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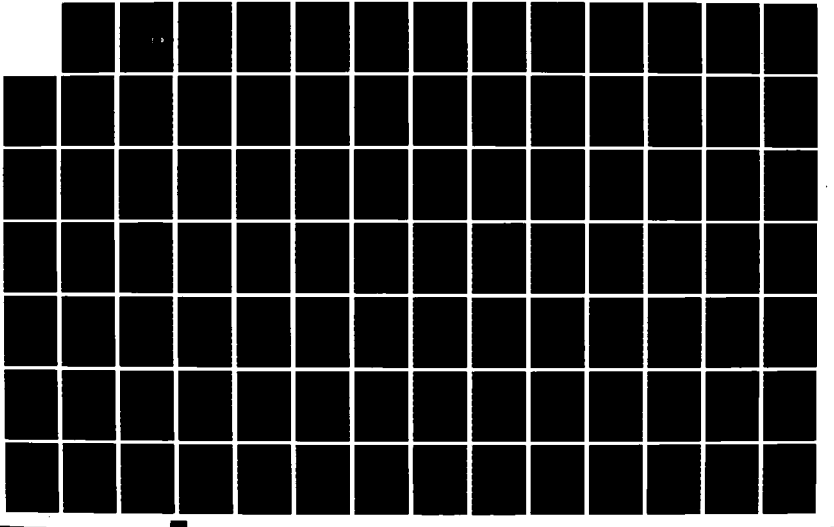

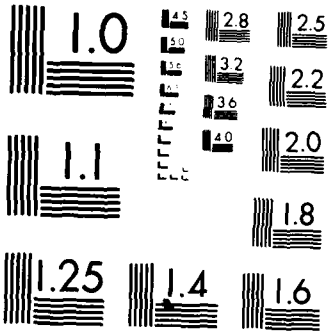

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AN ANALYSIS OF THE RELATIONSHIP
BETWEEN CONTROL DISCRIMINATION ACCURACY
AND ALCOHOL ABUSE IN THE UNITED STATES AIR FORCE

(Publication No. _____)

Richard Dowell Newsome, Ph.D.
The Florida State University, 1986

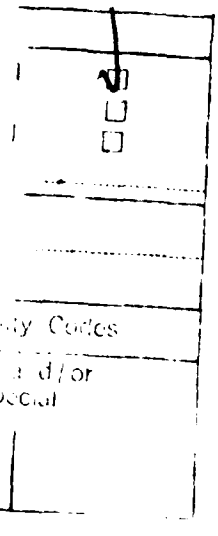
Major Professor: Curtis Harvey Krishef, Ph.D.

This study addresses the contradictory results obtained in previous research regarding the relationship between locus of control and individuals who abuse alcohol. An alternative construct, control discrimination accuracy, is suggested as a means to address the previous contradictory results. Through the development of the Control Discrimination Accuracy Typology, the construct focuses on the accuracy of control discriminations rather than on the locus of control construct's focus on perception of the location of reinforcers.

Three measurement scales were developed to make assessments of individual's control discrimination accuracy. Evaluation of the instruments revealed adequate reliability as well as adequate content, discriminant, construct, and factorial validity. Cutting scores for the scales were

developed for examination of group differences. The scales were administered to random samples of active duty Air Force members classified at various levels of drinking behavior: 1) alcoholic, 2) problem drinker, 3) non-problem drinker, and 4) non-drinker.

The main findings are: 1) Air Force active duty individuals diagnosed as alcoholic had statistically significant greater problems with control discrimination accuracy than random sampled Air Force active duty members, 2) control discrimination accuracy can function as a construct in aiding efforts to discriminate between problem and non-problem drinking groups, 3) hierarchical regression analyses indicated control discrimination accuracy explained greater proportions of variance between problem and non-problem drinking groups than the examined demographic and drinking behavior variables, and 4) the four developed Control Discrimination Accuracy Types were superior to the dichotomous locus of control orientations in characterizing individuals who abuse alcohol. Evaluation and intervention utilities for the control discrimination accuracy construct are discussed.



THE FLORIDA STATE UNIVERSITY

SCHOOL OF SOCIAL WORK

AN ANALYSIS OF THE RELATIONSHIP BETWEEN CONTROL DISCRIMINATION ACCURACY AND ALCOHOL ABUSE IN THE UNITED STATES AIR FORCE

by

RICHARD DOWELL NEWSOME

A dissertation submitted to the
School of Social Work
in partial fulfillment of the
requirements for the degree
of Doctor of Philosophy

Approved:

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August, 1986

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doing. I thank Dr. Walter Hudson, the "on the side" consultant for this research, for his enthusiastic support of me as well as others who work toward a research based social work practice.

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In conclusion, I also thank my parents, A. D. and Mae Newsome, who through their lives have taught me the value of responsible commitment to see a task through to completion.

This was the final ingredient that tied together all of the support from the many others.

To my love,
my best friend,
my editor, and
my baseball buddy...

my wife,

Cheryl

and the study's mascots --

Geronimo and Pocahontas

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CHAPTER I

INTRODUCTION

> O, God, Give us the serenity to accept what cannot be changed, courage to change what should be changed, and wisdom to distinguish one from the other.

This prayer composed by Reinhold Niebuhr in 1934 (Bingham, 1961) has become the motto of Alcoholics Anonymous. It is often referred to as "The Serenity Prayer." The words of the prayer refer to the importance of wisely distinguishing between what can and cannot be changed. The adoption of this prayer by Alcoholics Anonymous suggests that an individual's ability to wisely distinguish between what can and cannot be changed may be an important issue in alcoholism and alcohol abuse rehabilitation.

The purpose of this research was to examine the extent to which "wisdom to distinguish ... what cannot be changed ... from ... what should be changed" can function as a discriminator between alcoholic and non-alcoholic individuals. To address this purpose it was necessary to accomplish three tasks. The first task was to develop a theoretical perspective for a construct which would focus specifically on the "wisdom to distinguish" what is in the

individual's domain of control from what is not in the individual's domain of control. The next task was to develop a means to measure the construct which could demonstrate acceptable reliability and validity. The third task was to administer the instrument to a sample of alcoholic and non-alcoholic individuals to assess the extent the construct could function as a useful discriminator between alcoholic and non-alcoholic individuals.

CHAPTER II

REVIEW OF RELATED RESEARCH

Personality Traits of Alcoholic Individuals

Research into personality traits of alcoholics is not a new development. Sutherland, Schroeder, and Tordella (1950) reviewed 37 reports of organized research on personality traits of alcoholics. The oldest article cited was a 1936 study of alcoholism in men (Wall, 1936, p.1390). The general approach taken in the reviewed studies was that "alcoholism is caused by personality traits" (Sutherland, Schroeder, & Tordella, 1950, p.547). The review concluded : "no satisfactory evidence has been discovered that justifies a conclusion that persons of one type are more likely to become alcoholics than persons of another type" (p. 559).

In 1957, Syme conducted a follow-up study to the 1950 survey of alcohol personality studies. Syme concluded from his review:

> It may be premature and unjust to claim, as some have, that there is no alcoholic personality prior to alcoholism or that alcoholism is not predetermined by generic personality traits or related to them in any specific manner; nevertheless it is rather clear, on

> the basis of the evidence (all available relevant literature published from 1936 to 1956), there is no warrant for concluding that persons of one type are more likely to become alcoholics than persons of another type. Much further thought and research - with more awareness of methodological considerations and theoretical relevancy - is yet needed before any extreme position can be justified in this area. (p. 301)

Research in the area of "alcoholic personality" continued in the 1960s and 1970s. Variables, such as depression, dependency, psychopathy, sociopathy, anxiety, and neuroticism, were examined as possible predisposing variables (Marlatt and Donovan, 1981). These efforts tried to find a homogeneous constellation of personality traits which reliably differentiate alcohol abusers from non-alcohol abusers.

Locus of Control

During the 1960s and 1970s there was a change to research focusing on specific aspects of the behavior of the individual who abuses alcohol rather than on defining a global personality type. As noted by Mischel (1973) and Bandura (1977), it appeared that a potentially more productive approach to differentiating alcohol abusers from

non-abusers would be to focus on the individual's behavioral competencies and associated cognitive processes. One of the areas of this focus was the construct of "locus of control".

Development of the construct of "locus of control" has generally been attributed to Rotter (1966). "Locus of control" was defined by Rotter as the degree to which an individual perceives rewards or reinforcements as contingent upon his behavior or own attributes (Rotter, 1966, p.1). Rotter's work was not unique in conceptual framework since others such as Heider (1944); Merten (1946); and Riesman, Glazer, and Denney (1950) had written about the inner-outer metaphor. Each of these researchers attempted to draw distinction between individuals who viewed themselves as outer or inner directed. One of Rotter's contributions to research in the field of locus of control was his "I-E Scale". The development of the scale paved the way for much of the research that has since been done regarding locus of control.

One of the areas in which locus of control research has been extensively conducted has concerned individuals who abuse alcohol. Rohsenow and O'Leary's (1978) review of the literature found 25 published studies which specifically dealt with control orientation in "alcoholic populations". These studies primarily covered the period from 1970-1975.

Rohsenow and O´Leary discussed the rationale for applying locus of control research to individuals who abuse alcohol:

> Part of the process of therapy involves helping the patient discriminate causal relationships between behavior and subsequent events. Therefore, it may be that, in general, an important goal of therapy is the development of a sense of internal control in the patient. . . It would therefore seem reasonable for treatment personnel to attempt to modify the alcoholic´s generalized expectations of reinforcement toward an internal locus of control. . . Research shedding light on the control orientation of alcoholics and the relationship between control orientation and treatment method or treatment success would be desirable in planning more effective treatment programs for alcoholics. (p. 57)

Three major hypotheses have been tested concerning the locus of control of alcoholics compared to nonalcoholic controls: "(1) alcoholics have more external locus of control, (2) alcoholics realistically have more internal locus of control, and (3) alcoholics have an exaggerated degree of internal control" (Rohsenow & O´Leary, 1978, p.62). Much of the research has utilized Rotter´s "I-E Scale". Others, such as Oziel and Orbitz (1975) and Donovan (1978), have developed their own locus of control scales

designed to specifically assess individuals who abuse alcohol.

The various hypotheses that have been tested with a variety of scales have revealed contradictory results. Early studies, such as those conducted by Goss and Morosko (1970) and Butts and Chotlos (1973), predicted that alcoholics would score in the external direction on scales such as the "I-E". This prediction was based on the idea that alcoholics would have more external locus of control because they seem unable to control their drinking behavior or to cope effectively with other areas of living and tend to deny responsibility for their behavior (Butts & Chotlos, 1973). The results turned out to be in the opposite direction -- alcoholics scoring in the internal direction. Similar results of alcoholic populations being more internally directed were achieved by Tiffany, Schontz, and Woll (1969); Gozali and Sloan (1971); and Blij and Hinrichsen (1980). These results lead to the development of alternative hypotheses such as "alcoholic's perception of control may be internal to a pathological degree" (Gozali & Sloan, 1971, p.159) and "alcoholics respond internal as an overcompensating defense to their behaving as externally oriented" (Blij & Hinrichsen, 1980, p. 473).

Researchers also have had results which fit with the early predictions that the scores would be in the external

range. Donovan (1978) and Stafford (1980) had results indicating an external focus by alcoholics. Donovan stated:

> Alcoholics having an external locus of control according to scores on the DRIE (Drinking Related Internal-External) scale appear to perceive that significant events in life are beyond their control, determined more by chance than by personal initiative or the influence of significant others. Correspondingly, they feel they have minimal control over internal (intrapersonal) and external (interpersonal) sources of stress. (p. 776)

At face value there is a direct contradiction in the results of these researchers. The research has "placed" individuals who abuse alcohol at opposite ends of the internal-external locus of control continuum. The suggestion could be made that with such a wide range of results, that locus of control is not a significant factor in identifying the individual who has a behavior pattern of abusing alcohol. An alternative position would be to consider whether a modification of the locus of control construct might function better to discriminate between alcoholics and non-alcoholics.

CHAPTER III

CONTROL DISCRIMINATION ACCURACY THEORY

Previous Control Orientation Conceptualizations

During the 1960s and 1970s various models were developed to describe the locus of control construct. Paulhus and Christie (1981) identified three basic models. The first model was the traditional dichotomous Rotter Model (see Figure 1). Locus of control is described as "the degree to which the individual perceives that reward follows from, or is contingent upon, his own behavior or attributes versus the degree to which he feels the reward is controlled by forces outside of himself and may occur independently of his actions" (Rotter, 1966, p. 1).

The Collins Model (see Figure 2) was developed through factor analysis of Rotter's "I-E Scale". Rather than external locus of control functioning as a single factor, Collins (1974) found four factors addressed by the External locus of control responses on the Rotter "I-E": belief in a difficult world, a just world, a predictable world, and a politically responsive world.

The Levenson Model (see Figure 3) was a third conceptualization of the locus of control construct

Figure 1. Rotter Model of Locus of Control from Paulus and Christie (1981).

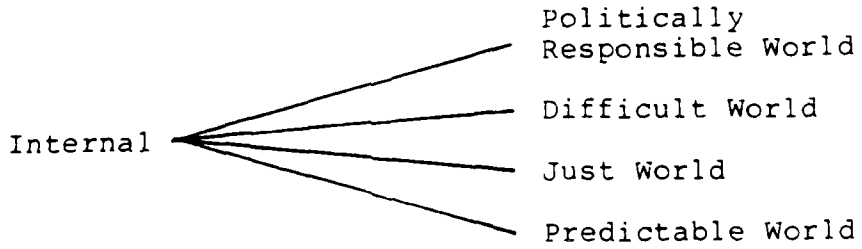

Figure 2. Collins Model of Locus of Control from Paulus and Christie (1981).

developed during the 1970s. Levenson divided the concept of external locus of control into two conceptual categories: chance and powerful others. The categories of Internal, Powerful Others, and Chance of the Levenson Model were developed out of a conceptualization that "those who believe in powerful others (one external orientation) will behave and think differently from those who feel the world is unordered and unpredictable (a second external dimension)" (Levenson, 1981, p. 17).

One further model of control was developed by Tiffany (see Figure 4) in the late 1960s (Tiffany, 1967; Tiffany, Schontz, and Woll, 1969; Tiffany, Salkin, and Cowan, 1970). In reference to Figure 4, according to Tiffany (1969):

> letter "a" represents organismic controlling forces originating within the person. Letter "b" represents the control the individual has <u>over</u> these inner states. Letter "c" represents the control an individual exerts <u>over</u> the environment, the skill or effectiveness with which he manipulates events external to himself. Finally, the letter "d" represents controlling forces coming <u>from</u> the environment. (p. 69)

Each of these conceptualizations of locus of control emphasizes the relationship between an individual's beliefs

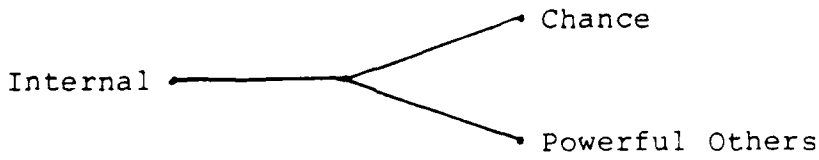

Figure 3. Levenson Model of Locus of Control from Paulus and Christie (1981).

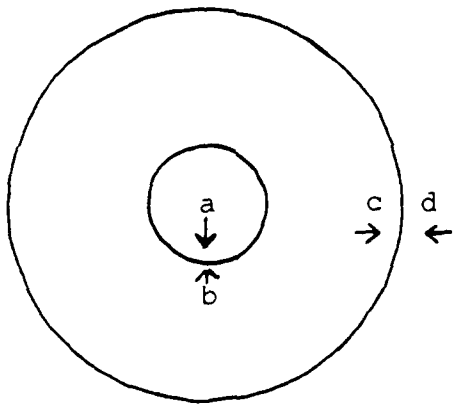

Figure 4. Tiffany Model of Locus of Control from Tiffany (1969).

or perceptions regarding control and their subsequent behavior. None of these conceptualizations address the extent to which individuals' perceptions of control locus are accurate or inaccurate -- the extent to which the individual has "the wisdom to distinguish what can be changed from what cannot be changed". These models do not address the extent to which inaccurate control discriminations affect an individual's behavior.

Rohsenow and O'Leary (1978) have suggested, as a result of their extensive review of locus of control research on alcoholic populations, that "a linear relationship between locus of control and other variables has often been presumed. However, if there is a curvilinear relationship with either extreme being unrealistic and reflecting maladjustment, a single correlation would be an inappropriate statistic" (p.74-75).

A Control Discrimination Construct

Examining the status of the locus of control construct approximately 10 years after introduction of the "I-E Scale", Rotter (1975) addressed the issue of individuals perceiving they had "more control than is warranted by reality" (p. 61). According to Rotter, there are limits on personal control which present "interesting problems that can be investigated" (p.61). Lefcourt (1982) expressed

similar beliefs by stating "the 'realism' of control expectancies should be considered as a new outcome area" (p. 183) for investigation. In concluding his examination, Rotter advocated for new methods of measurement and new scales which have theoretical justification.

In Locus of Control (1982), Lefcourt alluded to the importance for discriminations to be made between events that are controllable and those that are not. A construct labeled "control discrimination accuracy" (CDA) was suggested by this author to address this issue. Unlike the "locus of control" construct which examines the effects of individuals' perceptions of control locus on their behavior, control discrimination accuracy examines the accuracy or inaccuracy of individuals' perceptions of control locus. The underlying assumption was that from an interventive perspective there is greater value in assessing the accuracy of control perceptions than in merely knowing control perceptions. More precise measurement of the accuracy of control discriminations rather than measurement of perceptions of control orientation would be a contribution to delineating "accurate control discrimination" training as an area to address in alcohol abuse rehabilitation.

This reconceptualization of the traditional view of locus of control took into consideration the problems that have existed in the past with using locus of control

orientation (internal versus external) as an indicator for intervention. Rohsenow and O'Leary's (1978) research identified that the locus of control construct has been used traditionally as an indicator of where the individual's control orientation could be placed in reference to the ideal of exerting some control over events affecting the individual, internal control.

A problem with the emphasis on valuing an internal locus of control is that accuracy of the individual's perception of what was within his or her control was not closely examined by the instruments assessing the individual's locus of control. Even though Rotter (1966) initially discussed locus of control as a curvilinear function, much research using the construct has been designed "to show the superiority of internals over externals" (Wong, 1984, p. 330). Wortman and Brehm (1975) and Strickland (1978) criticized this emphasis by discussing the danger of emphasizing personal control when the individual is facing an uncontrollable problem. A construct of control discrimination accuracy would address this danger and provide information for therapists to address modification of inaccurate control discriminations.

Assumptions of Control Discrimination Accuracy Theory

Control discrimination accuracy as a construct follows

a phenomenological view. This view focuses on the "essential contact between consciousness and the world" (Thevenaz, 1962, p. 47). In establishing a means to discriminate between what the individual can and cannot change, a basic distinction can be made at a phenomenological level of human neurological activity. "Within the individual's control" refers to what the individual does (motor activity), says (another motor activity), thinks (neurological activity), and feels (logical conclusion from emphasis on mediating role of cognitions in development of affect). This implies the individual is potentially capable of doing, saying, thinking, and feeling anything which is in the individual's physical (anatomical and physiological) capacity to do.

The domain of individual control is primarily based on an assumption that human beings are self directed organisms through self controllable neurological processes which direct motor activities, speech activities, cognitive activities, and consequently, experienced affect. An additional assumption is that under normal conditions (conditions other than experimental neurological conditions such as direct stimulation of the cortex, or psychoactive drug therapy, treatment, or experimentation) the individual is the sole controller of his or her neurological processes that can be intentionally controlled.

From this perspective, environmental influences such as what others do and say, as well as events that occur in the world, are viewed from a mediational model (Craighead, Kazdin, & Mahoney, 1981). Mahoney (1977) has stated that a basic assertion of the mediational model of behavior is that "the human organism responds primarily to cognitive representations of its environments rather than to those environments per se" (p. 7). The environment is perceived as playing an influential role in human behavior, not a deterministic one.

The domain of "beyond individual control" is primarily defined as a consequence of how the domain of individual control is defined. An assumption is made that all individuals function in the same fashion as that described regarding the domain within the individual's control. Since in situations other than the described exceptions each individual functions as the sole agent with capability to control neurological functions that can be intentionally controlled, no individual is able to control these functions for any other individual.

It is important to note that the described domain of what is within the individual's control should not be equated with extreme concepts which describe individuals as capable of doing anything if he or she spends the necessary effort (Erhard, 1976). To the contrary, there are specific

limitations to what the individual is capable of doing related to hereditary, nutritional, physiological, and anatomical factors.

The Control Discrimination Accuracy Typology

The discussed domains of control can be described in a resulting Control Discrimination Typology (see Figure 5). From this perspective, the issue is not whether human behavior is controllable or uncontrollable, but rather accurate discrimination of where the control lies (Wong and Sproule, 1984). With an emphasis on the accuracy of locus of control perceptions, this perspective differs from the locus of control construct's emphasis on how perceptions of control locus affect behavior (Lefcourt, 1982). A particular skill becomes increased control discrimination accuracy rather than the traditional goal with the locus of control construct of increased internal locus of control.

Development of Control Discrimination

There are various theoretical perspectives regarding the development of the type of thinking involved in connecting control discriminations with causation thinking. Developmental theory proposes that the primary experiences of causation thinking begin in the early stages of an infant's development (Reid and Ziegler, 1981). According to Piaget (Flavell, 1963) the infant will initially believe

From the perspective of the individual:

Within the Individual's Control

What he/she
1) does
2) says
3) thinks
4) and consequently, feels

Not Within the Individual's Control

What other individuals
1) do
2) say
3) think
4) and consequently, feel

Figure 5. The Control Discrimination Accuracy Typology.

that every event of which he or she is aware is a consequence of the infant's own activity. Eventually the child passes through a stage in which explanations of causation are animistic. This stage involves the child attributing motivational causations to all external objects, whether animate or inanimate.

Piaget has viewed the development of the concept of causation in children as a parallel process to the child differentiating objects from self. As the child's understanding of the immediate environment becomes more complex, so does the perception of causation. In the process of distinguishing self from parents or guardians the child begins to construct specific internal-external dimensions involving his or her personal determination versus the parent's or guardian's control (Flavell, 1963).

Attempts at explaining the development of causation thinking have also been made from a biological perspective. Averill (1973) has proposed that human beings as a highly adaptive species have a strong biological predisposition for personal control. Biological predisposition theory holds that situations where humans are deprived from control or causation have multiple biological effects on the individual. Other than relying on anecdotal accounts of the effects of imprisonment or the effects of sensory deprivation, the biological parameters of causation thinking

have not been extensively studied (Reid and Ziegler, 1981).

Causation thinking has also been examined from a social learning perspective. Seligman (1974) and Abramson (1978) have both focused their research on the extent to which repeated experiences of ineffective expenditure of effort effect the control orientation of organisms. Their research on "learned helplessness" has suggested that a combination of individual's experiences and the causal attributions made regarding locus of control function to guide individual's causation thinking (Abramson, Seligman, and Teasdale, 1978).

One additional perspective for examining causation thinking could be developed from the perspectives of social psychology (Lindesmith and Strauss, 1968) and the psychology of visual perception (Haber and Hershenson, 1973; McConnell, 1974). These perspectives could be especially useful for examining the development of control discrimination perceptions. From Lindesmith's (1968) social psychology perspective, behavior is determined by what one believes to be true. The manner in which inner experiences are defined shapes and directs behavior.

To the extent that individuals deal with the world on the basis of how the world appears to the individual, the potential for control discrimination misperceptions can be identified. Referring to the two basic early developmental

causation perspectives of perceiving all consequences as the result of the individual's own behavior and animistic perceiving of causative motivation in all objects (Flavell, 1963), the potential for misperceptions is quite high. It is not a necessary consequence for the individual to receive feedback that perceptions of causation are inaccurate. For example, the experience of the child smiling at an individual followed by an attentive response from the individual can potentially be perceived as a response controlled by the child rather than a chosen response from the viewer of the child's behavior. Repeated experiences of this type can lead to intentionality on the child's part of emitting a smile with the belief that it will cause a particular desired response. If the desired response is emitted, the perception of control is reinforced.

Expanding this particular pattern over a range of innumerous experiences can function to reinforce beliefs by the child that what others do, say, think, and feel are within the child's control. Additional reinforcement for this perception can come from verbal expressions from others regarding the extent to which the child "makes" others happy, sad, upset, or whatever as a result of the child's behavior.

An additional type of experience the child can have is one of feeling "sad" or "bad" after being called "a name"

such as "dumb" or "stupid" by a peer. This experience of undesired affect following an external event can be easily attributed by the child to the external event. The plaintive child expresses that the speaker has made the child feel bad. Such experiences reinforce the child's perception that others can determine his or her feelings as well as the speaker's perception that he or she can actually determine the feelings of others.

From these not atypical experiences, the potential for a control discrimination perspective nearly opposite of the perspective described in the "Control Discrimination Accuracy Typology" is possible (see Figure 6). Since theoretically the control discrimination perception described in Figure 6 is developed through observation, the nature of a control discrimination of this type can be viewed through the concept of "illusion". In general language usage, "illusion" refers to "the state of being intellectually deceived or misled" (Webster's New Collegiate Dictionary, 1973). As with "magical" illusions, the illusions that can lead to control discrimination misperceptions have the appearance of being just the way they seem to be. The major difference is that generally a cognitive discrimination is made when viewing a "magical" illusion that what appears to the individual to be occurring is not really occurring but in fact is an illusion.

From the perspective of the individual:

Within the Individual's Control

What other individuals
1) do
2) say
3) think
4) and consequently, feel

Not Within the Individual's Control

What he/she
1) does
2) says
3) thinks
4) and consequently, feels

Figure 6. The Illusionary Control Discrimination Typology.

For example, few view the "sawing of a woman into two" with the response of viewing a murder, which of course this would be if it were real and not an illusion. To the contrary, such a "potentially catastrophic event" is generally viewed with a degree of amazement and wonder, but certainly seldom with horror unless the viewer has not made a cognitive discrimination that what is being viewed is an illusion. Basic control discriminations are often made without the same type of cognitive discrimination made when watching a "magical" illusion. Seldom will the individual with a pattern of control discrimination misperceptions make a self-statement of the nature that: "It appears as if my behavior has caused a specific response by another but actually their responses are not within my domain of control." This contrast between "magical" illusions and control discrimination illusions emphasizes the importance of making cognitive discriminations between the way control appears to function and the actual domain of control possessed by the individual.

Philosophical focus on the importance of control discrimination accuracy dates back to at least the First Century. Epictetus, First Century teacher of Stoicism, wrote:

> In our power are our way of thinking, conation, appetition, and aversion; in a word all that is <u>our</u>

> doing. Not in our power are our body, our possessions, reputation and office; in a word all that is not our doing.... Remember then that if you take to be free what is of its nature enslaved and think what belongs to other to be your own, you will be obstructed, you will grieve, ... but if you think nothing is yours but what is yours and the alien is alien, no one will ever compel you, you will blame no one, you will do nothing against your will. (Sandbach, 1975, p. 165)

Epictetus strongly emphasized the dysfunctional consequences of confusing what cannot be controlled with what can be controlled. This focus is congruent with the control discrimination accuracy construct.

From a control discrimination perspective, it could be proposed that orientations of control that are not accurate are "less adaptive" than accurate orientations of control. The practical consequences of a control orientation with the individual perceiving what others do, say, think, and consequently, feel as within the individual's control is that effort at interpersonal problem solving may not be directed in a manner for desired results to be achieved. In other words, such a misperceived control orientation resulting in extensive effort in trying to control what others do, say, think, and consequently, feel would logically result in deficiencies in interpersonal problem

solving. Without accurate control discrimination, the individual is at high risk for being in a position for ineffectual expenditure of effort in resolving interpersonal problems, regardless of how extensive the effort.

A control discrimination accuracy construct provides the opportunity to address the accuracy of control orientations and provide useful information for guiding intervention. Levenson (1981) has stated that "with a more differentiated view of locus of control, one might devise training programs that could focus on teaching behavioral contingencies geared to the person's present expectation orientation" (p. 54). In congruence with this concept, rather than intervention approaches utilized with the locus of control construct of targeting toward a shift to a more internal locus of control orientation (Lefcourt, 1972), the control discrimination construct provides information to address erroneous control orientations whether they are in the internal or external direction.

Conceptual Model for Control Discrimination Accuracy

Unlike the locus of control construct, the control discrimination accuracy construct does not focus on placing a person on a continuum of internal-external control but instead focuses on assessing the accuracy of individual's control discriminations through the perspective of the

domains of control identified in the Control Discrimination Accuracy Typology. By viewing the internal domain as within or not within the individual's control and the external domain as within or not within the individual's control, four discrimination accuracy types (CDA-Types) can be developed (see Figure 7).

Theoretically, each CDA-Type describes a particular style of control discrimination. CDA-Type 1 individuals would be individuals who exercise controls within their internal domain of control (the internal domain of the Control Discrimination Accuracy Typology) and do not restrict possible choices in the internal domain. CDA-Type 1 individuals would be individuals who do not attempt to control the elements in the external domain of control (the external domain of the Control Discrimination Accuracy Typology). From the perspective of the Control Discrimination Accuracy Typology, CDA-Type 1 individuals would be classified as accurate control discriminators.

CDA-Type 2 individuals would be individuals who exercise controls within their internal domain and do not restrict possible choices in the internal domain. Unlike CDA-Type 1 individuals, CDA-Type 2 individuals would be individuals who attempt to control the elements in the external domain of control. From the perspective of the Control Discrimination Accuracy Typology, CDA-Type 2

		Internal Domain of Control	
		Accurate	Inaccurate
External Domain of Control	Accurate	CDA-Type I	CDA-Type III
	Inaccurate	CDA-Type II	CDA-Type IV

Figure 7. Control Discrimination Accuracy Types Model.

individuals would be individuals who believe they can control not only what they do but also what others do. These individuals would generally view the locus of control for all outcomes as internal.

