed by people who are always late. (T)

108. I'm often inclined to put off until tomorrow what I could do today. (F)

111. I nearly always know where to find my belongings when I need them. (T)

114. I've sometimes had to hunt for half a day for something I knew I had put away somewhere. (F)

117. On some days, I seem to waste all my time and do not accomplish anything worthwhile. (F)

119. In general, I do things deliberately, not impulsively. (T)

120. I wish that I didn't forget things so often. (F)

Scale 5

5. I almost always understand why I feel and react as I do. (T)

12. I have sometimes felt that difficulties were piling up so high that I could not overcome them. (F)

19. I seldom cry. (T)

26. I sometimes have trouble with my muscles twitching or tightening up. (F)

33. I can hide my feelings very well. (T)

40. At times, I have been so angry that I just could't help doing or saying things I wouldn't ordinarily do or say. (F)

47. I don't let things bother me the way some people do. (T)

54. Sometimes an idea runs through my mind and I can't stop thinking about it no matter how hard I try. (F)

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61. I almost always keep good control of my emotions. (T)

68. My moods swing back and forth a lot from high to low. (F)

75. I seldom have trouble with muscle spasms or cramps. (T)

81. I often have trouble getting to sleep at night. (F).

88. I'm seldom bothered by headaches. (T)

94. Sometimes I worry about something that is not really important. (F)

100. It takes a lot to hurt my feelings. (T)

105. I don't like to waste time feeling sorry for myself. (T)

109. I know how to relax for a few minutes when I'm getting tense and then go back to the grind. (T)

112. I seldom have nightmares. (T)

115. When I'm upset over something, I usually know why and what to do about it. (T)

Scale 6

6. There is nothing I can do as an individual that will affect major political events. (F)

13. The individual in this country has much influence on political and social decisions, though many people don't seem to realize it. (T)

20. It is difficult for people to have much control over the things politicians do in office. (F)

27. There is plenty I can do about what is happening in the world today. (T)

34. Even at the local level, it is difficult for one person to influence political decisions. (F)

41. I like to discuss local and national affairs with others, for I think that everyone's opinion counts. (T)

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48. Trying to change the social or political system is a waste of energy--you might as well try to fit into it. (F)

55. As a member of our society, I want to participate as fully in its decision-making process as I can. (T)

62. The people who work voluntarily for political parties accomplish little more than to keep themselves busy. (F)

69. If he is sincerely concerned, any individual can have some real influence on national and world events. (T)

76. One vote for President could make no difference in a country the size of the United States. (F)

83. People could make their individual opinions about national affairs count for much more if they'd just take the time and effort to write their elected officials. (T)

89. I don't worry much about social problems like poverty and air pollution, because there's nothing I can do about them. (F)

95. My individual influence may be small, but I can still have a definite influence on important political events by voting, writing letters, and participating in organizations. (T)

101. I feel increasingly helpless in the face of what is happening in the world today. (F)

106. In the realm of international affairs, most of us have absolutely no control over what happens. (F)

110. Talking politics accomplishes nothing but to get people angry at each other. (F)

113. It would be a good thing if more people got involved in politics. (T)

116. It's a waste of time and effort for people to get stirred up over political and military decisions they can't control. (F)

118. When I feel strongly about some issue that affects society, I think it's my duty to let people know

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how I feel. (T)

Scale 7.