CDA-Type 3 individuals would be individuals who do not exercise controls within their internal domain and restrict possible choices in the internal domain. CDA-Type 3 individuals would be individuals who do not attempt to control the elements in the external domain of control. From the perspective of the Control Discrimination Accuracy Typology, CDA-Type 3 individuals would be individuals who believe they do not control what they do nor what others do. These individuals would generally view the locus of control for all outcomes as external.

CDA-Type 4 individuals would be individuals who do not exercise controls within their internal domain and restrict possible choices in the internal domain. CDA-Type 4 individuals would be individuals who do attempt to control the elements in the external domain of control. From the perspective of the Control Discrimination Accuracy Typology, CDA-Type 4 individuals would have a control discrimination perspective that is the reverse of CDA-Type 1 individuals. CDA-Type 4 individuals would believe they can control what others do, yet at the same time, believe that others control what they do.

Theoretically, CDA-Type 2 and CDA-Type 3 individuals would be the individuals best fitting the dichotomous locus of control model. CDA-Type 2 individuals with their emphasis on control of both domains of control would be representative of the internal locus and CDA-Type 3 individuals with their emphasis on no control over either of the domains of control would be representative of the external locus.

CDA-Type 1 and CDA-Type 4 individuals with a blend of internal and external locus of control orientations do not fit the dichotomous locus of control model. From a control discrimination accuracy perspective, CDA-Type 4 individuals are the poorest control discriminators since both the internal and external domains of control are perceived inaccurately. If the locus of control construct does not address CDA-Type 4 individuals, then the locus of control construct may not be able to identify the individuals who have the most problems with control discrimination accuracy. If control discrimination accuracy can function as a discriminator between alcoholic and non-alcoholic individuals then a measurement scale specifically addressing control discrimination accuracy would be a more appropriate instrument than a scale addressing locus of control.

Control Discrimination Accuracy Construct and Alcohol Abuse Intervenion

In reference to relationship between control discrimination illusions and alcohol abuse, Hinrichsen (1976) has suggested that there is a tendency for some alcoholics to manifest exaggerated "illusions of control". This suggestion is based on findings indicating alcoholics identified by the Rotter "I-E Scale" as internally oriented seemed to behave as though externally oriented when they responded to subtle influences and when they stated preferences for tasks containing built-in rationalizations for failure (Hinrichsen, 1976; Blij and Hinrichsen, 1980).

Conceptual linkage can be made between the suggestion of exaggerated "illusions of control" by individuals with a pattern of chronic alcohol abuse and Rohsenow and O'Leary's (1978) summation suggesting locus of control is a curvilinear function in alcohol abuse populations. These individuals whose responses result in the extreme scores forming a curvilinear function in the measurement of locus of control can be perceived as manifesting "illusions of control". In connection with this line of reasoning, it could be suggested that the extreme internal responses manifest an "illusion" on the part of the individual that he or she can control what others do, say, think, and feel.

The extreme external responses manifest an "illusion" on the part of the individual that his or her own domain of control (what he or she does, says, thinks, and consequently, feels) is controlled by external sources. Measurement of control discrimination in a population of individuals with a pattern of alcohol abuse could serve to assess the extent to which "illusions" of control are present and the extent to which these "illusions" play a role in the individual's behavior through comparison of control discrimination to a comparable population of individuals without a pattern of chronic alcohol abuse.

Rohsenow and O'Leary (1978) identified a linkage between control orientation and treatment of individuals with a pattern of chronic alcohol abuse. The potential intervention value of a control discrimination accuracy construct is related to deficiencies in interpersonal problem solving that have been shown in research with individuals who abuse alcohol (Platt, Scura, and Hannon, 1973; Intagliatia, 1978; Appel and Kaestner, 1979). It has been proposed that an excessive degree of belief in internal control is less adaptive than a moderate degree (Hinrichsen, 1976; Rohsenow and O'Leary, 1978; Wong and Sproule, 1984). Problems with adjustment can be found in individuals who perceive themselves to be entirely at the mercy of external circumstances as well as persons who believe they are

responsible for each and every important event that occurs throughout their lifetime (Lefcourt, 1982).

CHAPTER IV

METHODOLOGY AND PROCEDURES

Problem Statements

The preceding review of the literature combined with the delineation of a control discrimination accuracy construct indicated that investigation of control discrimination accuracy as a discriminator for identifying individuals with a pattern of chronic alcohol abuse may be superior to previous research focusing on the locus of control construct. The problems considered in this research were viewed from this perspective. Two specific problems were addressed:

1. Do Air Force active duty individuals who have been admitted to an Air Force Alcohol Rehabilitation Center have greater problems with control discrimination accuracy than a general sample of Air Force active duty individuals?

2. Is there a correlation between Air Force active duty individual's extent of problems with alcohol abuse and measured control discrimination accuracy?

The specific problem statements represented problem

statements of a more general nature:

1. Do individuals who have been diagnosed as alcoholic and individuals who consume but do not abuse alcohol differ in control discrimination accuracy?

2. Do individuals who have been diagnosed as alcoholic or identified as problem drinkers have greater problems with control discrimination accuracy than individuals who have no history of problems with alcohol abuse?

3. Is there a positive correlation between the degree of the individual's alcohol abuse and measured deficits in control discrimination accuracy?

The three general problem statements addressed a basic issue of whether deficits in control discrimination accuracy significantly discriminate individuals who have been diagnosed as having problems with alcohol from individuals who consume alcohol but have no identified history of problems with alcohol. The general problem statements also addressed the issue of whether the greater the degree of an individual's problems with alcohol is positively correlated with greater deficits in control discrimination accuracy.

The selected problem statements were considered to be elements for addressing an overall broad general question of whether identification of problems with control

discrimination accuracy could function as an indicator for individuals who are at significant risk for alcohol abuse. This question was concerned with the predictive validity of the control discrimination accuracy construct.

The cross-sectional survey design of this research was viewed as potentially useful in laying the groundwork for a future longitudinal study if the results of the survey indicated the control discrimination accuracy construct functioned to discriminate between individuals who were identified as having various levels of problems with alcohol abuse and individuals who were identified as not having problems with alcohol abuse.

Significance of Problem Statements

The extent of both social and personal problems in the United States associated with alcohol abuse have been documented in numerous sources (Comptroller General of the United States, 1980; Cahalan & Room, 1974; National Institute on Alcohol Abuse and Alcoholism, 1978). Estimates of the number of "alcoholics" in the United States range from 5 to 15 million (Armor, Polich, & Stambul, 1978; Maultsby, 1978; Marlatt, 1979). "Any problem that affects the general population so pervasively (as alcohol abuse) is also likely to affect military forces" (Polich and Orvis, 1979, p. 1). In 1976, the U.S. General Accounting Office

estimated that $16.7 million was expended by defense agencies in Fiscal Year 1976 to treat military alcohol problems. By 1978, this figure had increased to $40 million with $13.1 million expended on Air Force alcohol abuse programs alone (Marsh, 1979).

The Rand Corporation (Polich and Orvis, 1979) conducted an extensive survey of Air Force personnel during the late 1970s to derive baseline data regarding the prevalence of alcohol abuse in the Air Force. The estimated prevalence rates were that 4.6% of Air Force personnel may be termed dependent on alcohol. An additional 9.3% were defined as having adverse affects from alcohol during the previous year, but were not alcohol dependent.

The Rand Corporation study (Polich and Orvis, 1979) of alcohol problems in the U.S. Air Force proposed a model for describing alcohol abuse in the Air Force (see Figure 8). The Rand Corporation model did not address possible etiology for "high alcohol consumption". The focus was on the results of high alcohol consumption. This research design was conceptualized to be congruent with the Rand Corporation model through an expansion of the model to address issues of possible factors that contribute to high alcohol consumption. This design specifically addressed the extent to which inaccurate control discrimination plays a role in problem drinking and alcoholism.

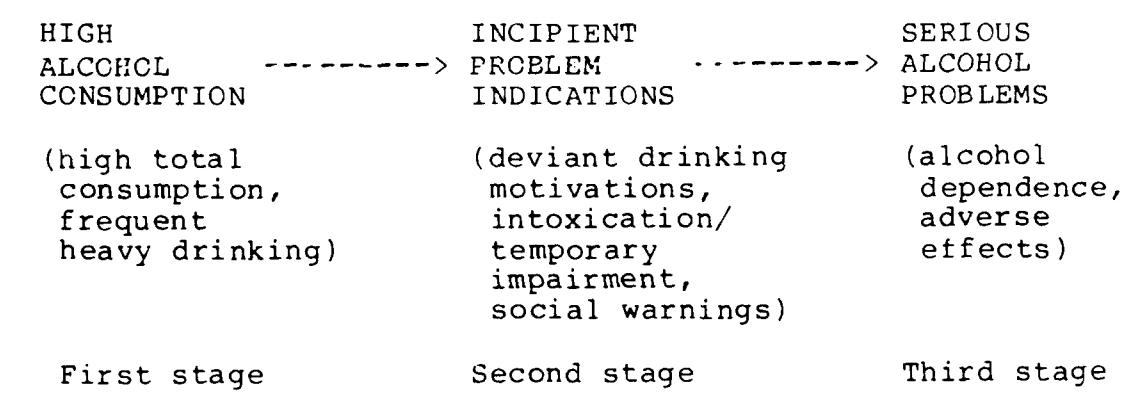

Figure 8. Hypothetical Seguence of Alcohol Problem Development from the Rand Corporation (1979).

Research findings by Hauge (1979) indicated the most frequent reason cited by Air Force ARC rehabilitants for drinking was to handle unwanted feelings. This result accented the importance of intervention approaches focused on the etiology of developing unwanted feelings and means to modify unwanted feelings through methods other than alcohol abuse. With control discrimination accuracy as a means to minimize incidents in which the individual feels a lack of personal control (Marlatt & Donovan, 1981), this research was designed to address etiology factors in the creation of "unwanted feelings" by individuals who abuse alcohol.

In order to address problems of alcohol abuse, the Air Force has operated centralized Alcohol Rehabilitation Centers (ARCs) since 1966. In April, 1971, Air Force Regulation 160-12 was published, formally recognized alcoholism as a treatable condition in the Air Force. Through the 1970s the Air Force program was expanded from the initial one ARC at Wright-Patterson Air Force Base in 1966 to 11 ARCs covering the continental United States as well as Europe and the Pacific region.

In actual practice, the Air Force alcohol rehabilitation program functions as a cooperative effort between local base resources, primarily the base Social Actions Program, and the regional ARCs. "Eighty-five percent

of the treatment and rehabilitation for alcohol abuse in the Air Force is conducted locally" (Marsh, 1979, p. 69). A rehabilitation regime is designed for each individual by a rehabilitation committee consisting of the unit commander, an immediate supervisor, an alcohol abuse rehabilitation specialist, and a medical officer. The individual's progress is monitored by the committee. The more serious cases, those with at minimal a diagnosis of alcoholism by a medical officer, are referred to the ARCs.

In 1980, the Air Force increased the referral rate of individuals for evaluation of possible problems with alcohol abuse. Air Force Regulation 30-2 was revised to make referral for evaluation of problems with alcohol abuse mandatory following an incident of driving while intoxicated (DWI), driving under the influence of alcohol (DUI), public intoxication, or an incident where alcohol was a contributing factor. As a result of the revision, individuals could be seen for evaluation which might not have reached such a dysfunctional level as many of the previously referred individuals. The element of increased early identification through mandatory referral served to create a situation where the ability to assess the extent of an individual's problems with alcohol abuse became a more complex task for local base personnel involved in the evaluation process.

From a perspective of the operation of the Air Force alcohol abuse rehabilitation program, the identified problem statements of this research could be viewed as goaled toward improved methods in early identification of individuals having problems with alcohol abuse. Pursuit of constructs which can serve to aid in discriminating between individuals who are at risk for chronic problems with alcohol abuse as compared to individuals involved in isolated incidents of alcohol abuse is an endeavor which could serve to assist evaluators in improving the precision of their evaluations. Specific testing of the control discrimination accuracy construct with an Air Force sample was an effort to assess the extent to which the control discrimination accuracy construct could be used as an additional aid in evaluating individuals referred for an assessment.

Hypotheses Statements

H1: Air Force active duty individuals who have been admitted to an Air Force Alcohol Rehabilitation Center have greater problems with control discrimination accuracy than a general sample of Air Force active duty individuals.

H2: There is a negative correlation between Air Force active duty individual's extent of problems with alcohol abuse and measured control discrimination accuracy.

Definitions of Hypotheses Terms

Air Force active duty individuals -- military persons fully employed in the United States Air Force so as to exclude inactive reserve, national guard, and civilian individuals. Operationalization of "Air Force active duty individuals" was achieved through being listed in the category by the Air Force Military Personnel Center at Randolph Air Force Base, San Antonio, Texas.

Air Force Alcohol Rehabilitation Center -- one of the 11 in-patient alcohol rehabilitation programs operated by the United States Air Force.

Extent of problems with alcohol abuse -- the degree to which the individual has been evaluated by a medical professional (medical doctor, psychiatrist, psychologist, or social worker) or self reports to have problems with alcohol abuse. Operationalization of "extent of problems with alcohol abuse" was achieved through categorizing individual's drinking behavior into five categorizations of substance use:

1. Alcoholic individuals -- individuals diagnosed by a medical officer as alcoholic and referred to an Air Force Alcohol Abuse Rehabilitation Center or local base Social Actions program for rehabilitation.
2. Problem drinking individuals -- individuals

diagnosed by a medical officer as problem drinker and entered into a local base Social Actions substance abuse rehabilitation program.

3. Self report problem drinking individuals -- general sample individuals not diagnosed by a medical officer as alcoholic or problem drinkers who self report alcohol consumption and at least one alcohol related incident (as described in the General Information Survey) within the past year.
4. Self report non-problem drinking individuals -- general sample individuals not diagnosed by a medical officer as alcoholic or problem drinkers who self report alcohol consumption but no alcohol related incidents (as described in the General Information Survey) within the past year.
5. Self report non-drinking individuals -- general sample individuals not diagnosed by a medical officer as alcoholic or problem drinkers who self report no history of alcohol consumption.

General sample of Air Force active duty individuals -- a random sample of Air Force active duty individuals drawn from general base populations.

Greater problems with control discrimination accuracy -- a lower number of accurate control discriminations made by an individual. This conceptualization exists within the context of the "Serenity Prayer" associated with Alcoholics

Anonymous:

> O, God, Give us the serenity to accept what cannot be changed, courage to change what should be changed, and wisdom to distinguish one from the other.

Categories of the control discrimination accuracy construct were conceptually expressed in the Control Discrimination Accuracy Typology. "Greater problems with control discrimination accuracy" was operationalized through measurement of the individual's control discriminations using the "Internal Control Discrimination Accuracy" and "External Control Discrimination Accuracy" subscales of the Personal Orientation Inventory.

Methodology

Population

The population for this study was Air Force active duty individuals. Samples of this population were taken from three subgroups of the population. In all of the data gathering processes, it was emphasized to the respondents that participation was voluntary. It was also emphasized that any answers given would be strictly confidential and used for research purposes only. Respondents were advised that no individual information would be given to the Air Force and that the results would be used for statistical

summaries only.

Description of the Sample Procedure and Data Collection

One sample was composed of active duty Air Force individuals who had been referred to an Air Force Alcohol Rehabilitation Center (ARC) for in-patient rehabilitation. In order to be referred to an Air Force ARC each of these individuals had been diagnosed as alcoholic under the criteria of the Diagnostic and Statistical Manual of Mental Disorders, Third Edition (DSM-III) by a medical officer (Air Force Regulation 30-2). The uniformity in criteria for classifying individuals as alcoholic was considered as an approach that addressed the criticism of non-specific use of the term "alcoholism" in much of the research in the field of alcoholism (Horn & Wanberg, 1970; Lang, 1983).

The sample of active duty Air Force individuals who had been referred to an Air Force ARC was drawn from the Alcohol Rehabilitation Center at United States Regional Hospital Sheppard, Sheppard Air Force Base, Texas. The Sheppard ARC, in accordance with Air Force Regulation 160-36, functioned as an overflow facility for the seven other Air Force ARCs in the continental United States. Since individuals were referred to the Sheppard ARC from all across the United States, the individuals referred to the Sheppard ARC were theorized to be representative of individuals referred to

the Air Force ARCs across the continental United States. As a cross-check, the representativeness of this sample was assessed through comparison to previous representative research (Hauge, 1979; Myers, 1983) describing various characteristics of individuals who have been admitted to an Air Force ARC in the continental United States as well as the overseas ARC's. These characteristics were age, officer-enlisted ratio, educational level, gender ratio, ethnic group, marital status, and time in the military.

From September, 1985 through February, 1986 each active duty Air Force member who was admitted to the Sheppard ARC was given the research survey package to complete. A total of 89 completed survey packages was collected from the Sheppard ARC. Prior to administering the survey instrument package the staff members at Sheppard ARC were instructed in the administration of the instruments. Staff members at the ARC were Air Force medical officers and enlisted psychiatric technicians. The instruction was conducted by the researcher. Completed survey instrument packages were retained by the Sheppard ARC Director and mailed to the researcher at the end of each month.

A second sample of active duty Air Force individuals was drawn from local base alcohol abuse rehabilitation programs. Each base operates a local alcohol abuse rehabilitation program through the Social Actions Office.

One part of the local base sample of individuals who were involved in alcohol abuse rehabilitation was composed of individuals who had been diagnosed by a medical officer as alcoholic but not considered to be at such a dysfunctional state as to merit referral to an Air Force ARC. In accordance with Air Force Regulation 160-36, efforts at alcohol abuse rehabilitation are to be attempted at the local level first. An additional part of the local base sample was composed of individuals who had been evaluated by a medical officer to be problem drinkers. These individuals were considered by the evaluator to have sufficient problems with alcohol abuse to merit rehabilitation at the local level, but not severe enough to merit a diagnosis of alcoholism.

The individuals who composed this sample were drawn from Eglin Air Force Base, Florida; Tyndall Air Force Base, Florida; and Moody Air Force Base, Georgia. These bases were selected because of their reasonable proximity to the researcher. Results of the 1979 Rand Study (Polich and Orvis) revealed minimal difference in the alcohol problem rate among the various Air Force Commands in the continental United States. In addition, "the difference between CONUS (continental United States) and Europe is small and not statistically significant (Chi Square test, $p>.05$)" (Polich and Orvis, 1979, p. 65).

Data from the local base alcohol abuse rehabilitation programs were collected during the Fall of 1985. The data collection procedure at each base was similar. Through the support of the Air Force Social Actions Office in Washington, D.C., arrangements were made with the Chief of Social Actions to give the research survey to active duty Air Force members currently in the active rehabilitation phase (as compared to the follow-up phase) of the local program. At each of the bases the research surveys were completed at the Social Actions office by the respondents during a group session set aside for this purpose.

A total of 66 completed survey forms was obtained from the local base alcohol abuse rehabilitation program (see Table 1).

Table 1
Distribution of Social Actions Respondents

	Evaluated Alcohol Use Category		
Base	Alcoholic	Problem Drinker	Total
Eglin AFB	25	11	36
Tyndall AFB	7	12	19
Moody AFB	0	11	11

Respondents, previously informed of their classification, indicated their status as diagnosed alcoholic or problem drinker so that two subgroups of assessment categories could be identified from the local base programs. As Table 1 indicates, no diagnosed alcoholic responses were obtained from the Moody Air Force Base sample. Discussion with the Moody Air Force Base rehabilitation personnel indicated that as a smaller base with fewer diagnosed alcoholics, diagnosed alcoholics at Moody Air Force Base were generally referred to an Air Force ARC.

A third sample of Air Force active duty individuals was drawn from the general base populations of the same three bases used for the sample of Social Action rehabilitants. The rationale for the representativeness of these bases was the same as the rationale stated for the representativeness of the selected Social Actions programs.

The procedure for administering the random survey was essentially the same at each base. Again through the support of the Air Force Social Actions Office in Washington, D.C. and subsequent support from the Tactical Air Command Social Actions Office (for Tyndall Air Force Base and Moody Air Force Base) and the Air Force Systems Command Social Actions Office (for Eglin Air Force Base) arrangements were made to conduct a random survey of active duty Air Force members.

Individuals were randomly selected through the base personnel roster using the same procedure the bases had been previously using to randomly select members for random drug screenings. Since officer and enlisted rosters were not combined, it was necessary to decide in advance the proportion of officers to be randomly selected. At each base it was determined that approximately 18% of the active duty personnel were officers. This proportion was used at each base for selecting the number of officers to be included in the sample. As a result, each sample included 54 officers and 246 enlisted personnel for a combined total of 300 surveys distributed at each base.

By Air Force regulation, participation in the survey was voluntary but methods were employed to try to enhance the response rate from the randomly surveyed individuals. Most of these methods were related primarily to the survey's lead letter and cover letter. In order to enhance the credibility of the survey, the letterhead for the local base was used for the lead letters and cover letters. In addition, a base command level signature was obtained to co-sign the lead letter and the cover letter with the researcher. Further efforts emphasizing the authority for the survey were made by indicating that the survey had been approved by the Air Force Manpower and Personnel Center, Randolph Air Force Base, Texas and had a specific Air Force

Survey Control Number. The content of the lead letters and cover letters emphasized the anonymity of the responses and the potential benefits for the Air Force from participation (see Appendix A).

At each base, sending out the lead letters through the base distribution system was followed two days later by distribution in the same manner of the research survey packages. Surveys were returned in the enclosed return envelopes to the local base Social Actions Office. This procedure was also accomplished through the base distribution system.

The Rand Corporation (Polich and Orvis, 1979), in their study of the Air Force in the late 1970s, found that getting completed responses from selected participants was restricted to a degree by participants either being on a temporary duty away from the base (TDY), on leave status, or on permanent change of station status (PCS). The Rand Study estimated that 15% (Polich and Orvis, 1979) of all potential respondents at any one time could be considered to be in one of these three statuses and therefore unable to respond to a survey. Polich and Orvis (1979) contended that these exclusions do hinder the ability to generalize "because everyone in the Air Force goes on leave or TDY from time to time, being absent for that reason is likely to be a random event and these omissions constitute random deletions from

the sampling frame" (p. 19).

Adjusting for the proportion of individuals in a status that would interfere with responding to a survey in the Air Force, the Rand Corporation obtained a 66% response rate for their mailed survey (Polich and Orvis, 1979). Making a similar adjustment, this research project obtained an overall 73.5% response rate (see Table 2).

Table 2

Random Sample Response Rate by Base

Base	Returned Surveys	Unadjusted Response Rate	Adjusted Response Rate
Eglin AFB	191	63.7%	74.9%
Tyndall AFB	192	64.0%	75.3%
Moody AFB	179	59.7%	70.2%

The option to return uncompleted research surveys was indicated on the cover letter. Uncompleted research surveys were returned to the local base Social Actions Offices. Notes on some of the packages confirmed that non-response was related to the selected individual being on either TDY,

PCS, or leave status. Other returned packages with an attached note indicated the possibility that the individual could have responded in the survey but chose not to respond.

Through various responses on the General Information Survey instrument of the instrument package, the individuals in this sample were divided into three groups:

1. Self report problem drinking individuals - general sample individuals not diagnosed by a medical officer as alcoholic or problem drinker who self reported alcohol consumption and an alcohol related incident (as described in the General Information Survey) within the past year.

2. Self report non-problem drinking individuals - general sample individuals not diagnosed by a medical officer as as alcoholic or problem drinker who self reported alcohol consumption but no alcohol related incidents (as described in the General Information Survey) within the past year.

3. Self report non-drinking individuals - general sample individuals not diagnosed by a medical officer as alcoholic or problem drinker who self report no history or alcohol consumption.

The total random survey was composed of 562 respondents (see Table 3).

Table 3

Distribution of Random Sample Respondents

Base	Alcohol Use Category		
	Problem Drinker	Non-Problem Drinker	Non-Drinker
Eglin AFB	17	160	14
Tyndall AFB	19	154	19
Moody AFB	16	140	23

Of the total number of random respondents, 52 were categorized as random sample problem drinkers, 454 were categorized as random sample non-problem drinkers, and 56 were categorized as random sample non-drinkers.

Instrumentation

> Theoretical models and their derivative constructs are invented to describe important personal phenomena that are of focal interest to mental health, psychopathology, and social problems. To test the utility of a given construct crude devices are often created to approximate the relative positions of individuals on that dimension, which is then used to predict behavior on some constructed criterion that bears analogy to a "real-life" relevant phenomenon. (Lefcourt, 1982, p. 128)

There is now a two decade history of examining the relationship between the locus of control construct and alcoholic populations (Rohsenow and O´Leary, 1978). As has been previously discussed, results of the research have been contradictory (Rohsenow and O´Leary, 1978). A control discrimination accuracy construct has been proposed in this research as a perspective that may be responsive to previous contradictory results as well as provide results with utility for intervention. As Lefcourt (1982) has stated, a subsequent step to developing a construct is the development of "crude devices ... to approximate the relative positions of individuals on that dimension" (p. 128). In order to address the development of a new device to measure the

control discrimination accuracy construct, previous key locus of control instruments were examined regarding the limitations of these instruments for examining control discrimination accuracy. Additionally, issues regarding effective measurement of constructs with individuals having a pattern of chronic alcohol abuse were examined in order to emphasize rationales involved in the construction of a control discrimination accuracy instrument.

Limitations of the "I-E Scale" for Control Discrimination Measurement

Rotter's (1966) I-E Scale or some variation of it has been the primary instrument for measuring the locus of control construct (Stafford, 1980; O'Brien, 1984). This frequent use has not equated with acceptance of application to all populations. In addressing the contradictory results derived from the I-E when used with alcoholic populations, Blij and Hinrichsen (1980) questioned the construct validity of Rotter's Locus of Control Scale in a population of alcoholics. Their data suggested that attempting to identify an alcoholic individual as internally or externally oriented is subject to "an unacceptably high error rate" (p. 474). O'Brien (1984) criticized Rotter's scale for not addressing a sufficient range of situations.

An additional criticism of the Rotter I-E with

conceptual significance regarding the control discrimination accuracy construct has been that the Rotter scale does not allow the identification of the realistic respondents (Wong & Sproule, 1984). The Rotter scale does not identify when an individual's external response may reflect an accurate control discrimination on the respondent's part of something which is not within his or her domain of control. It has been suggested that "moderate range scores" on Rotter's I-E Scale may conceptually represent individuals who are not extreme in perceived external or internal locus of control (O'Brien, 1984; Wong and Sproule, 1984). Since the score on the Rotter I-E is derived through summing the scores for each item, it is quite possible that moderate range scores reflect a blend of extreme external and internal responses rather than representing some idealized balance of control orientation that Wong (1984) referred to as "dual-dimensionality". A particular limitation for identifying accurate control discrimination through Rotter's I-E is that the items address individuals' perceptions of control and are not worded in such a manner to allow for categorization of responses into accurate and inaccurate control discriminations.

Utility of the Personal Orientation Inventory for Control Discrimination Accuracy Measurement

The examination of Rotter's scale indicated an improvement for measurement of a control discrimination accuracy construct would be to include items which allow for dichotomization between the individual's domains of what he or she can and cannot control. In 1964 Shostrom developed the Personal Orientation Inventory (POI). "The POI was developed to provide a standardized instrument for the measurement of values and behavior hypothesized to be of paramount importance in the development of the self-actualizing person" (Knapp, 1976, p.3). The concepts incorporated in the initial development of the POI were drawn from: Maslow's (1962, 1970) hypotheses about self-actualization; Riesman, Glazer, and Denney's (1950) system of inner- and other-directed; May, Angel, and Ellenberger's (1958), and Perls' (1947, 1951) conceptualizations of time orientation (Knapp, 1976, p.4).

In his final work, The Farther Reaches of Human Nature, Maslow (1971) wrote:

> In studying healthy people, self-actualizing people, etc., there has been a steady move from the openly normative and the frankly personal, step by step, toward more and more descriptive, objective words, to

> the point where there is today a standardized test of self-actualization. (p. 28)

Maslow was referring to the Personal Orientation Inventory (POI) developed by E. L. Shostrom (1964).

The POI consists of 150 two-choice items. Shostrom (1973, p.479) described the choices as "paired opposites" rather than as forced choices. Coan (1972), in The Seventh Mental Measurements Yearbook, stated "the use of double-statement items makes the test seem a little monotonous, but it often provides the subject with a more clearly delineated choice than he would otherwise have" (p.293). Responses are grouped into two major scales and ten subscales that are used in comparing the examinees' responses to normative samples. The two major scales are the (I) which measures "inner- versus other-directed" (Shostrom, 1976, p.33) and the (TC) which assesses "the degree to which one is reality oriented in the present and able to bring past experiences and future expectations into meaningful continuity" (Shostrom, 1976, p.33).

The conceptualizations of the (I) and (TC) scales are similar to conceptualization of the control discrimination accuracy construct. The concept of the (I) scale relates to the individual's discrimination of the locus for directing behavior (Shostrom, 1976, p.75). Wall (1975, p.282)

concluded that the POI is relatively independent of Rotter's concept of locus of control. His results showed (I) to internal control, r=.07.

The (TC) scale was designed to distinguish the individual who lives in the past -- with guilts, regrets, or resentments -- and/or in the future -- with idealized goals, plans, expectations, predictions, and fears -- from the person who lives more fully in the here and now (Shostrom, 1976, p.78). Coan (1972, p.294) stated the (TC) scale distinguishes the individual "overly preoccupied with either the past or the future" from the individual "living more fully in the here and now." The (TC) scale serves to measure one particular factor of an individual's discrimination between what he or she can and cannot change. The time frame over which the individual can have direct influence is the present. Neither the past nor the future are accessible to direct change and are therefore areas the individual cannot change. The (TC) scale provides a measurement of the individual's identification of the past and future as being unchangeable.