7. I think I could be a successful salesman. (T)

14. I'm shy with people until I get to know them. (F)

21. I can often change a person's mind by discussing things. (T)

31. I don't think I have much influence over other people. (F)

35. If I see that people are uncomfortable, I can usually put them at ease. (T)

42. I can never think of good conversational come-backs until long after I need them. (F)

49. If I want to talk to someone I haven't met, I introduce myself and start a conversation. (T)

56. I'm more of a follower than a leader. (F)

63. Friends often come to me to "cry on my shoulder" and get my advice. (T)

70. I hate to walk into a room full of people. (F)

77. I've often wished that teachers or lecturers would slow down so that I could keep up with them. (F)

84. I've never been very good at small talk. (F)

90. People usually do as they please, no matter what I say. (F)

96. I stay out of many conversations because I can't really understand what's being talked about. (F)

APPENDIX B

APPENDIX B

Sample of Items From the Psychiatric Status Schedule

Appetite	Appetite
What about your appetite for food? (What are your eating habits like?) If unclear: (How often do you eat during the day?)	8 says his appetite is poor or that he does not eat enough.
Fatigue	Fatigue
How easily do you get tired?	9 indicates he feels tired, sleepy, or without energy.
Anxiety	Anxiety
How often do you feel anxious or tense? If unclear: (Nervous) (How much of the time do you feel this way?)	22 admits that he is often anxious. 23 admits he feels anxious most of the time.
Self-appraisal	Self-appraisal
How do you feel about yourself? Do you like yourself? If unclear: (When you compare yourself with other people, how do you come out?)	28 accuses himself of being unworthy, sinful, or evil. 29 indicates he is bothered by feelings of inadequacy or that he doesn't like himself.

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Self-appraisal	Self-appraisal
	30 indicates he is bothered by feelings of having done something terrible (guilt).
Do you feel that you are a particularly important person or that you have certain special powers or abilities?	31 in appraising himself, indicates an inflated view of his value or worth (grandiosity).
Interpersonal relations	**Interpersonal relations**
How are you getting along with people?	32 complains about the way peers or strangers treat him.
What kind of trouble do you have with people?	33 complains unduly about the way people in positions of authority or power treat him (e.g., staff members, police, employer).
Wage Earner Role	**Wage Earner Role**
(What kind of work do you do?) (During the past month, have you been working full time?) (Why not?)	139 indicates that primarily because of his psychopathology, he limits himself to part time, temporary, or transient work.

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Wage Earner Role	Wage Earner Role
How interesting do you find your (job, work)?	141 admits to an unduly strong dislike for the nature of his work.
Does anyone complain about how you do your work?	148 indicates he fails to meet task standards effectively (e.g., gets poor efficiency rating, is constantly admonished for inaccuracy or slowness).

Mate Role	Mate Role
How would you describe _____ as a person? (Nobody is perfect. What bothers you most about _____?) Are there many people whom both you and _____ enjoy being with?	183 complains that being with his mate makes him feel uncomfortable, disgusted, tense or depressed. 186 indicates there is practically no one that he and his mate both enjoy being with.

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Numbers of Items Comprising the Scales of the PSS

Depression (anxiety)	38	Housekeeper	9
Social isolation	11	Student or trainee	13
Suicide	7	Mate	10
Somatic concern	9	Parent	12
Speech disorganization	13		
Inappropriate affect	10	Subjective Distress=	
Agitation	7	Depression + Leisure time +	
Interview belligerence	16	Social Isolation + Suicide +	
Disorientation	11	Somatic Concern.	
Retardation (emotion)	15	Behavioral Disturbance=	
Antisocial impulses, acts	7	Speech Disorganization	
Overt anger	6	+ Inappropriate Affect +	
Grandiosity	6	Agitation + Disorientation	
Suspicion	18	+ Retardation (emotion).	
Leisure time impairment	15	Impulse Control = Anti-	
Drug abuse	20	Social Impulses, Acts +	
Alcohol abuse	16	Drug Abuse + Overt Anger.	
Denial of illness	10	Summary Role = Sum of	
Wage earner	13	various role scales	

APPENDIX C

APPENDIX C

Taylor Manifest Anxiety Scale (Revised)

1. I believe I am no more nervous than most others.
2. I work under a great deal of tension.
3. I cannot keep my mind on one thing.
4. I am more sensitive than most other people.
5. I frequently find myself worrying about something.
6. I am usually calm and not easily upset.
7. I feel anxiety about something or someone almost all the time.
8. I am happy most of the time.
9. I have periods of such great restlessness that I cannot sit long in a chair.
10. I have sometimes felt that the difficulties were piling up so high that I could not overcome them.
11. I certainly feel useless at times.
12. I find it hard to keep my mind on a task or job.
13. I am unusually self-conscious.
14. I am inclined to take things hard.
15. I am a high-strung person.
16. Life is a strain for me much of the time.
17. At times I think I am no good at all.
18. I am certainly lacking in self-confidence.

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19. I sometimes feel that I am about to go to pieces.
20. I shrink from facing a crisis or difficulty.