Research conducted by Zaccaria and Weir (1967) and Weir and Gade (1969) has shown results pointing to the (TC) scale as significantly lower for individuals in alcohol treatment programs as opposed to the normal adult standards of the POI. "Apparently, the alcoholic in particular is apt to be

the person dwelling on past or future events, lacking full awareness, contact, and feeling reactivity of the more time competent person" (Knapp, 1976, p.61). These results coincide with previously discussed theoretical perspectives of the curvilinear focus on extremes of individuals who have a behavior pattern of alcohol abuse. In this case, the focus is either on the past and/or the future, with a lesser focus on the area which is amenable to change -- the present.

Reliability and Validity of the POI

Since the development of the POI, it has been utilized and evaluated extensively. The Eighth Mental Measurements Yearbook by Buros (1978) listed over 600 citings of utilization or evaluation of the POI. Klavetter and Mogar (1967) conducted a test-retest reliability of the POI with a one week interval. "The major POI scales of (TC) and (I) displayed generally high reliability coefficients of .71 and .77" (p. 423). Wise and Davis (1975) conducted a readministration test of the POI using a two-week interval. Their results revealed test-retest coefficients of .75 for the (TC) scale and .88 for the (I) scale. Ilardi and May (1968) expanded the interval to one year. They contrasted the results of their study with those for other personality inventories administered to similar samples and time intervals. They concluded that the findings reported on the

POI were well within the ranges for comparable Minnesota Multiphasic Personality Inventory (MMPI) and Edwards Personal Preference Schedule (EPPS) test-retest reliability studies (Ilardi & May, 1968, p.71). McWilliams, Brown, and Minard (1975) working with an alcoholic sample reported a test-retest reliability coefficient of .74 on the POI.

Concurrent validity of the POI has been tested in varied situations. Fox, Knapp, and Micheal (1968) examined the ability of the POI to distinguish between a population of psychiatric in-patients and POI normal samples. "A population hospitalized for psychiatric impairment scored significantly lower in self-actualization than a relatively self-actualized group and a normal adult group" (p.567). A study (McLain, 1970) of correlation between staff evaluation of school counselors and results on the POI found nine of the scales (including the (TC) and the (I)) significantly correlated. Using a sample of convicted felons, Fisher and Silverstein (1969) found all means for the felons were lower than the POI norms and that the differences were significant for the (TC) and (I) scales.

"Internal Control Discrimination Accuracy" and "External Control Discrimination Accuracy" Subscales for the Personal Orientation Inventory

Even though there are conceptual similarities between

the (I) and (TC) scales of the POI and the control discrimination accuracy construct, actual measurement of control discrimination with the existing POI scales would be limited since the scales do not specifically discriminate between accurate control discriminations and inaccurate control discriminations. Some of the items on the POI do not lend themselves to a dichotomous discrimination between accurate and inaccurate control discrimination since they are not worded in terms that avail themselves to categorization of control discrimination through the Control Discrimination Accuracy Typology. For example, Item 6 provides a choice between:

a. I often make my decisions spontaneously.
b. I seldom make my decisions spontaneously.

Within the context of the Control Discrimination Accuracy Typology, neither choice offers a clear distinction regarding accurate or inaccurate control discrimination although choice "a" is scored as an "Inner" directed response on the (I) scale.

In comparison, many of the items on the POI scale are worded in terms to afford a dichotomization between accurate and inaccurate control discrimination. For example, Item 1 provides a choice between:

a. I am bound by the principle of fairness.

b. I am not absolutely bound by the principle of fairness.

Within the context of the Control Discrimination Accuracy Typology, response "a" represents an inaccurate control discrimination since it indicates a perception that the individual is unable to exercise a choice within his or her domain of control.

The "Internal Control Discrimination Accuracy" (ICDA) and "External Control Discrimination Accuracy" (ECDA) subscales for the POI were developed by the researcher to provide a scale for measuring control discrimination accuracy. These subscales were designed in consideration of recent statements in the research literature regarding the potential value of such scales. "'Realism' of control expectancies should be considered as a new outcome area" (Lefcourt, 1982, p. 183). According to Lefcourt (1982) no one has yet constructed devices that "ascertain control beliefs about events that are extremely improbable and commonly believed to be beyond control" (p. 183). O'Brien (1984) advocated for a scale to be developed which recognizes that both "internals and externals have distorted views of the nature of social reality" (p. 64).

Wong (1984) suggested that the most direct approach to identify "adaptive realists, who are neither overly

ambitious nor hopelessly passive," (p. 326) is to obtain measurements of perceived control for various situations and identify those who score high in both internal and external control. The ICDA and ECDA subscales were developed by identifying responses on the POI that could be dichotomized into accurate and inaccurate control discrimination. The inaccurate control discrimination responses reflected responses which revealed misperceptions of internal or external control.

The POI item examples previously discussed portray the method that was used to develop the ICDA and ECDA subscales for the POI. Each item was examined for the extent to which the choices presented a dichotomy in control discrimination terms. The ICDA was developed from items which appeared to address the internal domain of control. In these items the respondent was primarily presented with choices regarding the extent a choice within the individual's domain of control was exercised or not. The ICDA also included items which were considered to reflect the extent control's within the individual's domain of control were restricted beyond the individual's potential to exercise a choice.

The ECDA was developed from items which appeared to address the external domain of control. In these items the respondent was primarily presented with choices regarding the extent the individual attempted to exercise control over

some element in the external domain -- what others do, say, think, and feel.

It was proposed by the researcher that an overall measure of control discrimination accuracy could be developed by combining the respondent's ICDA and ECDA total scores. It was expected that the "Total Control Discrimination Accuracy" (TCDA) subscale would provide a measure for comparing overall control discrimination accuracy among individuals but would be restricted in identifying whether the misperception of control discrimination was primarily in the internal domain or the external domain. It was expected that the ICDA and ECDA would be better able to identify the specific domains of the misperception.

Of the 150 items on the POI, 71 items were identified as providing a dichotomy for a choice between accurate and inaccurate control discrimination. The initial list of items for the ICDA included 41 items. The initial list of items for the ECDA included 30 items. The relationship between the items on the ICDA and ECDA subscales and the (I) and (TC) scales of the POI are described in Table 4.

In order to address construct validity of the ICDA and ECDA subscales, additional pre-existing instruments were administered to the respondents. In addition to being

Table 4

Relationship Between the POI and CDA Scales

ICDA items scored the same as (I) items:	37
ECDA items scored the same as (I) items:	25
ICDA items scored opposite of (I) items:	1
ECDA items scored opposite of (I) items:	1
(I) items not included in CDA Scales:	63
Total (I) items:	127
ICDA items scored the same as (TC) items:	3
ECDA items scored the same as (TC) items:	4
ICDA items scored opposite of (TC) items:	0
ECDA items scored opposite of (TC) items:	0
(TC) items not included in CDA Scales:	16
Total (TC) items:	23

administered the Personal Orientation Inventory and General Information Survey, the ARC respondents and local Social Actions respondents were administered the Locus of Drinking Problem Scale (LODP) developed by Stafford (1980, 1982). The general base population samples were not administered the LODP since the instrument was not designed for application to a general sample (Stafford, 1982). The entire survey package can be found in Appendix B.

The LODP was designed to measure individuals' perceptions of the locus of their drinking problem with emphasis on perceptions of responsibility, control, blame, choice, and causality (Stafford, 1980). The 30-item scale had a reported alpha coefficient reliability of .78, Kuder-Richardson coefficient of reliability of .77, and a Spearman-Brown split-half reliability coefficient of .76. Validity investigation of the LODP had revealed the LODP scale could differentiate between alcoholics at different treatment facilities and between alcoholics with different characteristics (Stafford, 1980; Donovan and O'Leary, 1983).

It was expected that high "external" scores on the LODP would correlate with low levels of control discrimination accuracy on the ICDA and ECDA subscales. The extent to which actual measures reflected this expectation was used as a measure of construct validity.

The Trent Attribution Profile (TAP) was used as an additional tool to examine the construct validity of the ICDA and ECDA subscales. The TAP was developed in 1976 in response to limitations inherent in Rotter's I-E Scale (Wong and Sproule, 1984). The instrument was designed to directly measure individual's causal beliefs. In describing the TAP, the instrument developers stated:

> There are several advantages of using the TAP: 1) it provides separate measures of internality (ability and effort), externality (task difficulty and luck), stability (ability and task difficulty), and unstability (effort and luck); 2) it yields a profile of attribution ratings under four different conditions (self-success, other-success, self-failure, other failure); and 3) it allows a determination of attribution biases.

The instrument was designed as a matrix which examines individual's causal beliefs under four conditions: self-success, self-failure,other-success, other-failure. Each condition has items related to three different life domains: academic, social, and financial. The matrix between conditions and life domains resulted in a 12-item scale. Each item is followed by four possible explanations based on Weiner's (1971) four causal ascriptions: ability, effort, task difficulty, and luck. The respondent's

attributions to each causal possibility provided a profile of the individual's perspective of control with internal sources of attribution consisting of ability and effort and external consisting of task difficulty and luck (Weiner, Frieze, Kukla, Reed, Rest, and Rosenbaum, 1971; Wong, Watters, and Sproule, 1978).

The TAP has been found to have a test-retest reliability ranging from .57 to .74 (Wong et al., 1978). Criterion validity of the TAP has been reflected in finding the internality rating of the TAP significantly correlated with the Internality score of Rotter's "I-E Scale" (Pearson r=.51, $p<.001$). "The construct validity of the TAP was further enhanced by the findings of traditional attribution biases within the same subjects" (Wong, et al., 1980, p. 1133). Traditional attribution bias is the tendency for individuals to take greater personal credit for successes and attribute greater external credit for failure (Ross, 1977). These biases have been replicated in the TAP ($p<.01$).

The TAP was administered to all respondents in the research study. It was expected that emphasis on external sources of control score on the TAP would correlate negatively with high levels of control discrimination accuracy on the ICDA and ECDA subscales. The extent to which actual measures reflected this expectation was used as a measure of convergent construct validity.

The researcher proposed that a measure in addition to the Internal and External attribution scores could be obtained from the TAP. By subtracting an individual's total External attribution score from the total Internal attribution score the difference in emphasis placed by the individual on luck and task difficulty (External attributes) versus skill and effort (Internal attributes) could be examined. The researcher hypothesized that this gap would be greater for individuals who make more accurate discriminations between what is and is not within their control. A low gap between the Internal attribution and External attribution scores would indicate the individual made little discrimination between elements primarily in the internal domain of control (skill and effort) and elements not in the domain of control (luck and task difficulty).

This additional measure derived from the TAP was referred to as the individual's T-GAP score. It was expected that greater T-GAP scores would correlate positively with higher ICDA and ECDA scores. It was expected that individuals making attributions to outcome on elements more within their control than attributions to outcome on elements less in their control would primarily be the same individuals making accurate control discriminations.

CHAPTER V

MEASUREMENT CHARACTERISTIC FINDINGS FOR THE CONTROL DISCRIMINATION ACCURACY SCALES

Reliability and Validity of the Control Discrimination Accuracy Scales

In order to utilize the ICDA and ECDA scales for investigation of control discrimination accuracy differences among groups, it was necessary to first examine their reliability and validity. As Kerlinger (1973) has written: "Unless one can depend upon the results of measurement of one's variables, one cannot with any confidence determine the relations between variables" (p. 454).

Content Validity of the ICDA and ECDA Scales

Before examining the reliability of each of the control discrimination accuracy scales, the content validities of the ICDA and ECDA scales were examined. Nunnally (1978) has observed that a "detailed outline" (p. 93) is necessary for item selection. The outline developed for selecting the initial items for the ICDA and ECDA scales was previously discussed.

The initial method employed to evaluate the content

validity of the ICDA and ECDA scales was to compute item-total correlations for each of the scales. Item-total correlations for each scale were useful for examining the extent to which the individual item did correlate with the total scale score as well as examining the extent that the ICDA scale items were addressing an aspect of control discrimination that differed from the ECDA scale items. This distinction was necessary in order to assert that the scales were functioning as a measure of the specific domain of control (internal or external) that they were designed to assess. The initial item-total correlation results for ICDA and ECDA scales are found in Table 5.

Nunnally (1978) has estimated that up to 33% of the items will be deleted from the original list of items through an item-total correlation analysis. Using combined criteria of a minimal $\underline{r} = .20$ correlation (Nunnally, 1978) and a requirement that each item correlated more with the appropriate control discrimination category rather than the opposite control discrimination category, a total of 17 items were deleted from the original list of 71 items. This worked out to be a deletion rate of approximately 24%, well within Nunnally's (1978) estimate. To pursue further understanding of the control discrimination accuracy scales, content analysis of the 14 items deleted from the ICDA scale and the 3 items deleted from the ECDA scale was conducted

Table 5

Initial Item-Total Correlation Results for the ICDA and ECDA Scales

Internal Control Discrimination Accuracy			
POI Item	ICDA	ECDA	TCDA
1	.60	.14	.49
2	.48	.17	.42
3	.45	.01	.32
5	.49	.16	.43
8	.35	.14	.32
11	.48	.12	.39
12	.57	.10	.45
14	.43	.03	.32
15	.40	.18	.37
16	.21	.08	.19
18	.38	-.01	.26
21	.42	.23	.41
23	.57	.05	.43
28	.51	.23	.48
30	.19	.27	.27

Table 5 (continued)

POI Item	ICDA	ECDA	TCDA
31	.04	.27	.17
38	.06	.35	.14
41	.37	.25	.39
45	.45	.09	.36
46	.16	.09	.16
49	.22	.24	.28
57	.37	-.01	.26
58	.19	.29	.28
64	.39	.13	.34
66	.23	.07	.21
71	.26	.27	.32
72	.30	.21	.32
77	.31	-.01	.22
87	.26	.02	.19
91	.29	.17	.29
97	.20	.11	.20
109	.35	.02	.26
111	.33	.06	.26
112	.18	.27	.26
130	.46	.07	.36
131	.23	-.20	.06

Table 5 (continued)

POI Item	ICDA	ECDA	TCDA
134	.16	.36	.29
146	.17	.25	.25
148	.44	.08	.34
149	.25	.25	.30
150	.56	.10	.45

External Control Discrimination Accuracy

POI Item	ECDA	ICDA	TCDA
4	.34	.03	.19
7	.40	.04	.23
9	.25	.11	.20
19	.38	.09	.26
25	.41	.18	.34
26	.42	.15	.32
32	.35	.00	.28
33	.36	.09	.25
35	.04	.32	.24
48	.40	.17	.32

Table 5 (continued)

POI Item	ECDA	ICDA	TCDA
50	.48	.17	.36
52	.35	.26	.36
54	.45	.06	.27
55	.47	.11	.31
56	.37	.13	.28
59	.35	.22	.33
60	.38	.23	.36
61	.41	.15	.32
67	.32	.08	.22
68	.43	.10	.29
76	.21	-.01	.10
81	.33	.15	.28
85	.34	.04	.21
93	.34	.17	.29
101	.34	.13	.27
107	.30	.05	.29
117	.41	.14	.30
123	.37	.03	.21
125	.36	-.05	.25
142	.22	.05	.21

(see Appendix C).

After deleting 17 items from the initial 71, the item-total correlations for the ICDA and ECDA scales were recomputed. Corrected item-total correlations (Nunnally, 1978) were computed to adjust for the potential to have inflated correlations due to the item-self (Hudson, 1982) aspect of item-total correlations. The resulting correlations with the increased precision of computational adjustment revealed that all of the remaining 27 ICDA scale items and the remaining 27 ECDA scale items met the combined criteria of a minimal $r = .20$ correlation (Nunnally, 1978) and correlation with the appropriate control discrimination category rather than the opposite control discrimination category (see Table 6).

Factor Analysis of the ICDA and ECDA Scales

Factor analysis of the total set of selected control discrimination accuracy items was conducted to further examine the extent the ICDA and ECDA scale items function to address different aspects of control discrimination accuracy. The highest correlations of the items were distributed among four factors (see Table 7). All of the ICDA scale items had their highest loadings in either Factor 1 or Factor 3. All of the ECDA scale items had their highest loadings in either Factor 2 or Factor 4.

Table 6

Final Item-Total Correlation Results

for the ICDA and ECDA Scales With Item-Self Adjustments

Internal Control Discrimination Accuracy		
POI Item	ICDA	ECDA
1	.56	.09
2	.46	.12
3	.38	-.03
5	.49	.13
8	.28	.11
11	.57	.07
12	.53	.04
14	.43	-.02
15	.32	.14
18	.35	-.04
21	.32	.20
23	.62	.00
28	.47	.19
41	.30	.22
45	.44	.04

Table 6 (continued)

POI Item	ICDA	ECDA
57	.31	-.04
64	.34	.10
66	.27	.12
72	.28	.21
77	.21	-.02
87	.20	.00
91	.24	.14
109	.36	-.03
111	.26	.04
130	.36	.04
148	.36	.04
150	.58	.03

External Control Discrimination Accuracy

POI Item	ECDA	ICDA
4	.26	.00
7	.34	.00
9	.24	.08
19	.27	.10

Table 6 (continued)

POI Item	ECDA	ICDA
25	.34	.12
26	.33	.15
32	.32	-.07
33	.28	.06
48	.29	.15
50	.40	.11
54	.38	.01
55	.40	.05
56	.28	.09
59	.27	.17
60	.30	.20
61	.31	.12
67	.25	.01
68	.38	.05
81	.23	.14
85	.31	-.01
93	.27	.15
101	.26	.10
107	.21	-.01
117	.35	.09
123	.33	-.01

AD-A170 674 AN ANALYSIS OF THE RELATIONSHIP BETWEEN CONTROL DISCRIMINATION ACCURACY A.. (U) AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH R D NEWSOME AUG 86 2/3

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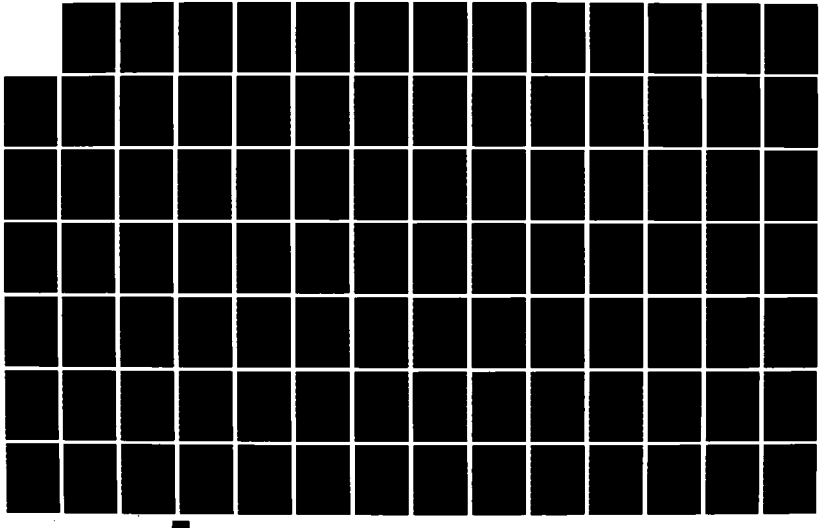


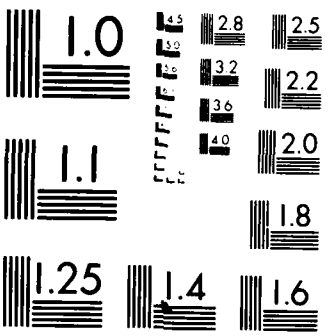


Table 6 (continued)

POI Item	ECDA	ICDA
125	.27	-.08
142	.32	.00

Table 7

Highest Loadings of Control Discrimination Accuracy Items Among Four Factors

Factor 1		
POI Item	CDA Scale	Loading
1	ICDA	.60
2	ICDA	.53
5	ICDA	.51
8	ICDA	.27
11	ICDA	.58
12	ICDA	.61
14	ICDA	.48
15	ICDA	.34
18	ICDA	.34
21	ICDA	.35
23	ICDA	.76
28	ICDA	.53
41	ICDA	.32
45	ICDA	.51
57	ICDA	.36

Table 7 (continued)

Factor 1		
POI Item	CDA Scale	Loading
64	ICDA	.34
66	ICDA	.20
72	ICDA	.25
87	ICDA	.19
91	ICDA	.20
109	ICDA	.53
130	ICDA	.28
150	ICDA	.62

Factor 2		
POI Item	CDA Scale	Loading
4	ECDA	.35
7	ECDA	.35
9	ECDA	.27
19	ECDA	.26
25	ECDA	.42

Table 7 (continued)

Factor 2		
POI Item	CDA Scale	Loading
26	ECDA	.29
32	ECDA	.57
33	ECDA	.23
50	ECDA	.31
54	ECDA	.37
55	ECDA	.41
56	ECDA	.18
59	ECDA	.30
60	ECDA	.28
68	ECDA	.19
101	ECDA	.20
117	ECDA	.32
123	ECDA	.34
125	ECDA	.25
142	ECDA	.28

Table 7 (continued)

Factor 3		
POI Item	CDA Scale	Loading
3	ICDA	.37
77	ICDA	.34
111	ICDA	.28
148	ICDA	.40

Factor 4		
POI Item	CDA Scale	Loading
48	ECDA	.19
61	ECDA	.31
67	ECDA	.53
81	ECDA	.29
85	ECDA	.27
93	ECDA	.21
107	ECDA	.35

Content analysis of the items with the highest loading in Factor 1 indicated that the factor was related to an internal control discrimination accuracy aspect of exercising or not exercising a choice within the internal domain of control. Content analysis of Factor 3, the other factor primarily related to the ICDA scale items, indicated that the factor was related to an internal control discrimination accuracy aspect of perfection in the individual's behavior by restricting or not restricting choices in the internal domain of control.

Content analysis of the items with the highest loading in Factor 2 indicated that the factor was related to an external control discrimination accuracy aspect of trying to control or not control the reactions of others. Content analysis of Factor 4, the other factor primarily related to ECDA scale items, indicated that the factor was related to an external control discrimination accuracy aspect of attempting to control or not control the feelings of others. The highest loaded items providing content analysis for each of the factors can be found in Appendix D.

Reliability of the CDA Scales

Once the items to be retained in the ICDA and ECDA scales had been determined, the reliability for each of the scales was computed. Cronbach's alpha formula (Nunnally,

1978) was utilized to compute reliability. The computed reliability for the ICDA scale was .84 with a sample size of 717. The computed reliability for the ECDA scale was .77 with a sample size of 717. The computed reliablity for the TCDA scale, the scale combining the ICDA and ECDA scale items, was .84 with a sample size of 717. The obtained reliabilities for the control discrimination accuracy scales compared favorably to a standard of .70 or higher for hypothesized measures of a construct (Nunnally, 1978, p. 245).

The four factors derived from the factor analysis of the control discrimination accuracy items were examined as independent scales to assess the potential contribution for increased precision in measuring control discrimination accuracy. The reliability for Factor 1 was .83, for Factor 2 it was .74, for Factor 3 it was .61, and for Factor 4 it was .44. This examination of the individual factors as potentially independent scales revealed that Factor 1 combined with Factor 3 as the ICDA scale and Factor 2 combined with Factor 4 as the ECDA scale functioned at a higher level of reliability than the individual factors as 4 independent scales. It was considered that this result reflected a concept that there are various aspects of internal and external control discrimination accuracy. In this study Factor 1 and Factor 3 reflected two aspects of

internal control discrimination accuracy. Factor 2 and Factor 4 reflected two aspects of external control discrimination accuracy. This finding of two central factors in the control discrimination accuracy items correlated well with a SCREE test (Cattell, 1966) factor analysis which also indicated two factors could be extracted from the control discrimination accuracy items (see Appendix E).

The standard error of measurement (SEM) was computed for each of the control discrimination scales to further examine their measurement characteristics. According to Hudson (1982), SEM addresses the potential shortcoming of reliablity coefficients for variation due to differences in the variance and standard deviation of a scale that may happen from one sample or population to the next. An advantage of the SEM is that its value is not influenced by these variations from one sample or population to the next (Helmstadter, 1964). Using the formula for computing SEM cited by Hudson (1982), the SEM for the ICDA was 8.4, for the ECDA it was 7.1, and for the TCDA it was 11.4. These values provide an estimate of the measurement error characteristics of the control discrimination accuracy scales. The importance of the magnitude of the SEMs is relative to the overall range of possible scores for the scale. The obtained SEMs for the control discrimination

accuracy scales represented less than 10% of the possible range for each of the scales.

Discriminant Validity of the CDA Scales

Once the error measurement characteristics and content validity of the control discrimination accuracy scales had been analyzed, the ICDA, ECDA, and TCDA scales were utilized to examine the ability of the scales to measure group differences in control discrimination accuracy. To be considered a valid measure of a construct which exists at different levels among individuals who consume alcohol, the control discrimination accuracy scales were expected to be capable of clearly distinguishing between two or more groups of persons who are known to have different levels of assessed problems with alcohol.

Two criterion groups representing different levels of assessed problems with alcohol were constructed. The 89 ARC respondents and the 32 local base rehabilitation respondents who had been diagnosed by a medical officer as alcoholic composed one criterion group. The other criterion group was composed of the 454 respondents in the random survey sample who reported alcohol consumption at least some time during the previous year and self-reported no history of any of the surveyed alcohol related incidents during the previous year.

To assess the discriminant validity of the control discrimination accuracy scales, one-way analyses of variance were conducted with the scale being evaluated treated as the dependent variable and membership in the criterion groups treated as the independent variable (see Table 8).

Table 8

Discriminant Validity Findings
For the Control Discrimination Accuracy Scales

Scale Name	Discriminant Validity	*F*-ratio	*p* Less Than
ICDA	.40	110.83	.0001
ECDA	.47	164.52	.0001
TCDA	.56	255.25	.0001

The findings shown in Table 8 reveal that the control discrimination accuracy scales fall within the validity standards of .40 to .60 described by Downie and Heath (1967). The superior discriminant validity of the TCDA scale suggests that combining the ICDA and the ECDA scales together does a better job of discriminating between individuals who have been diagnosed as alcoholic and

individuals who are considered to be non-problem drinkers than the individual scales alone.

At the item level, each item in the ICDA and ECDA scales was examined to see how well it made an accurate discrimination between the criterion groups (see Table 9). Every item in the ICDA and ECDA scales discriminated between the described criterion groups in the theoretically predicted direction of the non-problem drinker criterion group having a higher percentage of accurate control discrimination responses than the diagnosed as alcoholic criterion group.

Construct Validity of the CDA Scales

Campbell and Fiske (1959) referred to construct validity as the ability of a measure to correlate well with other variables that are theoretically related to the construct and correlate poorly with variables that are theoretically unrelated to the construct. Hudson (1982) discussed making predictions of strong or weak correlations between the construct of interest and other constructs as the hallmark of construct validity.

A priori hypotheses regarding relationships between control discrimination accuracy and other constructs were developed to examine the construct validity of the control discrimination accuracy scales. Utilizing a method

Table 9

Item Level Analysis of the

ICDA and ECDA Scales' Discriminant Validity

Internal Control Discrimination Accuracy Scale

POI Item	Alcoholic % Accurate (n=121)	Non-Problem Drinker % Accurate (n=454)
1	15%	47%
2	22%	43%
3	42%	61%
5	26%	54%
8	42%	68%
11	19%	49%
12	22%	39%
14	29%	51%
15	45%	58%
18	56%	65%
21	37%	60%
23	9%	45%
28	31%	55%
41	40%	64%
45	26%	41%

Table 9 (continued)

POI Item	Alcoholic % Accurate (n=121)	Non-Problem Drinker % Accurate (n=454)
57	26%	49%
64	40%	60%
66	53%	70%
72	51%	77%
77	59%	70%
87	40%	53%
91	53%	74%
109	17%	33%
111	60%	80%
130	46%	69%
148	45%	69%
150	15%	47%

External Control Discrimination Accuracy Scale

POI Item	Alcoholic % Accurate (n=121)	Non-Problem Drinker % Accurate (n=454)
4	64%	81%
7	70%	89%
9	65%	80%

Table 9 (continued)

POI Item	Alcoholic % Accurate (n=121)	Non-Problem Drinker % Accurate (n=454)
19	56%	76%
25	69%	89%
26	56%	78%
32	79%	94%
33	69%	84%
48	55%	75%
50	54%	78%
54	74%	86%
55	76%	90%
56	69%	85%
59	49%	77%
60	68%	84%
61	69%	81%
67	79%	90%
68	69%	87%
81	67%	83%
85	74%	92%
93	60%	76%
101	72%	84%
107	77%	89%
117	69%	87%

Table 9 (continued)

POI Item	Alcoholic % Accurate (n=121)	Non-Problem Drinker % Accurate (n=454)
123	69%	89%
125	40%	54%
142	36%	52%

developed by Campbell and Fiske (1959), predictions were made on three levels: 1) low correlation, 2) moderate correlation, and 3) high correlation. For all three of the control discrimination accuracy scales (ICDA, ECDA, and TCDA) it was predicted that the variables of sex, age, education, time in the Air Force, military rank, parental drinking pattern, and family size would have low correlations. These low level predictions were made because it was believed that variance in control discrimination accuracy would be spread all along the range of these variables.

For the ICDA scale it was predicted that external control discrimination accuracy and the frequency of alcohol consumption would have moderate correlations. For the ECDA scale it was predicted that internal control discrimination accuracy and the frequency of alcohol consumption would have moderate correlations. These moderate level predictions were made because it was believed that those who functioned at one level (well or poorly) with one domain of control (internal or external) would tend to function in a similar manner with the opposite domain of control. It was also believed that there would be some similarity in variance between control discrimination accuracy and frequency of alcohol consumption.

For the ICDA and ECDA scales it was expected that

higher correlations would be obtained between these scales and measures of similar constructs. It was expected that the ICDA and ECDA scales would have positive correlations with the Trent Internality scale since it emphasized attribution to outcome on areas generally within the individual's control. It was expected that the ICDA and ECDA scale would have negative correlations with the Trent Externality scale since it emphasized attribution to outcome on areas generally not within the individual's control. It was expected that the ICDA and ECDA scales would have positive correlations with the T-Gap score since it was intended as a measure of the difference in attribution to outcome the individual makes between areas generally within control and areas generally not within control. It was expected that the ICDA and ECDA scales would correlate negatively with the LODP scale since higher scores on the scale reflect a focus on external sources for control of behavior. It was expected that the ICDA and ECDA scales would correlate negatively with the number of alcohol related incidents experienced by the individual. Unlike frequency of alcohol consumption, it was expected that problems resulting from alcohol consumption would be more directly correlated with control discrimination accuracy. It was expected that the ICDA and ECDA scales would correlate positively with the (I) and (TC) scales of the POI (even after deletion of items in common) since both of the

scales had some conceptual similarities, as previously discussed, with the control discrimination accuracy scales.

Since some of the predictions were made without previous empirical support, it was fully expected that some of the specific predictions would fail. It was expected that, in general, the predictions would hold and that the average correlation between each of the control discrimination accuracy scales and each of the three classes of criterion variables would be strong enough to show the control discrimination accuracy scales were valid as a construct (see Table 10).Therefore the construct validity for each of the control discrimination accuracy scales was assessed by averaging each of the correlations found in the particular criterion class (see Table 10).

Table 10

Construct Validity for the CDA Scales

	Construct Criterion Class		
CDA Scale	Low	Moderate	High
ICDA	.10	.15	.31
ECDA	.09	.16	.42
TCDA	.12	.16	.35

The construct validity for each of the control discrimination accuracy scales was assessed by averaging each of the correlations found in the particular criterion class. The central finding revealed in Table 10 is that in all instances the low criterion class average was lower than the moderate and high criterion class' averages and that the moderate criterion class average was lower than the high criterion class average. This finding lends support to a claim of construct validity for a scale (Hudson, 1982). For comparison of the intervals between the criterion classes, using squared correlations provides a more accurate picture since correlations do not represent an equal-interval metric. The comparisons become clearer if this is done and the overall conclusion provides evidence to support a claim of good construct validity for the control discrimination accuracy scales.

Factorial Validity of the ICDA and ECDA Scales

The analysis of factorial validity is similar procedure to content and construct validity analyses. Factorial validity can be defined as a form of item analysis (Hudson, 1982). The item analysis conducted for examining the factorial validity of the ICDA and ECDA scales employed the multiple group method of factor analysis (Nunnally, 1978). This method involves computing Pearson product moment

correlations between the individual item on either the ICDA or the ECDA scale and the total score on a scale or level of a variable. These correlations are examined to see if the item correlates well with scale scores and variables it is expected to correlate with well and correlates poorly with scale scores and variables it is expected to correlate with poorly. The resulting correlations addressed the hypothesis that each item measures, in some way, control discrimination accuracy and not some other construct. To conduct the factorial validity analysis each of the items in the ICDA and ECDA scales was correlated with the appropriate scale's total score (using adjustment for item-self inflation), the total scores on the Trent Internality, Trent Externality, T-Gap, and LODP scales; and the respondent's sex, age, and number of years of school completed (see Table 11 and Table 12).

Examination of the factorial validity correlations for the ICDA and the ECDA scales indicated that all of the control discrimination accuracy items had higher correlations with the appropriate control discrimination accuracy scale total score than with any of the other seven measures. This examination suggested that the ICDA and ECDA scales have adequate factorial validity since the items have higher correlations with the appropriate control discrimination accuracy scale total score than with any of

Table 11

ICDA Scale Factorial Validity Data

POI Item	ICDA	TI	TE	TGAP	LODP	SEX	AGE	SCH
1	.56	.12	-.09	.14	.05	.07	.03	.12
2	.46	.02	-.10	.08	.04	.04	.10	.04
3	.38	.04	.07	-.02	.08	.04	-.02	-.01
5	.49	.04	-.04	.05	.11	.06	.15	.12
8	.28	.01	-.08	.06	.15	.11	.03	.05
11	.57	.07	-.11	.11	.01	.10	.12	.04
12	.53	-.03	.01	-.02	.11	.01	.09	.07
14	.43	.10	-.06	.10	.02	.10	.08	.05
15	.32	.05	-.01	.04	.17	.05	-.01	.03
18	.35	.08	.01	.04	.11	-.02	.05	.03
21	.32	.05	-.08	.08	-.01	.02	.07	.10
23	.62	.02	-.11	.08	-.06	.06	.07	.08
28	.47	.01	-.09	.06	-.02	.11	.13	.10
41	.30	.05	-.07	.08	-.13	.03	.09	.05
45	.44	-.04	.00	-.03	.05	.11	-.02	.01
57	.31	-.01	-.03	.01	-.03	.05	-.05	.01
64	.34	-.01	-.07	.04	-.06	.10	.02	.05
66	.27	.09	-.09	.11	.01	.10	.09	.08

Table 11 (continued)

POI Item	ICDA	TI	TE	TGAP	LODP	SEX	AGE	SCH
66	.27	.09	-.09	.11	.01	.10	.09	.08
72	.28	.12	-.06	.12	.19	.10	.04	.05
77	.21	.07	.02	.03	.10	.05	-.04	-.05
87	.20	-.06	-.07	.01	.05	.04	.03	.11
91	.24	.01	-.05	.04	.15	.11	.11	.11
109	.36	-.01	-.04	.02	-.07	-.01	.07	.08
111	.26	-.04	.00	-.02	.18	.05	.09	.08
130	.36	.07	.03	.06	.19	.02	.02	.00
148	.36	.06	-.01	.05	-.03	.10	.05	.05
150	.58	.12	-.09	.14	.07	.08	.13	.09

Table 12

ECDA Scale Factorial Validity Data

POI Item	ECDA	TI	TE	TGAP	LODP	SEX	AGE	SCH
4	.26	.10	-.12	.16	-.16	-.13	.05	.06
7	.34	.01	-.10	.13	-.02	.08	.05	.05
9	.24	.16	-.13	.17	.01	-.03	-.07	.04
19	.27	.04	-.11	.10	.05	-.07	.10	.11
25	.34	.12	-.09	.13	-.01	.00	.01	.04
26	.33	.12	-.13	.16	-.12	-.02	.09	-.02
32	.32	.21	-.18	.25	-.12	-.06	.03	.04
33	.28	.10	-.05	.09	-.04	-.05	.06	.05
48	.29	.03	-.06	.06	-.05	.00	.04	.05
50	.40	.07	-.09	.10	-.24	-.03	.05	.08
54	.38	.10	-.11	.14	.04	.08	.09	.10
55	.40	.12	-.12	.15	-.02	.03	.06	.03
56	.28	.12	-.09	.13	.05	.01	.08	.04
59	.27	.15	-.13	.18	-.10	.10	.02	.03
60	.30	.08	-.08	.10	-.03	-.02	.05	.03
61	.31	.08	-.12	.13	.05	.03	.07	.06
67	.25	.09	-.05	.09	-.09	.02	.01	.05
68	.38	.05	-.08	.08	-.08	.00	.08	.10

Table 12 (continued)

POI Item	ECDA	TI	TE	TGAP	LODP	SEX	AGE	SCH
68	.38	.05	-.08	.08	-.08	.00	.08	.10
81	.23	.13	-.02	.09	.14	.01	.06	.04
85	.31	.07	-.08	.09	-.11	.02	.08	.08
93	.27	.01	.00	.00	.13	.02	-.12	-.08
101	.26	.06	-.07	.09	-.02	-.03	.06	-.02
107	.21	.08	-.07	.09	.06	.00	.06	.06
117	.35	.17	-.13	.19	-.06	.02	.06	.03
123	.33	.12	-.10	.14	-.04	-.05	.02	.04
125	.27	.00	.00	.00	-.04	-.03	.04	.03
142	.32	.12	-.13	.16	-.13	.01	.03	.06

the other measures shown in Table 11 and Table 12.

Nunnally (1978) has written that validation is an "unending process" (p. 87) in the sense that validity of a measure is never established but rather a matter of degree with the potential for improvement always present. Keeping this caveat in mind, the mutual support provided through a combination of adequate content, discriminant, construct, and factorial validity for the control discrimination accuracy scales indicated that the researcher could confidently use the scales to examine the relationship between control discrimination accuracy and alcohol abuse in the United States Air Force.

The Development of Cutting Scores for the Control Discrimination Accuracy Scales

Cutting scores for the control discrimination accuracy scales were developed as a means to investigate the scales' potential ability to function as a tool for making assessments of individuals' control discrimination ability and type. The methodology for developing the cutting scores for the control discrimination accuracy scales employed the known groups method of concurrent criterion validity (Kerlinger, 1973; Hudson, 1982). Individuals who had been previously classified as either alcoholic or as random non-problem drinkers composed the known groups. Each of

these individuals had completed the Personal Orientation Inventory as a part of the research survey. Their total scores for the control discrimination accuracy scales were computed from their responses on the relevant items in the POI. A separate cumulative frequency distribution for the individual scale scores (ICDA, ECDA, and TCDA) were prepared for the two criterion groups. The two cumulative frequencies corresponding to the appropriate control discrimination accuracy scale were then used to locate the particular scale score which, if used as a cutting score, would minimize the sum of the false positives and the false negatives. That score was then evaluated as a possible cutting score.

Several trials were conducted to consider the format for calculating the scale scores. With the ICDA and ECDA scales containing 27 items each, it was decided that a range of possible scores from 0 to 100 would provide a scoring format that would be more conventional than a range of 0 to 27 which would result from using the raw score for each scale. Data transformation of each respondent's ICDA and ECDA scale score was conducted by multiplying each ICDA and ECDA scale raw score by 3.703703. Multiplying each raw score by this constant created the possibility for an ICDA or ECDA scale total score range of C to 100.

The cumulative frequencies on the ICDA, ECDA, and TCDA

scales for each of the criterion groups were first examined using the actual proportion of each of the two groups: 121 individuals who had been diagnosed as alcoholic and 454 individuals who had been classified as non-problem drinkers. This method was unsuccessful for developing a functional cutting score since the unequal proportion between the groups resulted in very high false negative rates due to the larger number of individuals in the non-problem drinker criterion group. Development of functional cutting scores were recomputed by assuming that the criterion groups existed at equal proportions. This approach erased the effect on false negatives that had been created by the initial unequal proportion between the criterion groups.

Adjustment of the proportions of the criterion groups was made with awareness of the potential effect such an adjustment could have on the scales' actual rates of accurate classifications. Megargee (1982) has stated that employing distributions of the problem and non-problem groups for the development of a scale which do not reflect the general population can result in an exceedingly high frequency of false positives. Examination of all the developed cutting scores in this research included examination of the potential for false positive rates that would limit the utility of the scales when applied to

situations where the actual proportions of the criterion groups more accurately reflected the actual proportion. The National Institute of Alcoholism and Alcohol Abuse (NIAAA) estimate of a 15% rate for alcoholism (1981) was employed for this purpose.

With equally proportioned criterion groups, the developed cutting score for the ICDA scale was 41 with a possible range of 0 to 100. The resulting false negative rate (classifying an individual in the diagnosed as alcoholic criterion group as not having problems with internal control discrimination accuracy) was 29%. The resulting false positive rate (classifying an individual in the assessed as a non-problem drinker criterion group as having problems with internal control discrimination accuracy) was also 29%. Table 13 provides data indicating the distribution of the criterion groups using: 1) equally proportioned groups and 2) the actual proportion of the research sample.

In addition, Table 13 also portrays a hypothetical screening sample of 10,000 individuals. Utilizing an alcoholism rate of 15%, the hypothetical screening sample was examined by applying the false negative and false positive rates that had been obtained in the development of the cutting score. This procedure was performed to examine the effect an equal proportion distribution for the

Table 13

Classification Rates of the ICDA Scale

Equal Proportion Condition

	Criterion: Alcoholic	Criterion: Non-Problem Drinker	Total
ICDA: Accurate	132 (29%)	321 (71%)	453
ICDA: Inaccurate	322 (71%)	133 (29%)	455
	454	454	908

No. of Correct Classifications (Hit Rate)= 643 (71%)

No. of Incorrect Classifications (Miss Rate)= 265 (29%)

Table 13 (continued)

Actual Proportion of the Research Sample

	Criterion		
	Alcoholic	Non-Problem Drinker	Total
ICDA			
Accurate	35 (29%)	321 (71%)	356
Inaccurate	86 (71%)	133 (29%)	219
	121	454	575

No. of Correct Classifications (Hit Rate)= 407 (71%)

No. of Incorrect Classifications (Miss Rate)= 168 (29%)

Table 13 (continued)

Hypothetical Screening Sample of 10,000 Individuals With an Estimated 15% Rate of Alcoholism

	Criterion		
	Alcoholic	Non-Problem Drinker	Total
ICDA Accurate	435 (29%)	6885 (71%)	7320
ICDA Inaccurate	1065 (71%)	1615 (29%)	2680
	1500	8500	10000

No. of Correct Classifications (Hit Rate)= 7950 (79.5%)

No. of Incorrect Classifications (Miss Rate)= 2050 (20.5%)

development of the cutting score would have on screening a population with a proportion more reflective of the actual distribution of individuals with alcoholism in the population.

The ICDA scale achieved a correct classification rate ranging from 71% to 79.5% depending on the proportional mix of the sample. If accurate control discrimination was used as an exclusive category for discriminating between individuals with alcoholism and random non-problem drinkers, the hypothetical 10,000 individuals sample indicated that the number of correctly identified individuals with alcoholism (1065) was exceeded by the number of non-problem drinkers incorrectly identified as individuals with alcoholism (1615).

With equally proportioned criterion groups, the developed cutting score for the ECDA scale was 78 with a possible range of 0 to 100. The resulting false negative rate was 25.5%. The resulting false positive rate was 31%. Table 14 provides data indicating the distribution of the criterion groups using: 1) equally proportion groups and 2) the actual proportion of the research study sample, and 3) a hypothetical screening sample of 10,000 individuals utilizing an alcoholism rate of 15%.

The ECDA scale achieved a correct classification rate

Table 14

Classification Rates of the ECDA Scale

Equal Proportion Condition

	Criterion: Alcoholic	Criterion: Non-Problem Drinker	Total
ECDA: Accurate	113 (25%)	312 (69%)	425
ECDA: Inaccurate	341 (75%)	142 (31%)	483
	454	454	908

No. of Correct Classifications (Hit Rate)= 653 (72%)

No. of Incorrect Classifications (Miss Rate)= 255 (28%)

Table 14 (continued)

Actual Proportion of the Research Study Sample

	Criterion		
	Alcoholic	Non-Problem Drinker	Total
ECDA Accurate	30 (25%)	312 (69%)	342
ECDA Inaccurate	91 (75%)	142 (31%)	233
	121	454	575

No. of Correct Classifications (Hit Rate)= 403 (70%)

No. of Incorrect Classifications (Miss Rate)= 172 (30%)

Table 14 (continued)

Hypothetical Screening Sample of 10,000 Individuals With an Estimated 15% Rate of Alcoholism

	Criterion		
	Alcoholic	Non-Problem Drinker	Total
ECDA Accurate	382 (29%)	5865 (71%)	6247
ECDA Inaccurate	1118 (71%)	2635 (29%)	3753
	1500	8500	10000

No. of Correct Classifications (Hit Rate)= 6983 (70%)

No. of Incorrect Classifications (Miss Rate)= 3017 (30%)

ranging from 70% to 72% depending on the proportional mix of the sample. If accurate control discrimination was used as an exclusive category for discriminating between individuals with alcoholism and random non-problem drinkers, the hypothetical 10,000 individuals sample indicated that the number of correctly identified individuals with alcoholism (1118) was exceeded by the number of non-problem drinkers incorrectly identified as individuals with alcoholism (2635).

With equally proportioned criterion groups, the developed cutting score for the TCDA scale was 115 with a possible range of 0 to 200. The resulting false negative rate was 10.8%. The resulting false positive rate was 24%. Table 15 provides data indicating the distribution of the criterion groups using: 1) equally proportion groups and 2) the actual proportion of the research study sample, and 3) a hypothetical screening sample of 10,000 individuals utilizing an alcoholism rate of 15%.

The TCDA scale achieved a correct classification rate ranging from 81% to 82% depending on the proportional mix of the sample. If accurate control discrimination was used as an exclusive category for discriminating between individuals with alcoholism and random non-problem drinkers, the hypothetical 10,000 individuals sample indicated that the number of correctly identified individuals with alcoholism

Table 15

Classification Rates of the TCDA Scale

Equal Proportion Condition

	Criterion: Alcoholic	Criterion: Non-Problem Drinker	Total
TCDA: Accurate	97 (21%)	375 (83%)	472
TCDA: Inaccurate	357 (79%)	79 (17%)	436
	454	454	908

No. of Correct Classifications (Hit Rate)= 732 (81%)

No. of Incorrect Classifications (Miss Rate)= 176 (19%)

Table 15 (continued)

Actual Proportion of the Research Study Sample

	Criterion		
	Alcoholic	Non-Problem Drinker	Total
TCDA Accurate	26 (21%)	375 (83%)	401
TCDA Inaccurate	95 (79%)	79 (17%)	174
	121	454	575

No. of Correct Classifications (Hit Rate)= 470 (82%)

No. of Incorrect Classifications (Miss Rate)= 105 (18%)

Table 15 (continued)

Hypothetical Screening Sample of 10,000 Individuals With an Estimated 15% Rate of Alcoholism

	Criterion		
	Alcoholic	Non-Problem Drinker	Total
TCDA Accurate	351 (29%)	7055 (71%)	7406
TCDA Inaccurate	1149 (71%)	1445 (29%)	2594
	1500	8500	10000

No. of Correct Classifications (Hit Rate)= 8204 (82%)

No. of Incorrect Classifications (Miss Rate)= 1796 (18%)

(1149) was exceeded by the number of non-problem drinkers incorrectly identified as individuals with alcoholism (1445).

Comparison between the control discrimination scales indicated that combining the ICDA and ECDA scales to form the TCDA scale was a superior method to using either the ICDA scale or the ECDA scale independently. This result is understandable since meeting the cutting score for the TCDA scale is a more severe test than meeting the cutting score for either the ICDA or ECDA scales independently. In order to meet the cutting score of the TCDA scale it would be unlikely for the individual to have performed poorly on either the ICDA or ECDA scale. This would not have been the case with the individual ICDA and ECDA scales since it would have been possible to score well above the ICDA scale cutting score, therefore indicate generally accurate internal control discrimination, and score quite low on the ECDA scale, therefore indicating generally inaccurate external control discrimination. The reverse combination would have been possible as well. The improved classification ability of the TCDA scale reflected its potential for measurement of overall ability regarding control discrimination accuracy.

Even though each of the scales functioned to discriminate between individuals with alcoholism and

non-problem drinkers, it was apparent that the obtained false positive rates were susceptible to the risk identified by Megargee (1982) in using scales with higher false positive rates as a screening instrument. In all three of the hypothetical screening examples, the number of accurately classified individuals with alcoholism was exceeded by the number of non-problem drinkers who would have been classified as alcoholic if control discrimination accuracy was used as the only assessment criteria. The higher false positive rates were expected since it had not been theorized that almost all non-problem drinkers would make accurate control discriminations. Instead, it was theorized that individuals who had been diagnosed as alcoholic would tend to be individuals who generally have problems with control discrimination accuracy.

To address this issue, the researcher examined to what extent CDA-Type might obtain lower false negative and false positive rates and function as a better discriminator between individuals with alcoholism and non-problem drinkers. The CDA-Types were operationalized by using individual's adjusted raw scores (ranging from 0 to 100) on the ICDA and ECDA scales. CDA-Type 1 (theoretically the accurate control discriminators) was operationalized as those individuals scoring above both the ICDA and ECDA cutting scores.

CDA-Type 2 (theoretically the internal locus of controllers) was operationalized as individuals scoring above the ICDA scale cutting score in addition to scoring at or below the ECDA scale cutting score. The rationale for this operationalization was that theoretically CDA-Type 2 individuals make accurate internal control discriminations but inaccurate external control discriminations through belief in being able to control what others do, say, think, and feel.

CDA-Type 3 (theoretically the external locus of controllers) was operationalized as individuals scoring above the ECDA scale cutting score in addition to scoring at or below the ICDA scale cutting score. The rationale for this operationalization was that theoretically CDA-Type 3 individuals make accurate external control discriminations but inaccurate internal control discriminations through belief in not being the ultimate controller over what they do, say, think, and feel.

CDA-Type 4 (theoretically the reverse of accurate control discriminators) was operationalized as individuals scoring at or below both the ICDA scale cutting score and the ECDA scale cutting score. The rationale for this operationalization was that theoretically CDA-Type 4 individuals make inaccurate internal and external control discriminations by believing they can control what others

do, say, think, and feel; and at the same time, believe that others control what they do, say, think, and feel.

The ability to make classifications with CDA-Type was examined in a manner similar to the examination of the classification ability of the control discrimination accuracy scales. It was expected that the greatest discrimination between the criterion groups would be found by contrasting CDA-Type 1 and CDA-Type 4 individuals. This expectation was based on a theoretical perspective that CDA-Type 1 individuals would be less likely to be the individuals who had been diagnosed as alcoholic. To the extent that control discrimination accuracy plays a role in development of a drinking pattern diagnosed as alcoholism, it would be unlikely that those individuals classified as generally making accurate control discriminations would be the same individuals who had been diagnosed as alcoholic.

Focus on the CDA-Type 1 individuals revealed that 3.3% (n = 4) of the individuals diagnosed as alcoholic fit the operational definition of CDA-Type 1 as compared to 49.8% (n = 226) of the non-problem drinkers. An inverse result of similar proportions was found for CDA-Type 4 individuals with 49.6% (n = 60) of the individuals diagnosed as alcoholic fitting the operational definition of CDA-Type 4 as compared to 10.4% (n = 47) of the non-problem drinkers (see Table 16).

Table 16

Classification Rates By CDA-Type Using Research Sample

Research Sample Results

CDA-Type	Criterion: Alcoholic	Criterion: Non-Problem Drinker	Total
CDA-Type 1	4 (3%)	226 (50%)	230
CDA-Type 2	31 (26%)	95 (21%)	126
CDA-Type 3	26 (21%)	86 (19%)	112
CDA-Type 4	60 (50%)	47 (10%)	107
	121	454	575

No. of Correct Classifications for CDA-Type 1 and CDA-Type 4 Only (Hit Rate)= 286 (85%)

No. of Incorrect Classifications for CDA-Type 1 and CDA-Type 4 Only (Miss Rate)= 105 (15%)

As revealed by Table 16, the potential for CDA-Type 2 and CDA-Type 3 to discriminate between individuals diagnosed as alcoholic and non-problem drinkers was minimal. This result provides additional support for CDA-Type 1 and CDA-Type 4 being viewed as the control discrimination accuracy types with potential utility for screening purposes. If an assumption for screening purposes was made that CDA-Type 1 individuals were at low risk for an alcoholic drinking pattern and CDA-Type 4 individuals were at high risk for an alcoholic drinking pattern, a hypothetical screening sample would have results similar to those portrayed in Table 17. This table was developed by applying the proportionate distributions of the CDA-Type found in the sample criterion groups to a hypothetical distribution employing a 15% rate of alcoholism within the hypothetical sample.

Since CDA-Type 2 and CDA-Type 3 did not function to discriminate between the criterion groups they were omitted for interpreting the potential false negative and false positive rates that might result in the hypothetical screening. Instead of trying to categorize individuals whose scores were operationalized as CDA-Type 2 or CDA-Type 3, these individuals would be classified as "unable to categorize." In the hypothetical example this would be approximately 40.9% of the sample. From the remaining 59.1%

Table 17

Classification Rates By CDA-Type Using Hypothetical Sample

Hypothetical Screening Sample of 10,000 Individuals
With an Estimated 15% Rate of Alcoholism

CDA-Type	Criterion: Alcoholic	Criterion: Non-Problem Drinker	Total
CDA-Type 1	49 (3%)	4233 (50%)	4282
CDA-Type 2	384 (26%)	1777 (21%)	2161
CDA-Type 3	322 (21%)	1607 (19%)	1929
CDA-Type 4	744 (50%)	884 (10%)	1628
	1500	8500	10000

No. of Correct Classifications for CDA-Type 1 and CDA-Type 4 Only (Hit Rate)= 4977 (84%)

No. of Incorrect Classifications for CDA-Type 1 and CDA-Type 4 Only (Miss Rate)= 933 (16%)

(n = 5910) of the hypothetical sample categorized as CDA-Type 1 or CDA-Type 4, 84% would be accurately placed in the high risk or low risk for alcoholism categories. The false negative rate of classifying an individual with alcoholism as having a low risk for alcoholism would be only .8%. This small false negative rate was computed by dividing the proportionate representation of individuals with alcoholism classified as CDA-Type 1 (49 in a hypothetical sample of 10,000) by the number of individuals for whom a classification decision would be made (n = 5910, the number of individuals classified as CDA-Type 1 or CDA-Type 4 in the hypothetical sample). The false positive rate of classifying a non-problem drinker as having a high risk for alcoholism would be 15%. This rate was computed in the same manner that the false negative rate was computed.

Summing the results of the hypothetical screen using CDA-Type indicates that nearly 60% of the time a decision could be made regarding a prediction of high risk or low risk for alcoholism. It would be expected that these predictions would be accurate at a rate of approximately 84%. The risk for making an inaccurate classification of an individual with alcoholism would be quite small, an inaccuracy rate of .8%. The risk for making an inaccurate classification of a non-problem drinker would be approximately 15%. Comparing these results to those obtained

by using the adjusted raw scores on the TCDA scale, it becomes apparent that CDA-Type can function as an improved screening approach to the raw scores of the control discrimination accuracy scales. The major improvement lies in the reduction in the false negative rate, the risk of making an inaccurate classification of an individual with alcoholism. The false positive rate is reduced from 24% to 15%. The accuracy rates for the two approaches are quite similar, 84% for the CDA-Type approach and 82% for the TCDA scale approach.

One additional comparison between the TCDA scale approach and the CDA-Type approach was made by examining the individuals who had been classified from the random sample as problem drinkers by their self report of having experienced at least one of the listed alcohol related incidents within the past year. This group of individuals could be perceived as a sample of individuals who might be referred to a substance abuse program for evaluation of their drinking behavior. During this evaluation the control discrimination accuracy scales could be administered. Examining these individuals' results on the control discrimination accuracy scales provides some information on how the two approaches to using the scales might function as a screening tool in a substance abuse program. If the scales were to be considered as useful instruments, it would

certainly be expected that the control discrimination accuracy scales would perform a discriminate function with these individuals.

The TCDA scale approach resulted in classifying 71% (37 of 52 individuals) of the random problem drinkers sample as having problems with control discrimination accuracy and therefore, theoretically at risk for alcoholism. The CDA-Type approach resulted in classifying 2 of the individuals as CDA-Type 1, 14 of the individuals as CDA-Type 2, 11 of the individuals as CDA-Type 3, and 25 of the individuals as CDA-Type 4. Employing the same analysis procedure as that previously employed with the CDA-Type examination of the hypothetical 10,000 sample, 48% of the random sample problem drinkers would not be classified due to their CDA-Type 2 or CDA-Type 3 status. From the remaining 52% of the random sample problem drinkers, 93% (n = 25) of these (the CDA-Type 1 individuals) would be classified as being at a high risk for alcoholism and 7% (n = 2) of these (the CDA-Type 1 individuals) would be classified as being at a low risk for alcoholism. Similar to their functioning for discrimination between individuals diagnosed as alcoholic and non-problem drinkers, both approaches performed in a manner to identify individuals who are at a higher probability for problems with alcohol as individuals who generally have problems with control

CHAPTER VI

TESTING OF THE RESEARCH HYPOTHESES

Testing of Hypothesis One

Hypothesis One was related to testing whether the individuals admitted to an Air Force ARC have greater problems with control discrimination accuracy than a general sample of Air Force active duty individuals. With the positive indication of acceptable reliability and validity for the control discrimination accuracy scales, comparison of the groups identified in Hypothesis One was performed by using the developed scales.

The group means from each base were compared before comparing the groups means as an aggregate. This procedure was carried out to assure that combining the group means from the three sampled bases could be justified. Three group means of control discrimination accuracy scores were developed for each base. The group means from each base indicated the mean scores for the random sample groups classified as problems drinkers, classified as non-problem drinkers, and classified as non-drinkers (see Table 18). Scheffe's test of a posteriori contrasts indicated that only the mean scores on the ECDA scale for the random non-problem

discrimination accuracy.

The major trade off between the two approaches is the loss in classifying all individuals achieved with the TCDA scale approach as compared to the increased precision in classification achieved by the CDA-Type approach. As newly developed instruments, any consideration for employing the control discrimination accuracy scales as screening instruments for assessments of the individual's risk status for having problems with alcohol should use a conservative approach that minimizes false positive and false negative assessments even with the result of narrowing the scope of assessments. The CDA-Type approach would, therefore, appear to be the appropriate choice if the control discrimination accuracy scales were employed as a screening tool. Obviously, their actual employment should be accompanied by additional assessment methods including behavioral and clinical assessments and never used as the sole means for making an assessment of an individual's risk status for having problems with alcohol.