Items Selected From the Buss-Durkee Hostility Index

1. I seldom strike back, even if someone hits me first.
2. I sometimes spread gossip about people I don't like.
3. I lose my temper easily but get over it quickly.
4. Whan I disapprove of my friends' behavior, I let them know it.
5. Once in a while I cannot control my urge to harm others.
6. I never get mad enough to throw things.
7. Sometimes people bother me by just being around.
8. I often find myself disagreeing with people.
9. I can think of no good reason for hitting anyone.
10. When I am angry, I sometimes sulk.
11. I am irritated a great deal more than people are aware of.
12. I can't help getting into arguments when people disagree with me.
13. If somebody hits me first, I let him have it.
14. When I am mad, I sometimes slam doors.
15. I am always patient with others.
16. I demand that people respect my rights.
17. Whoever insults me or my family is asking for a fight.

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18. I never play practical jokes.
19. It makes my blood boil to have someone make fun of me.
20. Even when my anger is aroused, I don't use "strong language."
21. People who continually pester you are asking for a punch in the nose.
22. I sometimes pout when I don't get my own way.
23. If somebody annoys me, I am apt to tell him what I think of him.
24. I often feel like a powder keg ready to explode.
25. When people yell at me, I yell back.
26. When I really lose my temper, I am capable of slapping someone.
27. Since the age of ten, I have never had a temper tantrum.
28. When I get mad, I say nasty things.
29. I sometimes carry a chip on my shoulder.
30. I could not put someone in his place, even if he needed it.
31. I get into fights about as often as the next person.
32. I can remember being so angry that I picked up the nearest thing and broke it.
33. I often make threats I really don't mean to carry out.
34. I can't help being a little rude to people I don't like.

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35. I generally cover up my poor opinion of others.
36. If I have to resort to physical violence to defend my rights, I will.
37. If someone doesn't treat me right, I don't let it annoy me.
38. When arguing, I tend to raise my voice.
39. I have known people who pushed me so far, we came to blows.
40. I don't let a lot of unimportant things bother me.
41. Lately, I have been kind of grouchy.
42. I would rather concede a point than get into an argument about it.
43. I sometimes let my anger show by banging on the table.

Zung Depression Scale

The following questions are each answered with one of these four alternatives: a) a little of the time. b) some of the time. c) a good part of the time. d) most of the time.

1. I feel down-hearted and blue
2. Morning is when I feel the best
3. I have crying spells or feel like it
4. I have trouble sleeping at night

APPENDIX C

5. I eat as much as I used to
6. I still enjoy sex
7. I notice that I am losing weight
8. I have trouble with constipation
9. My heart beats faster than usual
10. I get tired for no reason
11. My mind is as clear as it used to be
12. I find it easy to do the things I used to
13. I am restless and can't keep still
14. I feel hopeful about the future
15. I am more irritable than usual
16. I find it easy to make decisions
17. I feel that I am useful and needed
18. My life is pretty full
19. I feel that others would be better off if I were dead
20. I still enjoy the things I used to do

APPENDIX D

APPENDIX D

Subject Consent Form

To protect you as a subject in this study, it is required that you give your signed assurance that you understand:

what you will be doing in this study,
that you are free to stop participating at any time,
that you are in no way obligated to participate,
that you may ask questions at any time,
and that your decision to participate or not to participate will in no way affect your remaining in the treatment program or your relationships with the staff.

To protect your privacy, any answers that you give while participating in this study will be kept confidential, between you and the experimenter. To insure this, you will be given a number to use on the questionnaires that will be used instead of your name. No one except the experimenter will know what answers you may have given to specific questions. After the study only you and the experimenter will know if you participated at all. The data collected in this study will become part of a doctoral dissertation and may be published in a professional journal, but it will not be available to the staff for use with you as an individual or the subjects of the study

as a group.

This study concerns people's beliefs about how much control they have over the course of their lives. The main question that this study intends to answer is: Should the popular measure of this belief now used by psychologists be replaced by a newer, possibly better measure? In turn, a better measure will mean more accurate evaluation of various kinds of psychological treatment, in particular, the treatment of alcoholism.

The procedure of this study will be as follows: you will be interviewed by the experimenter, a member of the staff, who will ask you various questions about what is going on in your life, particularly about problems you may have. You will also be given a battery of questionnaires to fill out. These questionnaires are standard instruments used by psychologists; you may find some of the questions very personal. The interview and questionnaires should take less than three hours to finish, the three hours being distributed over a couple of days. However, you will have to do them twice, once at the beginning and once at the end of your treatment, thus demanding about six hours or less of your time. Finally, you will be requested to fill out one very brief questionnaire one month after you have completed the treatment

APPENDIX D

program.