Table 18

Examination of Random Sample Group Means' Homogeneity Across Sampled Bases

Random Problem Drinker Group					
Internal Control Discrimination Accuracy					
Base	N	Range	Median	Mean	Standard Deviation
Eglin	17	11-63	31.0	34.6	13.0
Moody	16	30-59	41.1	42.6	8.8
Tyndall	19	11-56	34.3	33.1	13.7
External Control Discrimination Accuracy					
Base	N	Range	Median	Mean	Standard Deviation
Eglin	17	44-100	76.9	76.3	16.2
Moody	16	37-78	59.6	59.0	12.3
Tyndall	19	22-93	66.7	66.3	19.4

Table 18 (continued)

Total Control Discrimination Accuracy					
Base	N	Range	Median	Mean	Standard Deviation
Eglin	17	74-156	111.1	110.9	20.1
Moody	16	67-130	101.9	101.6	15.9
Tyndall	19	59-130	96.3	99.4	20.7
Random Non-Problem Drinker Group					
Internal Control Discrimination Accuracy					
Base	N	Range	Median	Mean	Standard Deviation
Eglin	160	22-96	53.0	57.1	19.7
Moody	140	11-96	53.7	55.5	20.9
Tyndall	154	15-100	50.4	58.1	22.0

Table 18 (continued)

External Control Discrimination Accuracy					
Base	N	Range	Median	Mean	Standard Deviation
Eglin	160	44-100	86.6	85.5	10.2
Moody	140	37-100	80.7	79.7	13.4
Tyndall	154	48-100	86.5	84.3	11.1

Total Control Discrimination Accuracy					
Base	N	Range	Median	Mean	Standard Deviation
Eglin	160	96-189	140.4	142.6	22.8
Moody	140	63-181	139.9	135.2	22.5
Tyndall	154	74-196	138.5	142.3	26.7

Table 18 (continued)

Random Non-Drinker Group

Internal Control Discrimination Accuracy

Base	N	Range	Median	Mean	Standard Deviation
Eglin	14	19-96	83.3	67.5	29.3
Moody	23	15-89	49.1	52.7	21.3
Tyndall	19	15-93	38.3	45.4	23.6

External Control Discrimination Accuracy

Base	N	Range	Median	Mean	Standard Deviation
Eglin	14	52-96	83.3	81.5	13.2
Moody	23	56-96	79.3	80.0	13.1
Tyndall	19	52-100	87.7	84.6	12.0

Table 18 (continued)

	Total Control Discrimination Accuracy				
Base	N	Range	Median	Mean	Standard Deviation
Eglin	14	78-185	163.0	148.9	35.9
Moody	23	96-170	133.3	132.7	20.9
Tyndall	19	81-189	122.2	130.0	29.9

drinker group significantly differed at the $p<.01$ level. All of the other eight contrasts between group means were not significant at the $p<.01$ level. For the purposes of this research, these results were used to indicate that the group means from each base could be treated as an aggregate for computing a combined group mean for the appropriate random sample classifications of problem drinker, non-problem drinker, and non-drinker.

The sample of individuals admitted to an Air Force ARC was composed of 89 individuals. The general sample of Air Force active duty individuals was composed of 562 individuals. One-way analyses of variance, with group status as the independent variable and the appropriate control discrimination accuracy scale as the dependent variable, were conducted to examine group mean differences. Examination of group mean differences on the three control discrimination accuracy scales indicated that the difference in the mean scores for each scale was statistically significant at the $p<.001$ level (see Table 19).

By dividing the overall sample into the six previously described sub-groups, the comparison of group mean scores on the control discrimination accuracy scales was expanded for increased precision in examining group differences. One-way analyses of variance were conducted with the individual control discrimination accuracy scale as the dependent

Table 19

Examination of Individuals Admitted to an ARC and General Sample of Air Force Active Duty Individuals' Mean Scores on the Control Discrimination Accuracy Scales

Control Discrimination Accuracy Scales					
	Group				
	ARC (n=89)		General USAF (n=562)		
CDA Scale	Mean	St. Dev.	Mean	St. Dev.	F
ICDA	36.0	12.7	54.7	21.5	63.96*
ECDA	67.6	14.7	81.7	13.3	83.14*
TCDA	103.6	16.7	136.4	26.5	128.13*

*$p < .001$

variable and the six sub-groups of the sample treated as the independent variable. Scheffe's test of a posteriori contrasts indicated that the four problem drinking classifications (ARC alcoholic individual, local rehabilitation alcoholic individual, local rehabilitation problem drinking individual, and random sample problem drinking individual) tended as a group to significantly differ from the two non-problem drinking classifications (random non-problem drinking individuals and random non-drinking individuals) on the control discrimination accuracy scales (see Table 20).

The results of the Scheffe's tests found in Table 20 indicated that the ECDA and TCDA scales functioned as instruments capable of discriminating between the four problem drinking groups and the two non-problem drinking groups. The ICDA scale's discrimination potential was not quite as clear with the Local Rehabilitation Problem Drinking Individuals group not statistically different from the two non-problem drinking groups at the $p<.05$ level. An overall result indicated by the Scheffe's tests of the the groups' mean scores on the three control discrimination accuracy scales was that they did not function to discriminate among the problem drinking groups. The primary discrimination made by the control discrimination accuracy scales was between the problem drinking groups and the

Table 20

Examination of Drinking Status Classification Groups' Mean Scores on the Control Discrimination Accuracy Scales

Control Discrimination Accuracy Scales					
	Internal Control Discrimination Accuracy				
Group	N	Range	Mean	Standard Deviation	F
ARC Alcoholics	89	11-70	36.0	12.7	35.139
Local Rehab. Alcoholics	32	15-89	35.5	15.9	
Local Rehab. Prob. Drinkers	34	19-56	33.1	10.5	
Random Prob. Drinkers	52	11-63	36.5	12.6	
Random Non-Problem Drinkers	454	11-100	56.9	20.9	
Random Non-Drinkers	56	15-96	53.9	25.3	

Table 20 (continued)

Scheffe Analysis of Six Groups' ICDA Scores

	Local Rehab. Pr. Dr.	Local Rehab. Alc.	ARC Alc.	Random Prob. Drink	Random Non-Drink	Random Non-Pr Drink
Local Rehab. Problem Drinkers						
Local Rehab. Alcoholics						
ARC Alcoholics						
Random Problem Drinkers						
Random Non-Drinkers	*	*	*	*		
Random Non-Problem Drinkers	*	*	*	*		

(*) Denotes pairs of groups significantly different at the $p<.05$ level.

Table 20 (continued)

	External Control Discrimination Accuracy				
Group	N	Range	Mean	Standard Deviation	F
ARC Alcoholics	89	37-96	67.6	14.7	41.565
Local Rehab. Alcoholics	32	22-96	61.5	23.2	
Local Rehab. Prob. Drinkers	34	41-93	74.0	14.7	
Random Prob. Drinkers	52	22-100	67.3	17.6	
Random Non-Problem Drinkers	454	37-100	83.3	11.8	
Random Non-Drinkers	56	52-100	81.9	12.7	

Table 20 (continued)

Scheffe Analysis of Six Groups' ECDA Scores

	Local Rehab. Alc.	Random Prob. Drink	ARC Alc.	Local Rehab Pr. Dr.	Random Non-Drink	Random Non-Pr Drink
Local Rehab. Alcoholics						
Random Problem Drinkers	*		*	*	*	*
ARC Alcoholics						
Local Rehab. Problem Drinkers	*					
Random Non-Drinkers	*	*	*			
Random Non-Problem Drinkers	*	*	*	*		

(*) Denotes pairs of groups significantly different at the $p<.05$ level.

Table 20 (continued)

Group	Total Control Discrimination Accuracy				
	N	Range	Mean	Standard Deviation	F
ARC Alcoholics	89	63-148	103.6	16.7	73.182
Local Rehab. Alcoholics	32	52-185	97.0	26.9	
Local Rehab. Prob. Drinkers	34	67-133	107.1	15.0	
Random Prob. Drinkers	52	59-156	103.8	19.4	
Random Non-Problem Drinkers	454	63-196	140.2	24.3	
Random Non-Drinkers	56	78-189	135.8	28.8	

Table 20 (continued)

Scheffe Analysis of Six Groups' TCDA Scores

	Local Rehab. Alc.	ARC Alc.	Random Prob. Drink	Local Rehab. Pr. Dr.	Random Non-Drink	Random Non-Pr Drink
Local Rehab. Problem Drinkers						
Local Rehab. Alcoholics						
ARC Alcoholics						
Random Problem Drinkers						
Random Non-Drinkers	*		*	*	*	
Random Non-Problem Drinkers	*		*	*	*	

(*) Denotes pairs of groups significantly different at the $p<.05$ level.

non-problem drinking groups.

Testing of Hypothesis Two

Hypothesis Two was related to testing whether there was a negative correlation between Air Force active duty individuals' extent of problems with alcohol abuse and measured control discrimination accuracy. In light of the findings related to Hypothesis One that the problem drinking groups were not significantly different regarding measured control discrimination accuracy, Hypothesis Two was tested by correlating scores on the control discrimination accuracy scales to drinking status as a two level variable. The levels of the drinking status variable were formed by one level containing the respondents in the four problem drinking groups (n = 207) and the other level containing the respondents in the two non-problem drinking groups (n = 510). The correlations were computed using the Pearson product moment procedure. Examination of the produced correlations indicated negative directionality between higher extent of problems with alcohol abuse and measured control discrimination accuracy (see Table 21).

Table 21

Correlations Between Drinking Status and the Control Discrimination Accuracy Scales

	Control Discrimination Accuracy Scale		
	ICDA	ECDA	TCDA
Problem Drinking Groups	-.44*	-.46*	-.58*

*$p < .001$

Having confirmed the initial hypotheses, the relationship between control discrimination accuracy and alcohol abuse in the United States Air Force was examined in more detail.

CHAPTER VII

ADDITIONAL FINDINGS REGARDING THE RELATIONSHIP BETWEEN CONTROL DISCRIMINATION ACCURACY AND ALCOHOL ABUSE IN THE UNITED STATES AIR FORCE

Confirmation of the original research hypotheses indicated potential value for a more extensive examination of the relationship between control discrimination accuracy and alcohol abuse in the Air Force. Through the inclusion of demographic and psychometric variables in order to assess the validity of the control discrimination accuracy scales, an abundance of data existed to further examine the six classifications of the sample. In addition to having examined the statistical significance of control discrimination accuracy, this collection of measured variables provided the opportunity to examine the substantive significance of control discrimination accuracy through multiple regression analyses. Through a discriminant analysis the opportunity to assess the ability of the set of included variables to predict individuals who might be at risk for alcohol abuse also existed. Both of these opportunities for further examination of control discrimination accuracy were pursued.

Hierarchical Multiple Regression Analysis of the Control Discrimination Accuracy Data

The examination of Hypothesis One revealed that the lower mean scores on the control discrimination accuracy scales obtained by the sample of individuals admitted to an ARC were statistically significant at the $p<.001$ level in comparison to the higher mean scores obtained by the general sample of active duty Air Force members. This finding, although suggesting minimal possibility that the difference in mean scores could have occurred by chance, did not provide information regarding the substantive importance of this statistically significant difference. A hierarchical multiple regression analysis was conducted in order to examine the proportion of variance between individuals with alcoholism and non-problem drinkers that is explained by differences in control discrimination accuracy.

The hierarchical regression method was chosen due to its applicability for examining the relationship between variables from a theoretical perspective (Cohen & Cohen, 1983). By pre-determining the order in which the variables were entered into the regression equation, the researcher was able to perform a more stringent test of the proportion of explained variance that could be attributed to variance in control discrimination accuracy by entering control

discrimination accuracy last into the regression equation. Since in the hierarchical multiple regression method the shared variance between control discrimination accuracy and any of the previously entered variables would be attributed to the previously entered variables (Cohen & Cohen, 1983), the burden was placed on the variable of control discrimination accuracy to add sufficient explanatory power to the model to be retained.

In order to conduct the best test of the variables, Kerlinger's (1973) concept of maximizing the variance was employed. This was achieved by selecting the members from the groups that theoretically varied the most in their status regarding alcohol abuse. The members of the two groups containing individuals who had been diagnosed as alcoholic (n = 121) and the members of the random sample who had been classified as non-problem drinkers (n = 454) were selected for this purpose. The group of individuals who had been classified as non-drinkers were not included in this analysis since the issue was to examine the difference in outcome for individuals who consume alcohol rather than to examine differences between individuals who consume alcohol and individuals who do not.

The initial step in the regression analysis was to perform a preliminary examination of the correlations between the variables included in the research study and a

categorical variable called drinking status which included two levels: 1) individuals diagnosed as alcoholic and 2) individuals classified as non-problem drinkers. The variables considered in the preliminary examination were: 1) sex, 2) number of dependents, 3) residence in barracks or not, 4) married or unmarried, 5) accompanied by spouse if married or not accompanied by spouse, 6) Caucasian or non-Caucasian, 7) father abuse alcohol or not abuse alcohol, 8) mother abuse alcohol or not abuse alcohol, 9) age, 10) completed years of education, 11) military rank, 12) number of months in the military, 13) monthly frequency of alcohol consumption, 14) score on the ICDA scale, 15) score on the ECDA scale, 16) score on the TCDA scale, 17) score on the POI (I) scale, 18) score on the POI (TC) scale, 19) score on the Trent Internality scale, 20) score on the Trent Externality scale, and 21) score on the T-Gap scale. Pearson correlation coefficients were computed to make the preliminary examination of the variables (see Table 22).

Selection of the variables to be included in a regression analysis was based on the strength of the derived correlations in Table 22. The variables with correlations of .10 or less were deleted from further consideration since their eventual proportion of explained variance in a regression equation would be insignificant. The described criterion resulted in deletion of: 1) sex, 2) number of

Table 22

Correlations Between Research Variables and Drinking Status

	Research Variable				
	Sex	Age	Ethnic Group	Marital Status	# of Dependents
Correlation With Drinking Status	.09	-.02	.03	.15	.01
Cases	575	575	575	575	575
Probability	.001	.356	.230	.001	.424

	Research Variable			
	Quarters	Accompanied By Spouse	Education	Rank
Correlation With Drinking Status	.18	.29	.23	.17
Cases	575	368	575	575
Probability	.001	.001	.001	.001

Table 22 (continued)

	Research Variable			
	Time in Military	Drinking Frequency	Paternal Alcohol Abuse	Maternal Alcohol Abuse
Correlation With Drinking Status	-.04	-.19	.17	.04
Cases	575	575	547	567
Probability	.157	.001	.001	.181

	Research Variable				
	ICDA	ECDA	TCDA	POI (I)	POI (TC)
Correlation With Drinking Status	.40	.47	.56	.51	.41
Cases	575	575	575	575	575
Probability	.001	.001	.001	.001	.001

Table 22 (continued)

	Research Variable		
	Trent Internality	Trent Externality	T-Gap
Correlation With Drinking Status	.20	-.22	.27
Cases	575	575	575
Probability	.001	.001	.001

Note. Drinking Status scored as a binary variable with individuals diagnosed as alcoholic scored as 0 and individual classified as non-problem drinkers scored as 1.

dependents, 3) Caucasian or non-Caucasian, 4) mother abuse alcohol or not abuse alcohol, 8) age, and 9) number of months in the military. Since the basic focus of the research was on the potential role of control discrimination accuracy for explaining variance in alcohol abuse, only the three control discrimination accuracy scales were retained for developing the regression equation.

The remaining variables were them classified into three sets of variables: 1) demographic related, 2) drinking behavior related, and 3) control discrimination accuracy related. The retained demographic related variables included: 1) residence in barracks or not, 2) married or unmarried, 3) accompanied by spouse if married or not accompanied by spouse, 4) father abuse alcohol or not abuse alcohol, 5) completed years of education, and 6) military rank. The retained drinking related variable was monthly frequency of alcohol consumption. The retained control discrimination accuracy variables were the ICDA, ECDA, and TCDA scales.

In order to further improve the potential parsimony of the final regression equation, a forward regression analysis including all of the retained demographic variables was conducted. The results of the analysis indicated that the variables of "military rank" and "married or unmarried" should also be deleted from the regression equation due to

their absence of statistical significance (see Table 23).

An additional modification of the variables for the regression equation involved the "frequency of drinking" variable. The correlation (-.19) between frequency of drinking and drinking status of diagnosed alcoholism or non-problem drinking was not as strong as might be expected. This finding led to a closer examination of the "frequency of drinking" variable.

Closer examination of the group of individuals diagnosed as alcoholic revealed that 40 of the 121 respondents in the group reported they had not drank any alcohol in the previous month. It is possible that these reports of no drinking were accurate of the previous month but not reflective of the individual's actual drinking pattern. The reason for this possibility is that many of the individuals admitted to an ARC were in the local base alcohol abuse rehabilitation program immediately prior to referral to an ARC. As previously discussed, Air Force Regulation 160-36 encourages efforts at the local level in alcohol abuse rehabilitation prior to referral to one of the regional ARCs. This implies that individuals referred to an ARC are in a monitored status that would differ from their normal condition. It is quite possible that while in this monitored status the individual did modify his or her drinking behavior. On the other hand, it is unlikely that a

Table 23

Forward Regression Analysis

of the Potential Demographic Variables

Retained Variables	B_j	SB_j	T	Probability
Education	.17	.04	3.99	.0001
Accompanied by Spouse	-.13	.04	-3.07	.0022
Father Abuse Alcohol	-.11	.04	-2.66	.0081
Barracks or Non-Barracks	.09	.04	2.10	.0359
Deleted Variables	B_j	SB_j	T	Probability
Military Rank	---	---	-.40	.6903
Married or Non-Married	---	---	-.51	.6132

Note. The B_j and SB_j are the standardized point estimate estimate and standard error of the standardized estimate.

modified drinking behavior of abstinence from alcohol would be an accurate reflection of the individual's normal drinking behavior. For these reasons the 40 responses of no drinking in the previous month were deleted from computing the frequency of drinking for the group of individuals diagnosed as alcoholic.

The modification in the "frequency of drinking" variable for the individuals diagnosed as alcoholic group resulted in an increase in the variable's mean for the group (see Table 24).

Table 24

Modification of the Monthly Frequency of Drinking Variable For the Individuals Diagnosed as Alcoholic

Condition	N	Range	Median	Mean	Standard Deviation
All Diagnosed Alcoholics	121	0-30	3.5	9.9	11.0
"Non-Drinkers" Deleted	81	1-30	15.2	14.7	10.6

The increase in drinking frequency from 9.9 to 14.7 times a month from the modification in the data was considered to provide a more accurate representation of the drinking

behavior of the group of individuals diagnosed as alcoholic. It should be noted that this figure is quite possibly low since many of the reports of drinking frequency may have been affected by the monitored status of the respondents. This modification resulted in an increased relationship between frequency of drinking and drinking status. The correlation increased in strength from -.19 to -.38.

The preliminary examinations of the variables resulted in a regression equation containing four demographic variables (completed years of education, residence in barracks or not, father abuse alcohol or not abuse alcohol, accompanied by spouse if married or not accompanied by spouse), a drinking behavior variable of monthly frequency of drinking, and the control discrimination accuracy variables. The hierarchy of variable entry was to enter the set of demographic variables first, then the drinking behavior variable, and lastly, the control discrimination accuracy variables.

As previously discussed, several ways to assess control discrimination accuracy through the control discrimination accuracy scales had been found. One way was to examine the individual's ICDA and ECDA scale scores. Another way was to examine the result of combining the ICDA and ECDA scale scores into one total score -- the TCDA scale score. A

third way was to use the ICDA and ECDA scale scores to make assessments of the individual's control discrimination accuracy type (CDA-Type). Since much of this research was of an exploratory nature, each of the possible means to assess control discrimination accuracy was utilized in a separate hierarchical regression analysis run.

In the first hierarchical regression analysis, the regression equation included the ICDA and ECDA scale scores for examination of the role of control discrimination accuracy in explaining variance. The correlations of the independent variables with the dependent variable of drinking status ranged in strength from -.13 for residence in barracks or non-barracks to .50 for the ECDA scale. Examination of the correlational matrix containing the independent variables indicated no problems with multicollinearity (see Table 25).

The proportion of variance in drinking status, as indicated by the coefficient of determination (R^2), explained by the hierarchical regression equation using the ICDA and ECDA scales to examine control discrimination accuracy was .44. This result was statistically significant at the .001 alpha level ($F[7,493] = 54.99$, $p<.001$). The standardized point estimates and coefficient of determination change for each variable are found in Table 26.

Table 25

Correlations Between Variables

Using the ICDA and ECDA Scales

Variable	2	3	4	5	6	7	8
1. Education	-.11	.04	-.28	.02	.11	.05	.22
2. Unaccompanied By Spouse	--	-.12	-.15	.13	-.12	-.10	-.20
3. Father Not Abuse Alcohol		--	.26	-.14	.06	.15	.17
4. Residence in Barracks			--	.09	-.01	.03	-.13
5. Frequency of Drinking				--	-.15	-.17	-.38
6. ICDA					--	.16	.35
7. ECDA						--	.50
8. Drinking Status							--

Note. Drinking Status scored as a binary variable with individuals diagnosed as alcoholic scored as 0 and individuals classified as non-problem drinkers scored as 1.

Table 26

Hierarchical Regression Results

Using the ICDA and ECDA Scales

Variables	Standardized B_j	T	R^2 Change
Education	.123	3.37***	.047
Unaccompanied By Spouse	-.085	-2.39*	.024
Father Not Abuse Alcohol	.099	2.54*	.025
Residence in Barracks	-.115	-3.00**	.023
Frequency of Drinking	-.251	-7.04***	.107
ICDA	.219	6.23***	.045
ECDA	.395	11.31***	.172

Note. Drinking Status scored as a binary variable with individuals diagnosed as alcoholic scored as 0 and individuals classified as non-problem drinkers scored as 1.
N=493, R^2=.44.
*p<.05 **p<.01 ***p<.001

In the next hierarchical regression analysis, the regression equation included only the TCDA scale scores for examination of the role of control discrimination accuracy in explaining variance. The correlations of the independent variables with the dependent variable of drinking status ranged in strength from -.13 for residence in barracks or non-barracks to .54 for the ECDA scale. Again there was no indication of any problems with multicollinearity. All of the correlations listed in Table 25 remained the same except for those associated with the TCDA scale.

The proportion of variance in drinking status, as indicated by the coefficient of determination (R^2), explained by the hierarchical regression equation using only the TCDA scale to examine control discrimination accuracy was .41. This result was statistically significant at the .001 alpha level ($F[7,493] = 56.49$, $p<.001$). The standardized point estimates and coefficient of determination change for each variable are found in Table 27.

In the third hierarchical regression analysis, the regression equation included the CDA-Type classifications for examination of the role of control discrimination accuracy in explaining variance. CDA-Type was set up as a dummy variable with CDA-Type 3 as the contrast variable.

Table 27

Hierarchical Regression Results

Using the TCDA Scale

Variables	Standardized B_j	T	R^2 Change
Education	.132	3.54***	.047
Unaccompanied By Spouse	-.091	-2.51*	.024
Father Not Abuse Alcohol	.082	2.21*	.025
Residence in Barracks	-.115	-2.95**	.023
Frequency of Drinking	-.254	-6.95***	.107
TCDA	.447	12.34***	.185

Note. Drinking Status scored as a binary variable with individuals diagnosed as alcoholic scored as 0 and individuals classified as non-problem drinkers scored as 1.

N=493, R^2=.41.

*p<.05 **p<.01 ***p<.001

The correlations of the independent variables with the dependent variable of drinking status ranged in strength from -.07 for CDA-Type 2 to -.40 for CDA-Type 4. There was no indication of any problems with multicollinearity. All of the correlations listed in Table 25 remained the same except for those associated with the CDA-Type.

The proportion of variance in drinking status, as indicated by the coefficient of determination (R^2), explained by the hierarchical regression equation using CDA-Type to examine control discrimination accuracy was .36. This result was statistically significant at the .001 alpha level ($\underline{F}[7,493] = 34.24$, $\underline{p}<.001$). The standardized point estimates and coefficient of determination change for each variable are found in Table 28.

Comparing the three variations in assessing control discrimination accuracy, the proportion of variance in drinking status explained by the regression equations ranged from .36 to .44 (see Table 29).

Table 28

Hierarchical Regression Results

Using the CDA-Types

Variables	Standardized B_j	T	R^2 Change
Education	.142	3.64***	.047
Unaccompanied By Spouse	-.113	-3.00**	.024
Father Not Abuse Alcohol	.088	2.25*	.025
Residence in Barracks	-.128	-3.14**	.023
Frequency of Drinking	-.276	-7.25***	.107
CDA-Type 1	.153	5.43**	.012
CDA-Type 2	-.072	-1.53	.006
CDA-Type 4	-.284	-6.15***	.117

Note. Drinking Status scored as a binary variable with individuals diagnosed as alcoholic scored as 0 and individuals classified as non-problem drinkers scored as 1.

N=493, R^2=.36.

*p<.05 **p<.01 ***p<.001

Table 29

Summary Table of Explained Variance

Resulting From Utilized Regression Equations

Form of CDA	Demographic Variables		Drinking Behavior		CDA		Total
ICDA & ECDA	.120	+	.106	+	.185	=	.411
TCDA	.120	+	.106	+	.216	=	.442
CDA-Type	.120	+	.106	+	.135	=	.361

In each variation of the hierarchical regression equations, control discrimination accuracy accounted for the greatest proportion of explained variance in comparison to the set of demographic variables and the drinking behavior variable. The importance of this finding is enhanced by focusing on the stringent test of the proportion of explained variance attributed to variance in control discrimination accuracy by entering control discrimination accuracy last into the regression equation. All of the shared variance between control discrimination accuracy and any of the previously entered variables was attributed to the previously entered variables. The results indicate the importance of control discrimination accuracy in discriminating between individuals diagnosed as alcoholic and individuals

classified as non-problem drinkers even after differences in variables such as family drinking history, years of completed education, and monthly frequency of drinking are accounted for.

Discriminant Analysis of the Control Discrimination Accuracy Data

Identification of the variables for the regression equation in explaining variance between individuals diagnosed as alcoholic and individuals classified as non-problem drinkers provided the opportunity to conduct discriminant analyses. Through discriminant analysis an examination was made of how well the variables included in the hierarchical regression equation (completed years of education, residence in barracks or not, father abuse alcohol or not abuse alcohol, accompanied by spouse if married or not accompanied by spouse, monthly frequency of drinking, and the control discrimination accuracy variables) would function to discriminate between the five various levels of drinking status examined in the study. The group of non-drinking individuals was not included in any of the analyses since the purpose of the discriminant analysis was not to discriminate between individuals who consume alcohol and those who do not. The purpose was to discriminate between those who consume alcohol and do not have alcohol abuse problems and those who do have alcohol abuse

problems.

The initial discriminant analysis procedure included all of the respondents who were classified in any of the following groups: 1) individuals diagnosed as alcoholic admitted to an ARC, 2) individuals diagnosed as alcoholic enrolled in a local base program, 3) individuals classified as problem drinker enrolled in a local base program, 4) respondents in the random survey classified as problem drinkers, and 5) respondents in the random survey classified as non-problem drinkers. Examination of the results indicated that the two local base alcohol abuse rehabilitation groups were not significantly different at the $p<.10$ level. This result indicated that further examination of the included variables' ability to discriminate between the five drinking status groups was not warranted.

Taking the results of the initial discriminant analysis into account, the five groups were collapsed into three groups. The groups of individuals diagnosed as alcoholic admitted to an ARC, individuals diagnosed as alcoholic enrolled in a local base program, and individuals classified as problem drinker enrolled in a local base program were collapsed to form one group of individuals classified by the Air Force as having problems with alcohol. A second group was composed of the random sampled individuals classified as

non-problem drinking individuals. A third group, which functioned as a test group, was composed of the random sampled individuals classified as problem drinkers.

After collapsing the five groups into three, the discriminant potential of the variables was then examined on a graduated basis of first examining the four demographic variables alone; second, examining the effect of adding the monthly frequency of drinking variable; and then examining the effect of adding control discrimination accuracy. The effect of adding control discrimination accuracy was examined by using each of the means utilized in the hierarchical regression analyses for assessing control discrimination accuracy.

A key factor employed for evaluating the predicted group memberships of the discriminant analyses was to compare the proportions of cases that were correctly predicted to the results that could have been expected by chance alone. For example, in the discriminant analysis with only the four demographic variables included there were 155 individuals classified by the Air Force as having problems with alcohol and 454 random sampled individuals classified as non-problem drinking individuals. The proportion between the groups was approximately 25:75. This distribution between the two groups would indicate that in a situation where nothing was known about the total of 609, a

discrimination between the two groups could achieve an correct prediction rate of 75% through chance alone by predicting all of the cases were non-problem drinking individuals. Through this capitalization on chance procedure, 100% of the non-problem drinkers would have been placed in the correct group while none of the individuals classified as having problems with alcohol would have been placed in the correct group. The opposite approach of predicting all of the cases were individuals having problems with alcohol could achieve an accurate classification rate of 25% through chance alone with a resulting inverse of which groups were accurately and inaccurately predicted.

The rate at which through chance alone correct predictions could be made was defined as the "base rate". All predictions that resulted from the discriminant analyses were evaluated in comparison to the base rates. The rationale was that any discriminant contribution made by a variable or set of variables must be an improvement over chance alone in order to be considered to have potential value.

The discriminant analysis only including the four demographic variables indicated that the predicted group membership of the individuals classified as having problems with alcohol was less than the base rate (see Table 30). The total obtained rate of accurate predictions was barely above

Table 30

Discriminant Analysis Only Including Demograhic Variables

		Predicted Group Membership	
Actual Group	N	Group 1	Group 2
Group 1			
Individuals Classified By the Air Force as Having Problems With Alcohol	155	34 (21.9%)	121 (78.1%)
Group 2			
Individuals Classified As Non-Problem Drinkers	454	21 (4.6%)	433 (95.4%)
Group 3			
Individuals From Random Sample Classified As Problem Drinkers	52	16 (30.8%)	36 (69.2%)

	Evaluation of Predicted Group Membership		
Group	Base Rate		Obtained Accuracy Rate
Group 1	25.5%	>	21.9%
Group 2	74.5%	<	95.4%
Total	74.5%	<	76.7%

the rate that could have been achieved through chance, 76.7% prediction accuracy compared to a 74.5% base rate.