The study has been explained to me, and I agree to participate. I realize that I am free to quit participating at any time.

(signed) _____

I, the experimenter, have explained this experiment to the subject and have secured his informed consent to participate.

(signed) _____

APPENDIX E

APPENDIX E

Table 29. Correlation Matrix, Coan Pre-Scores

	Coan 1	Coan 2	Coan 3	Coan 4	Coan 5	Coan 6	Coan 7
Coan 1	1.00000	.21357	-.09664	.36101	.22941	.38688	.32241
Coan 2	.21357	1.00000	.13143	.45649	.41098	.37390	.51622
Coan 3	-.09664	.13143	1.00000	.07702	.01795	-.10320	-.15323
Coan 4	.36101	.45649	.07702	1.00000	.41669	.52165	.45443
Coan 5	.22941	.41098	.01795	.41669	1.00000	.39783	.43237
Coan 6	.38688	.37390	-.10320	.52165	.39783	1.00000	.51861
Coan 7	.32241	.51622	-.15323	.45443	.43237	.51861	1.00000

APPENDIX E

Table 30. Correlation Matrix, Outcome Pre-Scores

	SubDis	BehDis	ImpCon	Alch1	SumRol	Taylor	BusDur	Zung
SubDis	1.000	.133	.318	.265	-.156	.639	.443	.520
BehDis	.133	1.000	-.141	-.324	-.075	.094	-.200	.293
ImpCon	.318	-.141	1.000	.300	-.149	.246	.300	.102
Alch1	.265	-.324	.300	1.000	-.444	.482	.325	.261
SumRol	-.156	-.075	-.149	-.444	1.000	-.454	-.181	-.220
Taylor	.639	.094	.246	.482	-.454	1.000	.615	.530
BusDur	.443	-.200	.300	.325	-.181	.615	1.000	.173
Zung	.520	.293	.102	.260	-.221	.530	.173	1.000

APPENDIX F

APPENDIX F

Table 31. Correlation Matrix, Coan Change Scores

	Coan 1	Coan 2	Coan 3	Coan 4	Coan 5	Coan 6	Coan 7
Coan 1	1.00000	.27747	-.18315	.07397	.39453	.17532	.17732
Coan 2	.27747	1.00000	-.12925	.26621	.17572	.35743	.28127
Coan 3	-.18315	-.12925	1.00000	-.30283	-.14353	.37082	.00702
Coan 4	.07397	.26621	-.30283	1.00000	.36354	.30137	.17232
Coan 5	.39453	.17572	-.14353	.36354	1.00000	-.06200	-.03413
Coan 6	.17532	.35743	.37082	.30137	-.06200	1.00000	.48323
Coan 7	.17732	.28127	.00702	.17232	-.03413	.48323	1.00000

APPENDIX F

Table 32. Correlation Matrix, Outcome Change Scores

	SubDis	BehDis	ImpCon	Alchl	SumRol	Taylor	BusDur	Zung
SubDis	1.0000	-.1595	.2769	.1763	.0063	.2239	.0079	.2808
BehDis	-.1595	1.0000	-.1677	-.3434	-.2333	-.0091	.1433	.0279
ImpCon	.2768	-.1677	1.0000	.3470	.0007	.2954	-.0379	-.1005
Alchl	.1763	-.3434	.3470	1.0000	-.0887	.2740	.2443	.0549
SumRol	.0063	-.2332	.0007	-.0885	1.0000	-.0140	-.1016	-.0225
Taylor	.2239	-.0091	.2954	.2740	-.0140	1.0000	.5185	.3557
BusDur	.0080	.1433	-.0379	.2443	-.1016	.5185	1.0000	.3357
Zung	.2808	.0278	-.1005	.0549	-.0225	.3505	.3357	1.0000

APPENDIX G

APPENDIX G

Table 33. Correlation Matrix, Coan Student Data

	Coan 1	Coan 2	Coan 3	Coan 4	Coan 5	Coan 6	Coan 7
Coan 1	1.00						
Coan 2	.13	1.00					
Coan 3	-.17	-.05	1.00				
Coan 4	.10	.06	-.08	1.00			
Coan 5	.14	.40	.05	.31	1.00		
Coan 6	.27	.26	-.15	-.02	.13	1.00	
Coan 7	.13	.28	-.29	.15	.36	.37	1.00

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