Adding the drinking behavior variable of monthly drinking frequency improved the prediction accuracy of the individuals classified as having problems with alcohol to a rate above the base rate (see Table 31). The total obtained rate of accurate predictions remained close to the base rate, 82.6% compared to 79.8%.

Combining the demographic and drinking behavior variables with the TCDA scale as the means to asses the control discrimination accuracy variable resulted in a 25 percentage point improvement (from a 37.4% rate to a 62.6% rate) in the prediction accuracy of the individuals classified as having problems with alcohol in comparison to the rate obtained by using only the demographic and drinking behavior variables (see Table 32). The total obtained rate of accurate predictions resulting from this combination of all of the variables included in the regression equation was an 88.2% accuracy rate for predictions. Utilizing the ICDA and ECDA scales instead of the TCDA scale to assess control discrimination accuracy in combination with the other variables produced results similar to those obtained using the TCDA scale (see Table 33). The accuracy rate for predictions was 88.4%. The discriminant analysis with the CDA-Type method for assessing control discrimination

Table 31

Discriminant Analysis Including Demograhic and Drinking Behavior Variables

		Predicted Group Membership	
Actual Group	N	Group 1	Group 2
Group 1			
Individuals Classified By the Air Force as Having Problems With Alcohol	115	43 (37.4%)	72 (62.6%)
Group 2			
Individuals Classified As Non-Problem Drinkers	454	27 (5.9%)	427 (94.1%)
Group 3			
Individuals From Random Sample Classified As Problem Drinkers	52	18 (34.6%)	34 (65.4%)

	Evaluation of Predicted Group Membership		
Group	Base Rate		Obtained Accuracy Rate
Group 1	20.2%	<	37.4%
Group 2	79.8%	<	94.1%
Total	79.8%	<	82.6%

Table 32

Discriminant Analysis With Demograhic, Drinking Behavior, and Control Discrimination Accuracy (TCDA) Variables

		Predicted Group Membership	
Actual Group	N	Group 1	Group 2
Group 1			
Individuals Classified By the Air Force as Having Problems With Alcohol	115	72 (62.6%)	43 (37.4%)
Group 2			
Individuals Classified As Non-Problem Drinkers	454	24 (5.3%)	430 (94.7%)
Group 3			
Individuals From Random Sample Classified As Problem Drinkers	52	32 (61.5%)	20 (38.5%)

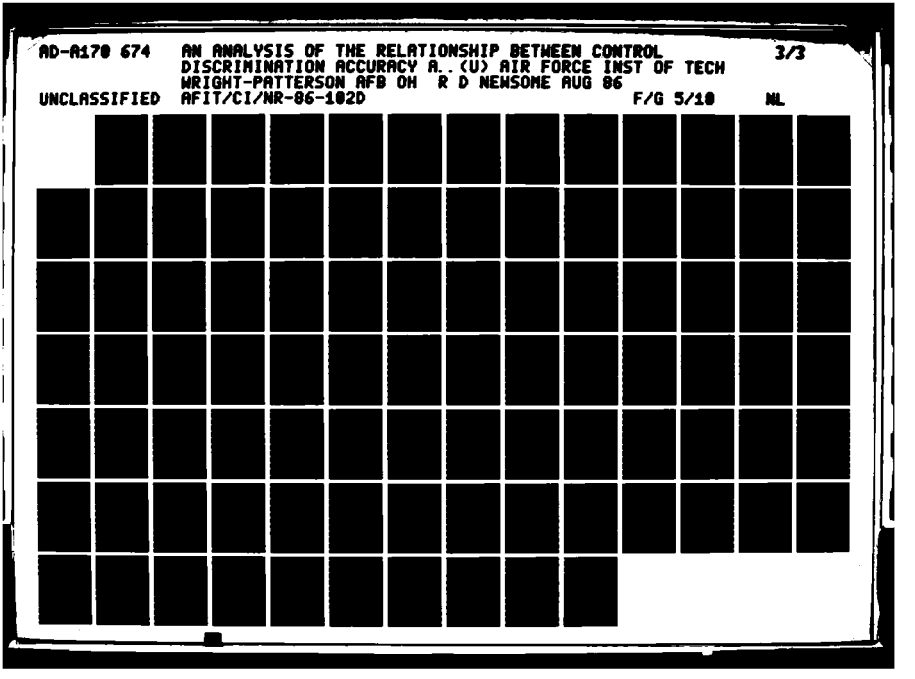
	Evaluation of Predicted Group Membership		
Group	Base Rate		Obtained Accuracy Rate
Group 1	20.2%	<	62.6%
Group 2	79.8%	<	94.7%
Total	79.8%	<	88.2%

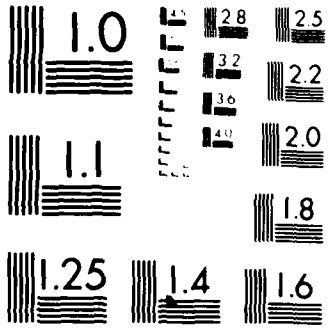
Table 33

Discriminant Analysis With Demograhic, Drinking Behavior, and Control Discrimination Accuracy (ICDA and ECDA) Variables

		Predicted Group Membership	
Actual Group	N	Group 1	Group 2
Group 1			
Individuals Classified By the Air Force as Having Problems With Alcohol	115	70 (60.9%)	45 (39.1%)
Group 2			
Individuals Classified As Non-Problem Drinkers	454	21 (4.6%)	433 (95.4%)
Group 3			
Individuals From Random Sample Classified As Problem Drinkers	52	29 (55.8%)	23 (44.2%)

	Evaluation of Predicted Group Membership		
Group	Base Rate		Obtained Accuracy Rate
Group 1	20.2%	<	60.9%
Group 2	79.8%	<	95.4%
Total	79.8%	<	88.4%


AD-A170 674 AN ANALYSIS OF THE RELATIONSHIP BETWEEN CONTROL
DISCRIMINATION ACCURACY A..(U) AIR FORCE INST OF TECH
WRIGHT-PATTERSON AFB OH R D NEWSOME AUG 86
UNCLASSIFIED AFIT/CI/NR-86-102D
3/3
F/G 5/10
NL



accuracy in combination with the other variables produced the lowest prediction accuracy rate (84.5%) of the three methods for assessing control discrimination accuracy (see Table 34).

The progression in improved prediction accuracy for the known groups that resulted from adding variables held true for the test group as well. The group of individuals from the random sample classified as problem drinkers were increasingly predicted as belonging to the classified as having problems with alcohol group (Group 1) as more variables were added to the discriminant analyses. The greatest improvement occurred when the control discrimination accuracy variable was added. Using the TCDA scale method to assess control discrimination accuracy, 61.5% (32 of 52) of the random sample individuals classified as problem drinkers were predicted as belonging to the classified as having problems with alcohol group.

Interpretation of the potential importance of these discriminant analyses can be made if it is kept in mind that the only criteria used for making the predictions of drinking status were the six variables contained in the hierarchical regression equation. In an actual practice situation, it would be unlikely that the only information a clinician would be aware of would be data regarding completed years of education, residence in barracks or not,

Table 34

Discriminant Analysis Including Demograhic, Drinking Behavior, and Control Discrimination Accuracy (CDA-Type) Variables

		Predicted Group Membership	
Actual Group	N	Group 1	Group 2
Group 1			
Individuals Classified By the Air Force as Having Problems With Alcohol	115	57 (49.6%)	58 (50.4%)
Group 2			
Individuals Classified As Non-Problem Drinkers	454	30 (6.7%)	424 (93.3%)
Group 3			
Individuals From Random Sample Classified As Problem Drinkers	52	28 (55.8%)	24 (44.2%)

	Evaluation of Predicted Group Membership		
Group	Base Rate		Obtained Accuracy Rate
Group 1	20.2%	<	49.6%
Group 2	79.8%	<	93.3%
Total	79.8%	<	84.5%

father abuse alcohol or not abuse alcohol, accompanied by spouse if married or not accompanied by spouse, monthly frequency of drinking, and control discrimination accuracy.

It would seem quite probable that an additional area of information that would be known by a clinician would be drinking related incident data. It was not possible to include drinking related incident data in the discriminant analyses conducted in this research since drinking related incident data was used to define the groups. It would have been redundant to use drinking related incident data to define the groups and then assess whether drinking related incident data functions to discriminate between the groups. The resulting predictions would have had an artificially high rate of accuracy. The potential value of the obtained prediction accuracy rates is reinforced by noting that alcohol related incident data was not utilized for making the predictions. It would seem reasonable that the inclusion of alcohol related incident data would function to improve the obtained accurate prediction rate of 88% to an even higher rate.

Even though it was not possible to examine the contribution to explained variance that alcohol related incidents as a variable would make to this study's regression equations and discriminant analyses, it was possible to examine the proportion of variance in alcohol

related incidents explained by control discrimination accuracy. Forward regression analysis with alcohol related incidents as the dependent variable and the ICDA and ECDA scales used to represent control discrimination accuracy as the independent variable, the obtained coefficient of determination was .32 (see Table 35). The relationship between control discrimination accuracy measured by the TCDA scale and alcohol related incidents (r=-.56, N=717) was stronger than the relationship between control discrimination accuracy and monthly alcohol consumption (r=-.14, N=717). This contrast suggests a stronger relationship between control discrimination accuracy and consequential behavior of alcohol consumption than directly between control discrimination accuracy and alcohol consumption. The obtained proportion of explained variance from the forward regression analysis suggests an important linkage between control discrimination accuracy and alcohol related incidents. Since alcohol related incidents had been previously demonstrated by Rand (Polich & Orvis, 1979) to be second to intoxication as the most important variables regarding alcohol dependence, an intervention model can be theorized for focus on control discrimination accuracy to modify the likelihood of an individual being involved in alcohol related incidents. This potential intervention advantage emphasizes the utility of accurate control discrimination training as a valuable component of alcohol

Table 35

Forward Regression Analysis

of the Relationship Between Control Discrimination Accuracy

and Alcohol Related Incidents

Variables	Standardized B_j	T	R^2 Change
ECDA	-.381	-12.17*	.199
ICDA	-.358	-11.45*	.124

Note. Drinking related incidents scored as a binary variable with no alcohol related incident in the past year scored as 0 and at least one alcohol related incident in the past year scored as 1.

N=717, R^2=.32.

*p<.0001

abuse prevention and rehabilitation programs.

CHAPTER VIII

COMPARISON OF CONTROL DISCRIMINATION ACCURACY AND LOCUS OF CONTROL AS CONSTRUCTS FOR CHARACTERIZING ALCOHOLIC INDIVIDUALS

The theoretical representations of the CDA-Types were previously discussed. CDA-Type 2 was theorized to represent individuals with an external locus of control orientation since they perceive they can control what they do and what others do. CDA-Type 3 was theorized to represent individuals with an external locus of control since they believe they do not control what they do or what others do, but that control lies in the external domain. It was further theorized that CDA-Type 1 and CDA-Type 4 individuals are not addressed by the dichotomous internal-external locus of control construct since their view of control is a blend of internal and external control orientations.

A means to examine the theoretical perspective of the relationship between control discrimination accuracy and locus of control constructs existed in this research since one of the instruments used in the study was a locus of control instrument. The LODP scale was designed to evaluate locus of control with individuals who have been classified as having a drinking problem. According to Stafford (1980),

the LODP scale is related to locus of control as measured by Rotter's Internal-External Locus of Control scale.

As a locus of control measure of the dichotomous internal and external control orientations, the LODP scale would be expected to discriminate between the internal control orientation of CDA-Type 2 individuals and the external control orientation of CDA-Type 3 individuals if these CDA-Types are representative of the dichotomous locus of control classifications. If CDA-Type 1 and CDA-Type 4 individuals are not addressed by the dichotomous locus of control construct, it would be expected that these individuals' LODP scores would not function to classify them as internal or external in control orientation.

In order to examine the theoretical relationship between the particular CDA-Type and the locus of control construct, a one-way analysis of variance was conducted with the LODP scale treated as the dependent variable and CDA-Type treated as the independent variable. Scheffe's test of a posteriori contrasts indicated that only the mean scores on the LODP scale for CDA-Type 2 and CDA-Type 3 individuals significantly differed at the $p<.05$ level (see Table 36). All of the other contrasts between group means were not significant at the $p<.05$ level. This result corresponded well with the previously stated theoretical perspectives for the CDA-Types.

Table 36

Examination of CDA-Type Mean Scores

on the Locus of Drinking Problem Scale

CDA-Type	N	Range	Mean	Standard Deviation	F
CDA-Type 1	5	2-8	3.8	2.5	4.287*
CDA-Type 2	36	2-11	5.1	1.9	
CDA-Type 3	41	2-11	6.6	2.4	
CDA-Type 4	73	2-12	5.4	2.4	

*p<.01.

Scheffe Analysis of CDA-Type LODP Scores

	CDA-Type 1	CDA-Type 2	CDA-Type 3	CDA-Type 4
CDA-Type 1				
CDA-Type 2				
CDA-Type 3		*		
CDA-Type 4				

(*) Denotes pairs of groups significantly different at the p<.05 level.

With a finding that the locus of control measure significantly discriminated only between CDA-Type 2 and CDA-Type 3 individuals, a question of interest was to examine which CDA-Types best functioned to discriminate between individuals diagnosed as alcoholic and individuals classified as non-problem drinkers. A forward regression analysis was conducted with the CDA-Types as independent variables and drinking status as a two level categorical dependent variable containing one level for individuals diagnosed as alcoholic and the other level containing individuals classified as non-problem drinkers. The correlations of the independent variables with the dependent variable of drinking status ranged in strength from -.41 for CDA-Type 4 to -.03 for CDA-Type 3. Examination of the correlational matrix containing the independent variables indicated no problems with multicollinearity (see Table 37). This was an expected result since the CDA-Types were created as mutually exclusive categories. The correlational results confirmed the mutual exclusiveness of the CDA-Types.

The proportion of variance in drinking status, as indicated by the coefficient of determination (R^2), explained by the forward regression equation using the CDA-Types was .22. This result was statistically significant at the .001 alpha level ($F[2,572] = 85.07$, $p<.001$). Computed T-tests indicated that only CDA-Type 1 and CDA-Type 4 were

Table 37

Correlations Between CDA-Types and Drinking Status

Variable	2	3	4	5
1. CDA-Type	-.43	-.40	-.39	.39
2. CDA-Type 2	--	-.26	-.25	-.05
3. CDA-Type 3		--	-.23	-.03
4. CDA-Type 4			--	-.41
5. Drinking Status				--

Note. Drinking Status scored as a binary variable with individuals diagnosed as alcoholic scored as 0 and individuals classified as non-problem drinkers scored as 1.

statistically significant in discriminating between the two levels of drinking status. The two CDA-Types, CDA-Type 2 and CDA-Type 3, which functioned in a similar manner to the locus of control construct did not contribute to explaining variance between individuals diagnosed as alcoholic and individuals classified as non-problem drinker (see Table 38).

The results of the regression analysis indicated that representations of the internal and external dichotomies of the locus of control construct did not function to discriminate between individuals diagnosed as alcoholic and individuals classified as non-problem drinker. On the other hand, the extreme categories of accurate and inaccurate control discrimination, CDA-Type 1 and CDA-Type 4, did function to discriminate between the two analyzed levels of drinking status. These results support construct divergence between control discrimination accuracy and locus of control. In addition, these results indicate potential advantages for control discrimination accuracy as compared to locus of control as a construct for characterizing individuals diagnosed as alcoholic. Although these results should be viewed as preliminary to a more extensive examination of the relationship between control discrimination accuracy and locus of control, they are quite consistent with the initial control discrimination accuracy

Table 38

Forward Regression Analysis of the Relationship Between CDA-Types and Drinking Status

	Retained Variables		
Variables	Standardized B_j	t	R^2 Change
CDA-Type 4	-.307	-7.69**	.169
CDA-Type 1	.267	6.69**	.060

	Deleted Variables
Variables	t
CDA-Type 2	-.30*
CDA-Type 3	.30*

Note. Drinking Status scored as a binary variable with individuals diagnosed as alcoholic scored as 0 and individuals classified as non-problem drinkers scored as 1. $N=575$, $R^2=.23$.
*$p>.10$ **$p<.001$

theoretical perspectives regarding the representations made by the CDA-Types and the potential for control discrimination accuracy to be an improved construct over locus of control in connection to characterizing individuals diagnosed as alcoholic.

CHAPTER IX

GENERALIZING THE RESEARCH FINDINGS

Generalizing the results of the research to the United States Air Force was dependent on how well the study's sample was representative of the population of active duty members in the Air Force. As previously discussed, a variety of sampling procedures was employed in the study. In order to examine the representativeness of the research samples, previous studies of similar groups in the Air Force and previous results on scales administered in the study were utilized for comparison to the obtained results.

The sample of individuals admitted to an ARC was selected on a theoretical basis that the Sheppard ARC, as an overflow facility for the continental United States, worked with a representative sample of all active duty Air Force individuals admitted to ARCs (at least those within the continental United States). Two previous studies, Hauge (1979) and Myers (1983), provided data on active duty Air Force individuals admitted to Air Force ARCs. The Hauge (1979) study, containing 83 respondents, was derived from a sample of active duty Air Force individuals admitted to an ARC worldwide. The Myers (1983) study, containing data on 2607 individuals, reported on various demographic

characteristics of all active duty Air Force individuals admitted to an ARC during 1981 and 1982. The data from these studies was compared with this study's data on the sample of active duty Air Force individuals admitted to the Sheppard ARC.

Comparison between this study's sample of active duty Air Force individuals admitted to an ARC and the Hauge (1979) and Myers (1983) samples revealed basic similarity. (see Table 39). The results indicated that this study's sample was on the average slightly younger (29 years old compared to 32 years old) with, on the average, slightly less time on active duty (8.6 years compared to 11.2 years) than the Hauge (1979) sample. On all of the other variables the results were quite similar. The similarity between the Myers (1983) study of individuals admitted to an ARC and this study regarding proportionality of sex and officer/enlisted ratio provides strong evidence for having achieved a degree of representativeness by using the Sheppard ARC to create the ARC sample. The comparison of the studies supports the theoretical position that data collected from active duty individuals admitted to the Sheppard ARC would be representative of active duty Air Force individuals admitted to an ARC in general.

This study's general Air Force sample was compared to the Rand Study (Polich & Orvis, 1979) general sample. Both

Table 39

Comparison of Data From Studies of Active Duty Air Force Individuals Admitted to an ARC

Variable	Research Study: Hauge (1979) N=83	Myers (1983) N=2607	Newsome (1986) N=89
Sex	96% male	91% male	91% male
Age	M= 32	--	M= 29.3
Race	84% white	--	79% white
Education	12.7 years	--	13.1 years
Marital Status	49% married	--	51% married
Time on Active Duty	11.2 years	--	8.6 years
Officer/ Enlisted Ratio	6% officers	6% officers	6% officers
Most Frequent Rank	Staff Sergeant	--	Staff Sergeant

samples were randomly selected. The Rand Study had found that their sample was quite representative of active duty individuals in the Air Force regarding various demographic characteristics. It was proposed that, in general, similarity between the results of the Rand Study and results of this study would serve to support a position that this study's random sample was a representative sample of active duty Air Force members.

Comparison of this study's general sample of active duty Air Force individuals to the Rand (Polich & Orvis, 1979) study's sample revealed basic similarity between the two studies in regard to demographic and drinking related variables (see Table 40). The two major dissimilarities between the samples were related to sex and education. It would appear that both of these dissimilarities can be explained by changes in the Air Force from the mid-1970s to the mid-1980s. The proportion of females in the Air Force increased during that period. The educational standards for admission to the Air Force were raised as entry requirements into the military in general were raised. Examination of the variables of age, rank, marital status, and frequency of drinking indicated overall similar proportions of distribution among the randomly sampled individuals.

As a self-report survey, the accuracy of this study's reports of alcohol related incidents was considered

Table 40

Comparison of Data From Studies

of Random Sampled Active Duty Air Force Indviduals

Variable	Research Study: Rand (1979) N=3148	Research Study: Newsome (1986) N=562
Sex		
Male	92.6%	82.6%
Female	7.4%	17.4%
Age		
17-20	16.6%	6.8%
21-24	28.5%	33.5%
25-30	25.1%	29.5%
31-39	21.3%	22.7%
40-48	8.0%	7.3%
49-60	0.5%	0.2%
Education		
Non-High School	7.0%	1.4%
High School	75.5%	70.7%
College	17.5%	27.9%
Marital Status		
Married	63.8%	62.6%
Not Married	36.2%	37.4%

Table 40 (continued)

Variable	Research Study: Rand (1979) N=3148	Research Study: Newsome (1986) N=562
Rank		
E1-E4	49.4%	41.6%
E5-E6	26.2%	25.8%
E7-E9	9.1%	10.3%
O1-O3	10.0%	16.2%
O4-O6	5.3%	6.1%
Drinking Frequency		
None	26.0%	18.0%
1-3 Times a Month	29.0%	39.7%
1-2 Times a Week	23.0%	27.0%
3-4 Times a Week	12.0%	10.0%
5-over 5 Times a Week	10.0%	5.3%

especially important since classifications of respondents were partly based on self-report of alcohol related incidents. Since the responses were anonymous no direct means existed to validate individuals' self-reports of having experienced or not having experienced a specific alcohol related incident. As an indirect means to examine the self-reports of alcohol related incidents, this study's results were compared to the self-report results obtained by the Rand study (Polich & Orvis, 1979) (see Table 41). In general, the distributions of the frequencies along various intervals of occurrence were similar for the two samples. This result supports the reliability and the generalizability of this study's self-reports of alcohol related incidents.

An additional means to examine the self-reports of alcohol related incidents, as well as the distribution of individuals along several variables, involved examining the proportion of individuals identified as problem drinkers by this study as compared to the Rand study (Polich & Orvis, 1979). This examination was considered especially relevant to the self-reports of alcohol related incidents since the reports were used for making the classification of "problem drinker". Comparison of the distributions of the frequencies along several variables again revealed similar results (see Table 42).

Table 41

Comparison of Alcohol Related Incident Frequency Data From Studies of Random Sampled Active Duty Air Force Indviduals

Alcohol Related Incident	Frequency of Incident In Past Year			
	Newsome N=562 / (Rand) N=3148			
	Never	Not In Past Year	1 Time	+1 Time
Judicial or Non-Judicial Punishment	94.1 (95.5)	4.3 (2.5)	1.6 (1.2)	0 (0.7)
Lower Performance Evaluation	97.2 (96.7)	2.5 (1.7)	0.4 (1.0)	0 (0.5)
Illness	96.6 (97.7)	1.4 (1.1)	2.0 (0.5)	0 (0.7)
Accident: Others Injured	96.8 (94.2)	2.7 (3.9)	0.5 (1.2)	0 (0.7)
Spouse Threatened To Leave	95.9 (98.5)	2.5 (0.8)	1.6 (0.4)	1.3 (0.3)
Spouse Left	99.2 (97.4)	0.4 (2.0)	0.4 (0.1)	0 (0.5)
Driving While Intoxicated	94.5 (94.5)	4.3 (3.6)	1.2 (1.2)	0 (0.6)
Non-Driving Related Arrest	96.1 (95.5)	3.2 (3.2)	0.7 (0.6)	0 (0.7)

Table 42

Comparison of Alcohol Problem Rates

By Background Characteristics on Data From Studies

of Random Sampled Active Duty Air Force Individuals

Variable	Drinking Category: % Problem Drinker (Rand)	% Non-Problem Drinker	% Non-Drinker	N
Age				
18-20	23 (19)	58	19	38
21-24	14 (18)	79	7	188
25-30	10 (12)	81	9	166
31-60	0 (8)	88	12	170
Sex				
Male	9 (14)	82	9	464
Female	8 (8)	78	14	98
Marital Status				
Not Married	16 (20)	77	7	196
Married	5 (10)	83	12	365
Education				
Non-High Sch.	0 (22)	100	0	8
High School	11 (16)	79	10	397
College	4 (7)	86	10	157

Table 42 (continued)

Variable	Drinking Catagory: % Problem Drinker (Rand)	% Non-Problem Drinker	% Non-Drinker	N
Rank				
E1-E4	15 (18)	74	11	234
E5-E6	10 (13)	80	10	145
E7-E9	0 (8)	91	9	58
O1-O3	3 (5)	88	9	91
O4-O6	0 (3)	88	12	34
Marital Accompany Status				
Not Married	16 (20)	77	7	197
With Spouse	4 (10)	85	11	348
Not With Spouse	33 (20)	54	13	15

A notable difference between the two samples was the absence of any individuals 31 years old or older who were classified as problem drinkers in this study's sample. The Rand study (Polich & Orvis, 1979) found that approximately 8% of the individuals in this age group could be classified as problem drinkers. It is certainly possible that the finding in this study of no problem drinkers in this age group is the result of underreporting by respondents. An alternate possible explanation for a lower rate, although certainly not a zero rate, in the mid-1980s as compared to the mid-1970s could be attributed to more severe action taken with individuals involved in alcohol related incidents since changes in Air Force Regulation 30-2 in the early 1980s. It is possible that the retention in the Air Force of senior individuals involved in alcohol related incidents has decreased since the changes in Air Force Regulation 30-2 requiring mandatory referral and evaluation of individuals involved in alcohol related incidents.

The primary other difference between the two studies was again related to the proportion of individuals with less than a high school education. With these differences noted, it appeared that the distribution of problem drinking individuals in the two studies was basically similar. This result also supports the reliability and generalizability of this study's self-reports of alcohol related incidents.

A 1985 study by Allen and Mazzuchi of drinking behavior provided another means to examine this study's self-reports regarding alcohol consumption. The Allen and Mazzuchi (1985) study reported results of the 1982 Worldwide Survey of Drug and Alcohol Use Among Military Personnel conducted by Research Triangle Institute. Comparison between this study's results and the results reported by Allen and Mazzuchi (1985) of the percentage of personnel who had consumed alcohol in the past 30 days indicated similar trends (see Table 43). Along each rank, the percentage of Air Force individuals who reported alcohol consumption was lower in this study than the percentages reported by Allen and Mazzuchi (1985). The magnitude of these differences ranged from 9 to 2 percentage points. With similarity in the overall trend and total percentage for all ranks (86% for Allen and Mazzuchi [1985] compared to 82% for this study), the reliability and generalizability of this study's self-reports of alcohol consumption appeared to be supported.

One of the measurement instruments utilized in this study provided an additional means to examine the generalizability of the results. The perspective for this comparison was that results from this study that were similar to previous results using the instrument would provide additional support for the reliablity and

Table 43

Comparison of Percentage of Personnel Who Had Consumed Alcohol in the 30 Days Prior to the Survey From Studies of Sampled Active Duty Military Individuals

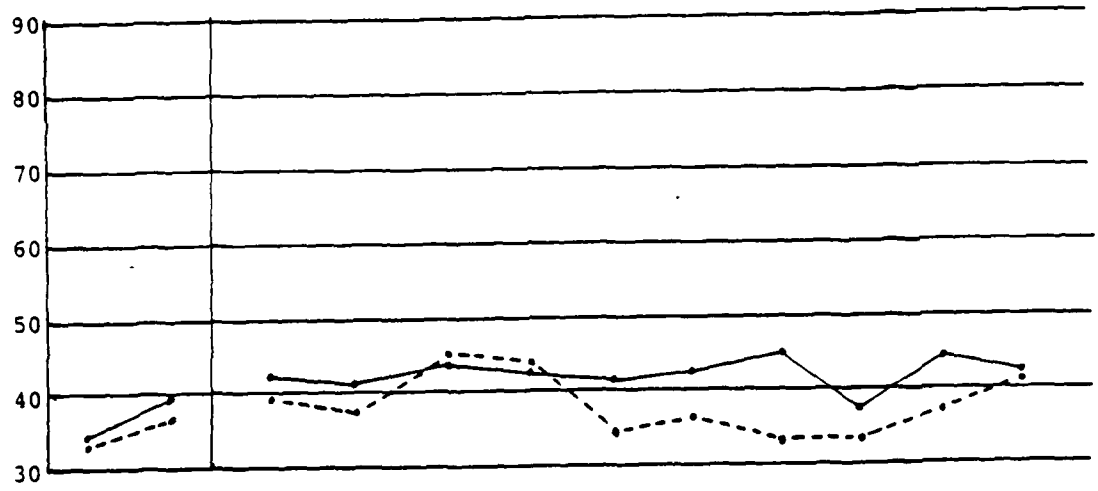
	Research Study				
	Allen & Mazzuchi (1985) N=21,936				Newsome (1986) N=562
Military Rank	Army	Navy	Marine Corps	Air Force	Air Force
E1-E5	87	80	83	85	82
E6-E9	83	81	82	85	76
O1-O3	90	89	84	91	89
O4-O6	92	94	100	90	85
Total	86	81	83	86	82

generalizability of this study's results. Zaccaria and Weir (1967) administered the POI to seventy individuals diagnosed as alcoholic who were participating in an alcoholic treatment program. All of the mean POI scores for their sample were significantly lower than the original validating, clinically nominated, self-actualizing sample. Mean POI scores were computed for this study's individuals diagnosed as alcoholic (n = 121) in order to make a comparison with Zaccaria and Weir's (1967) results. Figure 9 displays the results of this comparison. Considering the possible range of scores on each subscale, the plot lines for the two studies are quite similar. This result supports the reliability and generalizability of the POI scores obtained from this study's individuals diagnosed as alcoholic.

After considering the various comparisons between this study's results and previously obtained results from other studies of: 1) individuals admitted to an ARC, 2) randomly sampled active duty Air Force members, 3) active duty military members in general, and 4) results on an instrument by comparable groups; it appears that the results obtained by this study are representative of active duty Air Force members. From the combination of comparable results, it appears that generalizing this study's results to active duty Air Force members can be justified.

Zaccaria & Weir (1967) n=70 : ———

Newsome (1986) n=121 : ----------



	TC	I	SAV	Ex	Fr	S	Sr	Sa	Nc	Sy	A	C
m	13.3	72.9	17.7	17.2	13.4	9.1	9.6	13.8	11.4	5.9	14.2	15.9
sd	2.9	8.6	2.2	3.9	2.7	2.3	2.9	2.7	1.9	1.4	2.7	3.7

From Zaccaria and Weir (1967)

m	13.1	69.3	17.0	15.6	13.6	9.2	8.0	11.4	9.0	5.2	12.0	15.4
sd	3.0	8.3	2.3	3.1	2.7	1.9	1.8	2.6	1.6	1.3	2.5	3.4

From Newsome (1986)

Figure 9. Comparison of mean scores on the POI from samples of alcoholic individuals.

Note. TC = Time Competence, I = Inner Direction, SAV = Self Actualizing Value, Ex = Existentiality, Fr = Feeling Reactivity, S = Spontaneity, Sr = Self-regard, Sa = Self-acceptance, Nc = Nature of Man, Sy = Synergy, A = Acceptance of Aggression, and C = Capacity for Intimate Contact.

From the initiation of this study, it was planned that generalization of the results would be targeted to active duty Air Force members. Whether this is the specific limit of possible generalization of the study's results is a question which is dependent on how representative active duty Air Force members are of any larger group for which they may be considered a subgroup. The most obvious group to consider possible extension of generalization would be all active duty military members. Previous research (Polich & Orvis, 1979) indicated that individuals in the various branches of the military have more characteristics in common than characteristics in which they differ. Extrapolation of this concept to this research is possible, although at this time there is no specific empirical evidence to support this. From a theoretical perspective, no particular aspect unique to the United States Air Force was included in the development of theory regarding control discrimination accuracy. Utilization of the Air Force as the study population was based on potential for contribution and accessibility. From a theoretical perspective, similar results could have been achieved with other groups in which a contrast between individuals diagnosed as alcoholic and non-problem drinkers could be made.

A case can be made for limiting generalization of this study's results to a general population which would have a

normal distribution of demographic variables. As reflected in previous tables, the mean educational level, sex proportion, and age proportion of this study's sample are not representative of the distribution of these variables in the general population. The mean education level of the sample, 13.8 years of completed education, does not reflect the proportion of non-high school graduates in the general population. The 17.4% proportion of females in the sample does not represent their proportion in the general population. The mean age of the sample, 28.2 years old, is heavily skewed toward individuals in their 20s and away from individuals over 60 years of age. Taking into consideration the theoretical and representational issues discussed, it is recommended that any generalization of the results be restricted to active duty Air Force members until replication of the results can be demonstrated.

CHAPTER X

DISCUSSION, LIMITATIONS, IMPLICATIONS AND RECOMMENDATIONS

Discussion

This study began with an interest in the relationship between individuals' ability to accurately discriminate between what is and is not within their control and individuals' drinking behavior. From this interest, a theoretical perspective for classifying control discriminations was developed. It was argued that as a construct, control discrimination accuracy might have superior utility compared to locus of control as a construct for characterizing individuals who abuse alcohol. Previous research using the locus of control construct to characterize alcoholics had been "confusing and contradictory" (Stafford, 1980, p. 300).

A means was developed to measure the proposed theoretical perspective for control discrimination accuracy. Examination of the newly developed instruments indicated acceptable reliability ranging from .77 for the ECDA scale to .84 for both the ICDA and TCDA scales. Adequate content, discriminate, construct, and factorial

validity were also obtained to allow the researcher to confidently use the instruments for assessment of group differences in control discrimination accuracy.

The initial research hypothesis addressed basic issues related to the developed theoretical perspective that there would be a difference between the measured control discrimination accuracy of individuals diagnosed as alcoholic and a random sample of individuals from the sample that the diagnosed as alcoholic individuals were obtained. The other initial research hypothesis proposed that the difference in group control discrimination accuracy would be in a direction such that problems with alcohol would be negatively correlated with accurate control discrimination. Both of the initial research hypotheses were supported. One-way analyses of variance indicated statistically significant differences at the $p<.001$ level between the measured control discrimination accuracy of the individuals diagnosed as alcoholic and the randomly sampled individuals. The correlations between the individuals diagnosed as alcoholic and each of the control discrimination accuracy scales were in the negative direction.

Confirmation of the initial hypotheses provided a basis for further examination of a relationship between alcohol abuse and control discrimination accuracy. statistically

significant group differences identified by analyses of variance were examined for substantively significant differences through hierarchical regression analyses. Even with the more stringent variable retention requirements of hierarchical regression analysis, control discrimination accuracy, across a variety of formats for examining the construct, was demonstrated to account for the greatest proportion of explained variance in drinking status. The demographic and drinking behavior variables with the highest obtained correlations with variance in drinking status did not account for the proportion of variance accounted for by control discrimination accuracy. Taking the variety of formats utilized to examine control discrimination accuracy into consideration, the obtained hierarchical regression equations including demographic, drinking behavior, and control discrimination accuracy variables ranged from .36 to .44 in the proportion of explained variance between individuals diagnosed as alcoholic and individuals classified as non-problem drinkers.

An issue to consider is how substantive is .36 to .44 in explaining variance in drinking status in the United States Air Force. The results of the Rand Study (Polich & Orvis, 1979) of drinking behavior in the United States Air Force provides a medium for comparison. The previously discussed alcohol problem development model conceptualized

by Rand (Polich & Orvis, 1979) looked at a combination of alcohol consumption, intoxication, drinking motivation, and alcohol related incident variables in relation to alcohol dependence or non-dependence. The regression analysis of the variables obtained an R^2=.47. Although higher than the coefficients of determination obtained by this research, the results are basically similar.

It can be argued that closer examination of the Rand model and this study's model indicates different potential utilities for intervention. The coefficient of determination obtained by the Rand Study included variables directly related to alcohol consumption. The results indicated that individuals who drink a lot, frequently drink a lot, experience intoxication, and experience alcohol related incidents are more likely to have problems with alcohol than individuals who measure at low levels of these variables. It should suffice to state that this result is not surprising, but instead, confirmation of what would be expected.

The primary avenue for intervention provided by the Rand set of variables is to quit drinking. The logical conclusion would be a decrease in the level of each of the predictor variables. A limitation, proposed by this researcher, of the Rand model is that it provides no means for addressing change in drinking behavior. It can be

argued that the set of variables included in this study offers greater guidance for addressing change in drinking behavior.

Since the variable of alcohol related incidents was used in this study for classifying groups, it was not possible, as in the Rand Study, to use alcohol related incidents as a predictor variable. The extent that a variable of alcohol related incidents would have improved the study's proportion of explain d variance can only be postulated. With other things being equal, the Rand Study found an individual was 17% more likely to be alcohol dependent than not alcohol dependent if he or she has experienced an alcohol related warning incident. The format of the presentation of the Rand data limits interpretation of the change in the coefficient of determination accounted for by the variable of alcohol related incidents.

The assessment potential of the control discrimination accuracy construct was also examined. The development of cutting scores for each of the three control discrimination accuracy scales provided the opportunity to assess the potential for the scales to function as screening instruments. Analysis revealed that converting the scale scores to CDA-Type classification provided a potential screening instrument for identifying individuals at risk for alcohol abuse based on the obtained results indicating a

relationship between control discrimination accuracy and alcohol abuse. The CDA-Type classification procedure provided the most conservative approach for screening utility since assessments would only be made regarding individuals classified in the extreme categories of control discrimination accuracy. Evaluation of CDA-Type classification with a hypothetical screening sample of 10,000 individuals indicated a very low false negative rate of .8% and a false positive rate of 15%. In general, the CDA-Type screening approach suggested potential utility for the control discrimination accuracy scales to function as an adjunct with other assessment modalities, behavioral and clinical, in identifying individuals who do have problems with alcohol abuse as individuals at high risk for alcohol abuse.

The assessment potential of the control discrimination accuracy construct was also examined through discriminate analyses. After collapsing the identified subgroups of the sample into two subgroups of individuals classified by the Air Force as having problems with alcohol and individuals classified as non-problem drinkers, discriminant analyses including demographic, drinking behavior, and control discrimination accuracy variables revealed group prediction accuracy rates clearly above a rate based on chance alone. The greatest improvement in group prediction accuracy was

made by the control discrimination accuracy variables. The discriminant analyses results, combined with the examination of developed the cutting scores developed for the control discrimination accuracy scales, suggested potential value for future research to examine the performance of the scales in an actual setting where such classifications are performed. The discriminant analysis of the "test group" of random sampled individuals classified as problem drinkers indicated promising potential for the control discrimination accuracy scales, in combination with demographic and drinking behavior variables, to function as useful instruments in an actual practice setting.

The inclusion of a locus of control instrument, LODP (Stafford, 1980), in the survey provided an opportunity to make a preliminary assessment of the construct divergence between control discrimination accuracy and locus of control. Correlational and regression analysis results were consistent with the theoretical perspectives that had been developed regarding contrasts between control discrimination accuracy and locus of control. The results indicated potential advantages over locus of control for using control discrimination accuracy to characterize individuals who abuse alcohol.

Limitations of the Study

This study included the tasks of theoretical development of a new construct, development of new measures with adequate reliability and validity to measure the construct, and application of the measures to assess the utility of the construct. The adequacy of a study with all of these steps linked together is dependent on how well each of the steps preceding the next were accomplished. At this point, there appears to be conceptual consistency between the theoretical, measurement, and application aspects of control discrimination accuracy as a new construct. The accuracy of this apparent consistency cannot be tested by this study. This is the critical limitation of this study. Until the results of this study can be replicated across similar groups and different groups with similar and different instruments, it would be premature to proclaim control discrimination accuracy as a new construct with demonstrated use in furthering understanding and efforts at modification of human behavior.

With self-report as the only modality of measurement, this study primarily relied on similarity in results to previous self-report measures of the same population as its basis for generalizabilty. Although the comparisons supported a position that the study's sample was

representative of individuals in the Air Force, the unimethod approach of this study cannot discount the possibility for variation in results that could have occurred by employing observational and physiological methods to validate and expand on the obtained results.

As a cross-sectional survey study, rather than a longitudinal study, the causal relationships in this study have been assumed based on the control discrimination accuracy theoretical perspective. Control discrimination accuracy was examined as an independent variable in relation to drinking status as a dependent variable. This theoretical relationship cannot be empirically supported by this cross-sectional survey. Although difference in control discrimination accuracy has been correlated in a consistently systematic way with drinking status, at this point it can only be argued that variance in control discrimination accuracy plays an important role in variance in drinking status, rather than that variance in drinking status plays a central role in variance of control discrimination accuracy.

Implications for Social Work

As a newly developed construct, control discrimination accuracy's potential contribution to social work is difficult to predict. The results of this study indicate

potential applicability of the control discrimination accuracy construct to the field of alcohol abuse rehabilitation. As a skill based construct, control discrimination appears to have applicability to assessment and intervention.

It may be that control discrimination accuracy has broader applicability to social work theory and practice than just to the field of alcohol abuse rehabilitation. With "person-in-environment" as a central tenet of social work (Briar, 1981), the conceptualization of the control discrimination accuracy construct with its Control Discrimination Accuracy Typology may be a potentially valuable way to view the relationship between the individual and the environment. The Control Discrimination Accuracy Typology addresses the relationship between the individual and the environment. With emphasis on the individual being in control of the elements of the internal domain of behavior, thought, and affect, the role of the environment becomes one of not determining the individual's behavior, thoughts, and feelings but rather the source for the cognitive representations of the environment to which the human organism primarily responds (Mahoney, 1977).

Contrary to a view of the individual passively dealing with the environment, the non-deterministic role of the environment contained in the control discrimination accuracy

construct provides a means for the individual to take action regarding environmental conditions by exercising control over the elements within the individual's domain of control: his or her actions, words, thoughts, and feelings. Rather than viewing control of the behaviors, thoughts, and feelings of others as the avenue for environmental change, the individual through application of the Control Discrimination Accuracy Typology can interact with the environment in the spirit of Niebuhr's prayer:

> O, God, Give us the serenity to accept what cannot be changed, courage to change what should be changed, and wisdom to distinguish one from the other.

The individual need not view his or her actions, thoughts, and feelings as determined by others, but rather view himself or herself as free to determine his or her own actions, thoughts, and feelings. The individual need not passively view the environment as unchangeable, but rather, identify that he or she has the potential to exercise the elements within his or her internal domain of control to have an effect on the environment, with recognition that the outcome of the elements in the environment may not be ultimately within his or her control. The "serenity to accept" need not imply passive acceptance of undesirable conditions, but instead, reflect "wisdom" focused on the acceptance of one's limitations with application of the

"courage" to try to affect desired change.

Recommendations

It is recommended that future research examine the relationship between control discrimination accuracy and other variables of interest. Although this research has addressed the relationship between control discrimination accuracy and alcohol abuse, control discrimination accuracy theory was not designed to be specifically related to alcohol abuse alone. The subject of alcohol abuse was chosen as a problem area where it was hypothesized that examination of control discrimination accuracy might be able to make a contribution to further understanding. It would seem that future research could address potential relationships between control discrimination accuracy and other problem areas of interest such as anxiety disorders, depressive disorders, and compulsive disorders.

Further examination of the relationship between the constructs of locus of control and control discrimination accuracy appears to be warranted by the preliminary results of this research. This future examination could include direct comparison of locus of control and control discrimination accuracy as constructs for explaining variance in drinking status and as assessment instruments for identifying individuals who are at risk for alcohol

abuse.

It is also recommended that future research specifically address the directionality of the relationship between control discrimination accuracy and alcohol abuse. The outcome of such research might function to further establish the role that problems with control discrimination accuracy plays in alcohol abuse.

REFERENCES

References

Abramson, L. Y., Seligman, M. E. P., & Teasdale, J. (1978). Learned helplessness in humans: Critique and reformulation. Journal of Abnormal Psychiatry, 87, 49-74.

Allen, J., & Mazzuchi, J. (1985). Alcohol and drug abuse among American military personnel. Alcohol Health and Research World, 10(2), 16-21.

American Psychiatric Association (1980). Diagnostic and statistical manual of mental disorders (3rd ed.). Washington, D.C.: Author.

Appel B., & Kaestner, L. (1979). Interpersonal and emotional problem solving among narcotic drug abusers. Journal of Consulting and Clinical Psychology, 47, 1125-1127.

Armor, D. J., Polich, J. M., & Stambul, H. B. (1978). Alcoholism and treatment. New York: John Wiley and Sons.

Averill, J. R. (1973). Personal control over aversive stimuli and its relationship to stress. Psychological Bulletin, 80, 286-303.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review, 84, 191-215.

Bingham, J. (1961). Courage to change: An introduction to the life and thought of Reinhold Niebuhr. New York: Charles Scribner's Sons.

Blij, K. D., & Hinrichsen, J. J. (1980). Construct validity of Rotter's locus of control scale in men alcoholics. Journal of Studies on Alcohol, 41, 463-475.

Briar, S. (1981). Needed: A simple definition of social work. Social Work, 26, 83-84.

Buros, O. K. (Ed.) (1978). The eighth mental measurements yearbook. Highland Park, NJ: Gryphon Press.

Butts, S. V., & Chotlos, J. A. (1973). A comparison of alcoholics and nonalcoholics on perceived locus of control. Journal of Studies on Alcohol, 34, 1327-1332.

Cahalan, D., & Room, R. (1974). Problem drinking among American men. New Brunswick, New Jersey: Rutgers Center of Alcohol Studies.

Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. Psychological Bulletin, 56, 81-105.

Cattell, R. B. (1966). The scree test for the number of factors. Multivariate Behavioral Research, 1(2), 245-276.

Coan, R. W. (1972). Review of the Personal Orientation Inventory. In O. K. Buros (Ed.), The seventh mental measurements yearbook (pp. 292-294). Highland Park, NJ: Gryphon Press.

Cohen, J., & Cohen, P. (1983). Applied multiple regression/correlation analysis for the behavioral sciences (2nd ed.). Hillsdale, New Jersey: Lawrence Erlbaum Associates, Publishers.

Collins, B. E., Martin, J. C., Ashmore, R. D. & Ross, L. (1973). Some dimensions of the internal-external metaphor in theories of personality. Journal of Personality, 41, 471-492.

Comptroller General of the United States (1980). Substantial cost savings from establishment of alcoholism programs for Federal civilian employees. Report to the Special Subcommittee on Alcoholism and Narcotics, Committee on Labor and Public Welfare, U. S. Senate. Washington D.C.: U.S. Government Printing Office.

Craighead, W. E., Kazdin, A. E., & Mahoney, M. J. (1981). Principles, issues, and applications (2nd ed.). Boston: Houghton Mifflin Company.

Donovan, D. (1978). The drinking related locus of control scale: Reliability, factor structure, and validity. Journal of Studies on Alcohol, 39, 759-784.

Donovan, D. M., & O'Leary, M. R. (1983). Control orientation, drinking behavior, and alcoholism. Research with the locus of control construct (Volume 2): Developments and social problems. New York: Academic Press, Inc.

Downie, N. M., & Heath, R. W. (1967). Basic statistical methods. New York: Harper and Row.

Erhard, W. (1976). What is the purpose of est training? San Francisco: Erhard Training Seminars.

Fisher, G., & Silverstein, A. (1969). Self-actualization values of felons. Journal of Humanistic Psychology, 9, 66-70.

Flavell, H. H. (1963). The developmental psychology of Jean Piaget. Princeton, New Jersey: Van Nostrand.

Fox, J., Knapp, R. R., Micheal, W. B. (1968). Assessment of self-actualization of psychiatric patients: Validity of the Personal Orientation Inventory. Educational and Psychological Measurement, 28, 565-569.

Goss, A., & Morosko, T. E. (1970). Relation between a dimension of internal-external control and the MMPI with an alcoholic population. Journal of Consulting Clinical Psychology, 34, 189-192.

Gozali, J., & Sloan, J. (1971). Control orientation as a personality dimension among alcoholics. Journal of Studies on Alcohol, 32, 159-161.

Haber, R. N., & Hershenson, M. (1973). The psychology of visual perception. New York: Holt, Rinehart, and Winston.

Hauge, C. F. (1979). Description and evaluation of centralized alcohol rehabilitation programs, United States Air Force. Dissertation Abstracts International, 40, 3535A-3536A.

Heider, F. (1944). Social perception and phenomenal causality. Psychological Review, 51, 358-374.

Helmstadter, G. C. (1964). Principles of psychological measurement. New York: Appleton-Century-Crofts.

Hinrichsen, J. J. (1976). Locus of control orientation among alcoholics; some empirical and conceptual issues. Quarterly Journal of Studies on Alcohol, 37, 908-916.

Horn, J. L., & Wanberg, K. W. (1970). Dimension of current and background patterns found among excessive drinkers. Journal of Studies on Alcohol, 31, 633-658.

Hudson, W. W. (1982). The clinical measurement package: A field manual. Homewood, Illinois: Dorsey Press.

Ilardi, R. L., & May, W. T. (1968). A reliability study of Shostrom's Personal Orientation Inventory. Journal of Humanistic Psychology, 8, 68-72.

Intagliatia, R. (1978). Increasing the interpersonal problem-solving skills of an alcoholic population. Journal of Consulting and Clinical Psychology, 46, 489-498.

Kerlinger, F. N. (1973). Foundations of behavioral research (2nd ed.). New York: Holt, Rinehart, and Winston, Inc.

Klavetter, R. E., & Mogar, R. E. (1967). Stability and internal consistency of a measure of self-actualization. Psychological Reports, 21, 422-424.

Knapp, R. R. (1976). Handbook for the POI. San Diego: EdITS Publishers.

Lang, A. R. (1983). Addictive personality: A viable construct? In P. K. Levison, D. R. Gerstein, and D. R. Maloff (Eds.). Commonalities in substance abuse and habitual behavior. Lexington, Massachusetts: Lexington Books.

Lefcourt, H. M. (1972). Recent developments in the study of locus of control. In B. A. Maher (Ed.), Progress in experimental personality research (Volume 6). New York: Academic Press, Inc.

Lefcourt, H. M. (1982). Locus of control: Current trends in theory and research. Hillsdale, New Jersey: Lawrence Erlbaum Associates, Publishers.

Levenson, H. (1981). Differentiating among internality, powerful others, and chance. In H. M Lefcourt (Ed.), Research with the locus of control construct (Volume 1): Assessment methods. New York: Academic Press, Inc.

Lindesmith, A. R., & Strauss, A. L. (1968). Social Psychology. New York: Holt, Rinehart, and Winston.

Mahoney, M. J. (1977). Reflections on the cognitive-learning trend in psychotherapy. American Psychologist, 32, 5-13.

Marlatt, G. A. (1979). Alcohol use and problem drinking: A cognitive-behavioral analysis. In P. C. Kendall & S. D. Hollon (Eds.), Cognitive behavioral interventions: Theory, research, and procedures. New York: Academic

Press, Inc.

Marlatt, G. A., & Donovan, D. M. (1981). Alcoholism and drug dependence: Cognitive social-learning factors in addictive behaviors. In W. E. Craighead, A. E. Kazdin, & M. J. Mahoney (Eds.), Behavior modification: Principles, issues, and applications. Boston: Houghton Mifflin Company.

Marsh, R. M. (1979). Alcohol abuse programs in the military. Health and Social Work, 4(4), 61-83.

Maultsby, M. C. (1978). A million dollars for your hangover. Lexington, KY: Rational Self-help Books.

Maslow, A. H. (1971). The farther reaches of human nature. New York: Viking Press.

May, R., Angel, E., & Ellenberger, H. (1958). Existence. New York: Basic Books.

McClain, E. (1970). Further validation of the POI: Assessment of self-actualization of school counselors. Journal of Consulting and Clinical Psychology, 35, 21-22.

McConnell, J. V. (1974). Understanding human behavior. New York: Holt, Rinehart, and Winston.

McWilliams, J., Brown, C. C., & Minard, J. G. (1975). Field dependence and self actualization in alcoholics. Journal of Studies on Alcohol, 36, 387-394.

Merten, R. (1946). Mass persuasion. New York: Harpers.

Mischel, W. (1973). Toward a cognitive social learning reconceptualization of personality. Psychological Review, 80, 252-283.

Myers, S. S. (1983). Alcohol rehabilitation in the USAF. Medical Service Digest, 35(5), 21-23.

Nunnally, J. C. (1978). Psychometric theory. New York: McGraw-Hill Book Company.

O'Brien, G. E. (1984). Locus of control, work, and retirement. In H. M. Lefcourt (Ed.), Research with the locus of control construct (Volume 3): Extensions and limitations. New York: Academic Press, Inc.

Oziel, L. J., & Obitz, F. W. (1975). Control orientation in

alcoholics related to extent of treatment. Journal of Studies on Alcohol, 36, 158-161.

Paulhus, D., & Christie, R. (1981). An interactionist approach to assessment of perceived control. In H. M. Lefcourt (Ed.), Research with the locus of control construct (Volume 1): Assessment methods. New York: Academic Press, Inc.

Perls, F. (1947). Ego, hunger, and aggression. London: George Allen and Unwin, Limited.

Perls, F., Hefferline, R., & Goodman, P. (1951). Gestalt therapy. New York: Julian Press.

Polich, J. M., & Orvis, B. R. (1979). Alcohol problems: Patterns and prevalence in the U. S. Air Force. Santa Monica, CA: Rand Corporation.

Reid, D. W., & Ziegler, M. (1981). The desired control measure and adjustment among the elderly. In H. M. Lefcourt (Ed.), Research with the locus of control construct (Volume 1): Assessment methods. New York: Academic Press, Inc.

Riesman, D., Glazer, N., & Denney, R. (1950). The lonely crowd: A study of the changing American character. New Haven: Yale University Press.

Rohsenow, D. J., & O'Leary, M. R. (1978). Locus of control research on alcoholic populations: A review. I: Development, scales, and treatment. The International Journal of the Addictions, 13, 55-78.

Ross, L. (1977). The intuitive psychologist and his shortcomings: Distortions in the attribution process. In L. Berkowitz (Ed.), Advances in experimental social psychology (Volume 10). New York: Academic Press, Inc.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs, 80, 1, Whole No. 609.

Rotter, J. B. (1975). Some problems and misconceptions related to the construct of internal versus external control of reinforcement. Journal of Consulting and Clinical Psychology, 43, 56-67.

Sandbach, F. H. (1975). The stoics. New York: Norton.

Seligman, M. E. P. (1974). Depression and learned

helplessness. In R. J. Friedman & M. M. Katz (Eds.), The psychology of depression: Contemporary theory and research. Washington, DC: Winston.

Shostrom, E. L. (1976). Actualizing therapy: Foundations for a scientific ethic. San Diego: EdITS Publishers.

Shostrom, E. L. (1964). An inventory for the measurement of self-actualization. Educational and Psychological Measurement, 24, 207-218.

Shostrom, E. L. (1973). Comment on a test review: The Personal Orientation Inventory. Journal of Counseling Psychology, 20, 479-481.

Stafford, R. A. (1980). Alcoholics' perception of the internal-external locus of their drinking problem. Journal of Studies on Alcohol, 41, 300-309.

Stafford, R. A. (1982). Locus of drinking problems as perceived by alcoholics and treatment personnel. Journal of Studies on Alcohol, 43, 593-598.

Strickland, B. R. (1978). Internal-external expectancies and health-related behaviors. Journal of Consulting and Clinical Psychology, 46(6), 1192-1211.

Sutherland, E. H., Schroeder, H. G., & Tordella, C. L. (1950). Personality traits and the alcoholic, A critique of existing studies. Journal of Studies on Alcohol, 11, 547-561.

Syme, L. (1957). Personality characteristics and the alcoholic, A critique of current studies. Journal of Studies on Alcohol, 18, 288-302.

Thevenaz, P. (1962). What is phenomenology? New York: Quadrangle.

Tiffany, D. W. (1967). Mental health: A function of experienced control. Journal of Clinical Psychology, 23, 311-315.

Tiffany, D. W., Salkin, G. G., & Cowan, J. R. (1970). Generalized expectancies for control of reinforcements compared to experienced control. Journal of Clinical Psychology, 26, 519-520.

Tiffany, D. W., Schontz, F. C., & Woll, S. B. (1969). A model of control. Journal of General Psychology, 81, 67-82.

Wall, J. (1975). Relationship of locus of control to self actualization. Psychological Reports, 27, 282.

Wall, J. H. (1936). A study of alcoholism in men. American Journal of Psychiatry, 92, 1390-1401.

Weiner, B., Frieze, I., Kukla, A., Reed, L., Rest, S., Rosenbaum, R. M. (1971). Perceiving the causes of success and failure. In E. E. Jones, D. E. Kanouse, H. H. Kelley, R. E. Nisbet, S. Valins, & B. Weiner (Eds), Attribution: Perceiving the causes of behavior. Morristown, New Jersey: General Learning Press.

Weir, W. R., & Gade, E. M. (1969). An approach to counseling alcoholics. Rehabilitation Counseling Bulletin, 12, 227-230.

Wise, G. W., & Davis, J. E. (1975). The Personal Orientation Inventory: Internal consistency, stability, and sex differences. Psychological Reports, 36, 847-855.

Wong, P. T., & Sproule, C. F. (1984). An attribution analysis of the locus of control construct and the Trent Attribution Profile. In H. M. Lefcourt (Ed.), Research with the locus of control construct (Volume 3): Extensions and limitations. New York: Academic Press, Inc.

Wong, P. T., Watters, D. A., & Sproule, C. F. (1978). Initial validity and reliability of the Trent Attribution Profile (TAP) as a measure of attribution schema and locus of control. Educational and Psychological Measurement, 38, 1129-1134.

Wortman, C. B., & Brehm, J. W. (1975). Responses to uncontrollable outcomes: An integration of reactance theory and the learned helplessness model. In L. Berkowitz (Ed.), Advances in experimental social psychology (Volume 8). New York: Academic Press, Inc.

Zaccaria, J. S., & Weir, W. R. (1967). A comparison of alcoholics and selected samples of nonalcoholics in terms of a positive concept of mental health. Journal of Social Psychology, 71, 151-157.

APPENDIX A

LEAD LETTERS AND COVER LETTERS

FOR THE RANDOM SAMPLE SURVEY

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 3901ST AIR BASE GROUP AFSC
EGLIN AIR FORCE BASE, FLORIDA 32542-5000

Dear Air Force Active Duty Member,

You have been selected on a random basis to participate in a research project goaled toward enhancing alcohol abuse rehabilitation in the United States Air Force. Within the next five days you will be receiving a questionnaire for you to complete. Your participation is voluntary but will be valuable in contributing to knowledge about the beliefs and attitudes of Air Force members.

This research project has been approved by the Air Force with the provision of a Survey Control Number (USAF SCN 85-77) from Air Force Manpower and Personnel Center, Randolph AFB, Texas. This project is being supported by the Air Force Social Actions Office. The answers you give will be strictly confidential and will be used for research purposes only. No individual information will be given to any source inside or outside of the Air Force. The results will be used for statistical summaries only.

It will take approximately 60-90 minutes to complete the survey. It will not be necessary for you to complete all of the survey at one time, although that may be the best approach to assure completion. The survey should be completed and returned within five days in the enclosed envelope that will accompany the survey.

Regardless of your rank or duty position, YOUR responses will be important in contribuiting to a greater understanding of the beliefs and attitudes of Air Force members. Please take time to consider the contribution that you can make as an individual by responding to this survey when you receive it.

Thank you for your time and consideration.

RICHARD NEWSOME, Capt, USAF, BSC
Air Force Institute of Technology

HULON T. ROBERTS, Lt Col, USAF
Deputy Base Commander

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS [illegible] AIR BASE GROUP AFSC
[illegible] AIR FORCE BASE, FLORIDA [illegible]

Dear Air Force Active Duty Member,

You have been selected on a random basis to participate in this survey goaled toward enhancing alcohol abuse rehabilitation in the United States Air Force. Your participation is voluntary but will be valuable in contributing to knowledge about the beliefs and attitudes of Air Force members.

This survey has been approved by the Air Force (USAF SCN 85-77) and has the support of the Air Force Social Actions Office. The answers you give will be strictly confidential and will be used for research purposes only. No individual information will be given to any source inside or outside of the Air Force. The results will be used for statistical summaries only.

It will take approximately 60-90 minutes to complete the survey. It is not necessary that it be completed at one time, although that may be the best approach to assure completion of the survey. Each section of the survey has specific instructions preceding it. Please take time to carefully read them before proceeding to each new section. All responses to the first sections should be made directly on the questionnaire. Only responses for the last section (the separate booklet) should be entered on the enclosed standardized answer sheet. Please return your completed questionnaire AND the separate booklet in the enclosed envelope within five days.

If for some reason you decide not to participate in this survey, please return the survey package in the enclosed envelope. This will help to defray the cost of the survey. Before making a decision to return the survey uncompleted, please take time to consider the contribution you can make as an individual to furthering knowledge about the beliefs and attitudes of Air Force members.

Thank you for your time and consideration.

RICHARD NEWSOME, Capt, USAF, BSC
Air Force Institute of Technology

HULON T. ROBERTS, Lt Col, USAF
Deputy Base Commander

[illegible]
[illegible] THE AIR FORCE
[illegible]

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 347TH TACTICAL FIGHTER WING (TAC)
MOODY AIR FORCE BASE, GA 31699

Dear Air Force Active Duty Member

You have been selected on a random basis to participate in a research project goaled toward enhancing alcohol abuse rehabilitation in the United States Air Force. Within the next five days you will be receiving a questionnaire for you to complete. Your participation is voluntary but will be valuable in contributing to knwoledge about the beliefs and attitudes of Air Force members.

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Thank you for your time and consideration.

Joseph J. Redden
JOSEPH J. REDDEN, Colonel, USAF
Vice Commander

Ray D. N.
RICHARD D. NEWSOME, Capt, USAF, BSC
Social Work Doctoral Candidate, AFIT

Readiness is our Profession

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 347TH TACTICAL FIGHTER WING (TAC)
MOODY AIR FORCE BASE, GA 31699

Dear Air Force Active Duty Member

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Thank you for your time and consideration.

Joseph J. Redden
JOSEPH J. REDDEN, Colonel, USAF
Vice Commander

Richard D. Newsome
RICHARD D. NEWSOME, Capt, USAF, BSC
Social Work Doctoral Candidate, AFIT

Readiness is our Profession

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS USAF AIR DEFENSE WEAPONS CENTER (TAC)
TYNDALL AIR FORCE BASE FL 32403

REPLY TO
ATTN OF: CC

8 OCT 1985

SUBJECT: AFIT Sponsored Research/Survey

TO: Air Force Active Duty Member

1. You have been selected on a random basis to participate in a research project goaled toward enhancing alcohol abuse rehabilitation in the United States Air Force. Within the next five days you will be receiving a questionnaire. Your participation in completing the questionnaire is voluntary but will be valuable in contributing to knowledge about the beliefs and attitudes of Air Force members.

2. This research project has been approved by the Air Force with the provision of a Survey Control Number (USAF SCN 85-77) from Air Force Manpower and Personnel Center, Randolph AFB, Texas. This project is being supported by the Air Force Social Actions Office. The answers you give will be strictly confidential and will be used for research purposes only. No individual information will be given to any source inside or outside of the Air Force. The results will be used for statistical summaries only.

3. It will take approximately 60-90 minutes to complete the survey. It will not be necessary for you to complete all of the survey at one time, although that may be the best approach to assure completion. The survey should be completed and returned within five days in the enclosed envelope that will accompany the survey.

4. Regardless of your rank or duty position, YOUR responses will be important in contributing to a greater understanding of the beliefs and attitudes of Air Force members. Please take time to consider the contribution that you can make as an individual by responding to this survey when you receive it.

5. Thank you for your time and consideration.

RICHARD A. PIERSON, Brig. Gen., USAF
Commander

Readiness is our Profession

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS USAF AIR DEFENSE WEAPONS CENTER (TAC)
TYNDALL AIR FORCE BASE FL 32403

REPLY TO ATTN OF: CC

8 OCT 1985

SUBJECT: AFIT Sponsored Research/Survey

TO: Air Force Active Duty Member

1. You have been selected on a random basis to participate in this survey goaled toward enhancing alcohol abuse rehabilitation in the United States Air Force. Your participation is voluntary but will be valuable in contributing to knowledge about the beliefs and attitudes of Air Force members.

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3. It will take approximately 60-90 minutes to complete the survey. It is not necessary that it be completed at one time, although that may be the best approach to assure completion of the survey. Each section of the survey has specific instructions preceding it. Please take time to carefully read them before proceeding to each new section (the separate booklet) should be entered on the enclosed standardized answer sheet. Please return your completed questionnaire and the separate booklet in the enclosed envelope within five days.

4. If for some reason you decide not to participate in this survey, please return the survey package in the enclosed envelope. This will help to defray the cost of the survey. Before making a decision to return the survey uncompleted, please take time to consider the contribution you can make as an individual to furthering knowledge about the beliefs and attitudes of Air Force members.

5. Thank you for your time and consideration.

RICHARD A. PIERSON, Brig. Gen., USAF
Commander

Readiness is our Profession

APPENDIX B

RESEARCH SURVEY PACKAGE

General Information Survey

1. Please check your present active duty pay grade:

Officer	Enlisted
____ O-6	____ E-9
____ O-5	____ E-8
____ O-4	____ E-7
____ O-3	____ E-6
____ O-2	____ E-5
____ O-1	____ E-4
	____ E-3
	____ E-2
	____ E-1

2. Please indicate your present age:

___ 17 or under	___ 22-24	___ 37-39	___ 52-54
___ 18	___ 25-27	___ 40-42	___ 55-57
___ 19	___ 28-30	___ 43-45	___ 58-60
___ 20	___ 31-33	___ 46-48	___ 61-63
___ 21	___ 34-36	___ 49-51	___ 64 or over

3. Please check:

____ Male
____ Female

4. Please check the category which most accurately describes yourself:

____ American Indian
____ Black
____ Oriental American
____ Spanish background (Mexican American, Puerto Rican, Cuban, etc.)
____ White (but not Spanish background)
____ Other

5. Please check the response that describes your highest level of education NOW: (Include accepted GED)

____ No high school
____ Some high school
____ GED certificate or high school eqivilency
____ High school graduate
____ One or two years of college or vocational school (Include Associate Degree)
____ More than two years of college
____ College degree (BA, BS, or equivilent)
____ Graduate study but no graduate degree
____ Master's Degree
____ Doctor's Degree (Ph.D., M.D., LL.B., Ed.D., etc.)

6. Please indicate your marital status:

____ Married
____ Separated
____ Divorced
____ Widowed
____ Never married

7. Please check how many dependents you have: (Do not include yourself.)

____ None
____ 1 dependent
____ 2 dependents
____ 3 dependents
____ 4 dependents
____ 5 dependents
____ 6 dependents
____ 7 or more dependents

8. Is your spouse with you at your present duty station?

____ Yes, my spouse is with me
____ No, my spouse is not with me
____ I am not currently married

9. Please check the response which best indicates where you lived during MOST of the time while you were growing up, before you were 16 years old:

____ Middle Atlantic (New Jersey, New York, Pennsylvania)
____ New England (Connecticutt, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont)
____ East North Central (Illinois, Indiar , Michigan, Ohio, Wisconsin)
____ West North Central (Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota)
____ South Atlantic (Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia)
____ East South Central (Alabama, Kentucky, Mississippi, Tennessee)
____ West South Central (Arkansas, Louisiana, Oklahoma, Texas)
____ Mountain (Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming)
____ West Coast (California, Oregon, Washington)
____ Alaska, Hawaii
____ Puerto Rico, other U.S. territories
____ Europe
____ Asia
____ Pacific
____ Africa
____ Other Latin America
____ Canada
____ Other overseas location

10. When you were growing up, until about the age of 16, did your father or stepfather drink frequently or heavily?

____ Yes
____ No
____ Did not live with a father or stepfather

11. When you were growing up, until about the age of 16, did your mother or stepmother drink frequently or heavily?

____ Yes
____ No
____ Did not live with a mother or stepmother

12. Please indicate how long have you been on active duty: (If you had a break in service, count current time and time in previous tours.)

____ Less than 3 months
____ 3-6 months
____ 7-9 months
____ 10-11 months
____ 12-23 months
____ 2 years (24-35 months)
months
____ 3 years (36-47 months)
____ 4-5 years
____ 6-8 years
____ 9-11 years
____ 12-15 years
____ 16-19 years
____ 20-24 years
____ 25-30 years
____ Over 30 years

13. What type of quarters do you have at present?

____ On base with dependents
____ On base barracks or nondependent quarters
____ Off base government housing
____ Off base civilian housing

14. How long has it been since your last drink of beer, wine, or hard liquor?

____ A day
____ A week
____ A month
____ A year
____ More than a year ago
____ Never drank any beer, wine, or hard liquor

15. During the PAST MONTH, how often did you drink beer, wine, or hard liquor? (Please check)

____ Every day
____ Nearly every day
____ 3-4 times a week
____ Once or twice a week
____ 2-3 times during the past 30 days
____ Once during the past 30 days
____ Didn't drink any beer, wine, or hard liquor in the past 30 days

Below is a list of experiences that many people have reported in connection with drinking. For each experience, please mark one answer to indicate the frequency you have had this experience, if ever.

Please take your time on this, so your answers will be as accurate as possible.

	I have had this experience:				
	+2 times	2 times	1 time	not in past year	never
16. Got into a fight while drinking	____	____	____	____	____
17. Stayed away from duty because of a hangover	____	____	____	____	____
18. Drinking may have hurt my chances for a promotion	____	____	____	____	____
19. Got a lower score on efficiency report or performance evaluation because of my drinking	____	____	____	____	____
20. Received judicial punishment because of my drinking	____	____	____	____	____
21. Received non-judicial punishment because of my drinking	____	____	____	____	____

	I have had this experience:				
	+2 times	2 times	1 time	not in past year	never
22. Had an illness connected with drinking which kept me from duty	___	___	___	___	___
23. Had trouble with the law about driving after drinking	___	___	___	___	___
24. Had trouble with the law about drinking, when driving was not involved	___	___	___	___	___
25. My drinking contributed to an accident where I or someone else was hurt and/or property was damaged	___	___	___	___	___
26. I stayed intoxicated for several days at a time	___	___	___	___	___
27. My spouse threatened to leave me because of my drinking	___	___	___	___	___
28. My spouse left me because of my drinking	___	___	___	___	___

The Trent Attribution Profile

Instructions: For each of the following statements, please rate the importance of each of the five reasons according to your judgment. Please circle the appropriate number.

Note that: 5 means very important
4 means somewhat important
3 means undecided
2 means somewhat unimportant
1 means not at all important

For example, consider the following item:

One's height is the result of: Nutrition 1 2 3 4 5
Exercise 1 2 3 4 5
Parent's height . 1 2 3 4 5
Climate 1 2 3 4 5

Thus, if you believe that nutrition is very important, you would circle 5; if you believe that exercise is not important at all, you would circle 1; if you believe parent's height is somewhat important, you would circle 4; and so on.

---

1. Most scientific inventions are the result of:

   a. chance happenings 1 2 3 4 5
   b. the inventor's intellience 1 2 3 4 5
   c. easy, routine scientific work 1 2 3 4 5
   d. much time and effort by the inventor 1 2 3 4 5

2. My good marks in school were due to:

   a. easy marking by the teacher 1 2 3 4 5
   b. hard work on my part 1 2 3 4 5
   c. good luck 1 2 3 4 5
   d. my academic skills 1 2 3 4 5

3. When a person is popular, it is because:

   a. of lucky breaks 1 2 3 4 5
   b. he or she tries hard 1 2 3 4 5
   c. of their social skills 1 2 3 4 5
   d. it's easy to be popular 1 2 3 4 5

Note that: 5 means very important
4 means somewhat important
3 means undecided
2 means somewhat unimportant
1 means not at all important

4. When I did not do well in a class in school, it was because:

a. I didn't try hard enough 1 2 3 4 5
b. the teacher was very demanding 1 2 3 4 5
c. of my lack of skills in the subject area ... 1 2 3 4 5
d. of unlucky breaks 1 2 3 4 5

5. If my financial situation were to get worse, it would probably be due to:

a. difficult circumstances 1 2 3 4 5
b. my poor judgment 1 2 3 4 5
c. my unlucky breaks 1 2 3 4 5
d. my lack of effort 1 2 3 4 5

6. When people fail school, it is because:

a. lack of academic skills 1 2 3 4 5
b. bad breaks 1 2 3 4 5
c. lack of effort 1 2 3 4 5
d. harsh judgments by the teacher 1 2 3 4 5

7. Most wealthy people are rich because:

a. of their skill at making money 1 2 3 4 5
b. they worked very hard 1 2 3 4 5
c. of lucky breaks 1 2 3 4 5
d. it's easy to make money 1 2 3 4 5

8. When I have a good time at a party, it is because:

a. it was a good party 1 2 3 4 5
b. I'm a good mixer 1 2 3 4 5
c. it was a lucky day 1 2 3 4 5
d. I make an effort to have fun 1 2 3 4 5

9. My future financial success will be because:

a. of hard work on my part 1 2 3 4 5
b. of lucky breaks 1 2 3 4 5
c. of my skill to make money 1 2 3 4 5
d. it's not hard to make money 1 2 3 4 5

Note that: 5 means very important
4 means somewhat important
3 means undecided
2 means somewhat unimportant
1 means not at all important

10. When people dislike me, it is usually because:

a. I don't try hard enough to be friendly 1 2 3 4 5
b. luck isn't on my side 1 2 3 4 5
c. it's hard to be liked by anyone 1 2 3 4 5
d. I lack the social skills 1 2 3 4 5

11. Most poor people have little because:

a. of bad breaks 1 2 3 4 5
b. it's difficult to get ahead in the world ... 1 2 3 4 5
c. they don't work hard enough 1 2 3 4 5
d. of lack of financial skills 1 2 3 4 5

12. The fact that some people are not well-liked is because:

a. they don't get along with others 1 2 3 4 5
b. it's hard to be popular 1 2 3 4 5
c. they don't try to be friendly 1 2 3 4 5
d. they have had bad breaks 1 2 3 4 5

Note. Locus of Drinking Problem scale was only administered to individuals classified as having a problem with alcohol.

INSTRUCTIONS

This is a questionnaire to find out how people see their drinking and things in general. Each question has two parts: A and B. Pick the one that you more strongly believe to be what you think. Circle the letter, A or B, on the question sheet toindicate your choice.

Be sure to pick the one that you really think rather than the one that you think that you should pick. There are no right or wrong answers. Just pick the one you think best says how you think.

Sometimes you may believe both parts A and B or not believe either one. Then be sure to pick the one that you more strongly believe for you. Don't let the way you answered another question make any difference in how you answer a question.

Please answer the questions carefully, but do not spend too much time on any one item. Answer each question and go on to the next one. Be sure to answer each one.

1. A. There are certain persons who make me drink.
   B. Other persons do not make me drink.

2. A. I am generally in control of my life.
   B. I have little control over what happens to me.

3. A. I am not responsible for my drinking.
   B. Only I am responsible for my drinking.

4. A. When you get right down to it, I choose to drink.
   B. When you get right down to it, I have no choice but to drink.

5. A. I can remember my first drink.
   B. I cannot remember my first drink.

6. A. I am not responsible for the things that I do when I am drunk.
   B. I am responsible for the things that I do when I am drunk.

7. A. My drinking is my own doing.
   B. I have little control over my drinking.

8. A. I choose to do the things that I do when I am drunk.
   B. I have no choice about the things that I do when I am drunk.

9. A. I have no one to blame but myself for drinking.
   B. I am not to blame for my drinking.

10. A. Drinking was never fun for me.
    B. I've had a lot of fun drinking.

11. A. When someone offers me a drink, I find it hard to turn down.
    B. I can easily refuse a drink.

12. A. In general, I have few choices in life.
    B. I choose most of the things that happen to me.

13. A. Trouble at home or work makes me drink.
    B. I drink becasue I want to drink.

14. A. When I am drinking, I feel more relaxed.
    B. When I am drinking, I feel more tense.

15. A. I have a disease and am a sick person who is not responsible for the things I do.
    B. I am responsible for the things that I do.

16. A. I have no control over my drinking.
    B. My drinking is my own doing.

17. A. I prefer to drink alone.
    B. I prefer to drink with other people.

18. A. In the long run, I am responsible for my drinking problem.
    B. In the long run, I am not responsible for my drinking problem.

19. A. I drink because of all of my problems.
    B. My problems are largely a result of my drinking.

20. A. I am to blame for my own actions when I am drunk.
    B. I can't help the way that act when I am drunk, so I am not to blame.

21. A. Much of the time, I am capable of controlled social drinking.
    B. I am not able to any longer do controlled social drinking.

22. A. I do not choose to have a drinking problem. It is something that happened to me.
    B. I have made choices that resulted in my drinking problem

23. A. I lose control over my actions when I am drunk.
    B. I am in control of my actions when I am drunk.

24. A. I is easy for me to feel good when I haven't had a drink.
    B. I don't feel very good when I haven't had a drink.

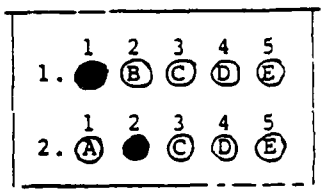
25. A. I believe that alcoholism is a disease.
    B. I believe that alcoholism is primarily a social and psychological problem.

Special Directions for the Last Section

This section consists of pairs of numbered statements. Read each statement and decide which of the two paired statements most consistently applies to you.

You are to mark your responses on the RED answer sheet enclosed in the questionnaire. Only responses for this section of the survey should go on the RED answer sheet. All other responses should be made directly on the questionnaire. Do not mark answers for this section on the Personal Orientation Inventory questionnaire.

Notice the example of the answer sheet shown at the right. If the first statement of the pair is TRUE or MOSTLY TRUE as applied to you, completely fill in the "A" circle using a #2 pencil. (See Example Item 1 at right.) If the second statement of the pair is TRUE or MOSTLY TRUE as applied to you, completely fill in the "B" circle. (See Example Item 2 at right.) Remember to give YOUR OWN opinion of yourself and do not leave any blank spaces if you can avoid it.



In marking your answers on the answer sheet, be sure the number of the statement agrees with the number on the answer sheet. Make your marks heavy and black. Erase completely any answer you wish to change. Do not make any marks in the booklet.

Remember to only make marks in the "A" and "B" circles. Do not make any marks in the "C", "D", and "E" circles. In order to maintain your anonymity, do not make any marks in the "Name" and "Identification No." sections.

NOW OPEN THE BOOKLET AND START WITH QUESTION 1.

1. a. I am bound by the principle of fairness.

   b. I am not absolutely bound by the principle of fairness.

2. a. When a friend does me a favor, I feel that I must return it.

   b. When a friend does me a favor, I do not feel that I must return it.

3. a. I feel I must always tell the truth.

   b. I do not always tell the truth.

4. a. No matter how hard I try, my feelings are often hurt.

   b. If I manage the situation right, I can avoid being hurt.

5. a. I feel that I must strive for perfection in everything that I undertake.

   b. I do not feel that I must strive for perfection in everything that I undertake.

6. a. I often make my decisions spontaneously.

   b. I seldom make my decisions spontaneously.

7. a. I am afraid to be myself.

   b. I am not afraid to be myself.

8. a. I feel obligated when a stranger does me a favor.

   b. I do not feel obligated when a stranger does me a favor.

9. a. I feel that I have a right to expect others to do what I want of them.

   b. I do not feel that I have a right to expect others to do what I want of them.

10. a. I live by values which are in agreement with others.

    b. I live by values which are primarily based on my own feelings.

11. a. I am concerned with self-improvement at all times.

    b. I am not concerned with self-improvement at all times.

12. a. I feel guilty when I am selfish.

    b. I don't feel guilty when I am selfish.

13. a. I have no objection to getting angry.

    b. Anger is something I try to avoid.

14. a. For me, anything is possible if I believe in myself.

    b. I have a lot of natural limitations even though I believe in myself.

15. a. I put others' interests before my own.

    b. I do not put others' interests before my own.

16. a. I sometimes feel embarrassed by compliments.

    b. I am not embarrassed by compliments.

17. a. I believe it is important to accept others as they are.

    b. I believe it is important to understand why others are as they are.

18. a. I can put off until tomorrow what I ought to do today.

    b. I don't put off until tomorrow what I ought to do today.

19. a. I can give without requiring the other person to appreciate what I give.

    b. I have a right to expect the other person to appreciate what I give.

20. a. My moral values are dictated by society.

    b. My moral values are self-determined.

21. a. I do what others expect of me.

    b. I feel free to not do what others expect of me.

22. a. I accept my weaknesses.

    b. I don't accept my weaknesses.

23. a. In order to grow emotionally, it is necessary to know why I act as I do.

    b. In order to grow emotionally, it is not necessary to know why I act as I do.

24. a. Sometimes I am cross when I am not feeling well.

    b. I am hardly ever cross.

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25. a. It is necessary that others approve of what I do.

    b. It is not always necessary that others approve of what I do.

26. a. I am afraid of making mistakes.

    b. I am not afraid of making mistakes.

27. a. I trust the decisions I make spontaneously.

    b. I do not trust the decisions I make spontaneously.

28. a. My feelings of self-worth depend on how much I accomplish.

    b. My feelings of self-worth do not depend on how much I accomplish.

29. a. I fear failure.

    b. I don't fear failure.

30. a. My moral values are determined, for the most part, by the thoughts, feelings and decisions of others.

    b. My moral values are not determined, for the most part, by the thoughts, feelings and decisions of others.

31. a. It is possible to live life in terms of what I want to do.

    b. It is not possible to live life in terms of what I want to do.

32. a. I can cope with the ups and downs of life.

    b. I cannot cope with the ups and downs of life.

33. a. I believe in saying what I feel in dealing with others.

    b. I do not believe in saying what I feel in dealing with others.

34. a. Children should realize that they do not have the same rights and privileges as adults.

    b. It is not important to make an issue of rights and privileges.

35. a. I can "stick my neck out" in my relations with others.

    b. I avoid "sticking my neck out" in my relations with others.

36. a. I believe the pursuit of self-interest is opposed to interest in others.

    b. I believe the pursuit of self-interest is not opposed to interest in others.

37. a. I find that I have rejected many of the moral values I was taught.

    b. I have not rejected any of the moral values I was taught.

38. a. I live in terms of my wants, likes, dislikes and values.

    b. I do not live in terms of my wants, likes, dislikes and values.

39. a. I trust my ability to size up a situation.

    b. I do not trust my ability to size up a situation.

40. a. I believe I have an innate capacity to cope with life.

    b. I do not believe I have an innate capacity to cope with life.

41. a. I must justify my actions in the pursuit of my own interests.

    b. I need not justify my actions in the pursuit of my own interests.

42. a. I am bothered by fears of being inadequate.

    b. I am not bothered by fears of being inadequate.

43. a. I believe that man is essentially good and can be trusted.

    b. I believe that man is essentially evil and cannot be trusted.

44. a. I live by the rules and standards of society.

    b. I do not always need to live by the rules and standards of society.

45. a. I am bound by my duties and obligations to others.

    b. I am not bound by my duties and obligations to others.

46. a. Reasons are needed to justify my feelings.

    b. Reasons are not needed to justify my feelings.

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47. a. There are times when just being silent is the best way I can express my feelings.

    b. I find it difficult to express my feelings by just being silent.

48. a. I often feel it necessary to defend my past actions.

    b. I do not feel it necessary to defend my past actions.

49. a. I like everyone I know.

    b. I do not like everyone I know.

50. a. Criticism threatens my self-esteem.

    b. Criticism does not threaten my self-esteem.

51. a. I believe that knowledge of what is right makes people act right.

    b. I do not believe that knowledge of what is right necessarily makes people act right.

52. a. I am afraid to be angry at those I love.

    b. I feel free to be angry at those I love.

53. a. My basic responsibility is to be aware of my own needs.

    b. My basic responsibility is to be aware of others' needs.

54. a. Impressing others is most important.

    b. Expressing myself is most important.

55. a. To feel right, I need always to please others.

    b. I can feel right without always having to please others.

56. a. I will risk a friendship in order to say or do what I believe is right.

    b. I will not risk a friendship just to say or do what is right.

57. a. I feel bound to keep the promises I make.

    b. I do not always feel bound to keep the promises I make.

58. a. I must avoid sorrow at all costs.

    b. It is not necessary for me to avoid sorrow.

59. a. I strive always to predict what will happen in the future.

    b. I do not feel it necessary always to predict what will happen in the future.

60. a. It is important that others accept my point of view.

    b. It is not necessary for others to accept my point of view.

61. a. I only feel free to express warm feelings to my friends.

    b. I feel free to express both warm and hostile feelings to my friends.

62. a. There are many times when it is more important to express feelings than to carefully evaluate the situation.

    b. There are very few times when it is more important to express feelings than to carefully evaluate the situation.

63. a. I welcome criticism as an opportunity for growth.

    b. I do not welcome criticism as an opportunity for growth.

64. a. Appearances are all-important.

    b. Appearances are not terribly important.

65. a. I hardly ever gossip.

    b. I gossip a little at times.

66. a. I feel free to reveal my weaknesses among friends.

    b. I do not feel free to reveal my weaknesses among friends.

67. a. I should always assume responsibility for other people's feelings.

    b. I need not always assume responsibility for other people's feelings.

68. a. I feel free to be myself and bear the consequences.

    b. I do not feel free to be myself and bear the consequences.

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69. a. I already know all I need to know about my feelings.

    b. As life goes on, I continue to know more and more about my feelings.

70. a. I hesitate to show my weaknesses among strangers.

    b. I do not hesitate to show my weaknesses among strangers.

71. a. I will continue to grow only by setting my sights on a high-level, socially approved goal.

    b. I will continue to grow best by being myself.

72. a. I accept inconsistencies within myself.

    b. I cannot accept inconsistencies within myself.

73. a. Man is naturally cooperative.

    b. Man is naturally antagonistic.

74. a. I don't mind laughing at a dirty joke.

    b. I hardly ever laugh at a dirty joke.

75. a. Happiness is a by-product in human relationships.

    b. Happiness is an end in human relationships.

76. a. I only feel free to show friendly feelings to strangers.

    b. I feel free to show both friendly and unfriendly feelings to strangers.

77. a. I try to be sincere but I sometimes fail.

    b. I try to be sincere and I am sincere.

78. a. Self-interest is natural.

    b. Self-interest is unnatural.

79. a. A neutral party can measure a happy relationship by observation.

    b. A neutral party cannot measure a happy relationship by observation.

80. a. For me, work and play are the same.

    b. For me, work and play are opposites.

81. a. Two people will get along best if each concentrates on pleasing the other.

    b. Two people can get along best if each person feels free to express himself.

82. a. I have feelings of resentment about things that are past.

    b. I do not have feelings of resentment about things that are past.

83. a. I like only masculine men and feminine women.

    b. I like men and women who show masculinity as well as femininity.

84. a. I actively attempt to avoid embarrassment whenever I can.

    b. I do not actively attempt to avoid embarrassment.

85. a. I blame my parents for a lot of my troubles.

    b. I do not blame my parents for my troubles.

86. a. I feel that a person should be silly only at the right time and place.

    b. I can be silly when I feel like it.

87. a. People should always repent their wrongdoings.

    b. People need not always repent their wrongdoings.

88. a. I worry about the future.

    b. I do not worry about the future.

89. a. Kindness and ruthlessness must be opposites.

    b. Kindness and ruthlessness need not be opposites.

90. a. I prefer to save good things for future use.

    b. I prefer to use good things now.

91. a. People should always control their anger.

    b. People should express honestly-felt anger.

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92. a. The truly spiritual man is sometimes sensual.
    b. The truly spiritual man is never sensual.

93. a. I am able to express my feelings even when they sometimes result in undesirable consequences.
    b. I am unable to express my feelings if they are likely to result in undesirable consequences.

94. a. I am often ashamed of some of the emotions that I feel bubbling up within me.
    b. I do not feel ashamed of my emotions.

95. a. I have had mysterious or ecstatic experiences.
    b. I have never had mysterious or ecstatic experiences.

96. a. I am orthodoxly religious.
    b. I am not orthodoxly religious.

97. a. I am completely free of guilt.
    b. I am not free of guilt.

98. a. I have a problem in fusing sex and love.
    b. I have no problem in fusing sex and love.

99. a. I enjoy detachment and privacy.
    b. I do not enjoy detachment and privacy.

100. a. I feel dedicated to my work.
    b. I do not feel dedicated to my work.

101. a. I can express affection regardless of whether it is returned.
    b. I cannot express affection unless I am sure it will be returned.

102. a. Living for the future is as important as living for the moment.
    b. Only living for the moment is important.

103. a. It is better to be yourself.
    b. It is better to be popular.

104. a. Wishing and imagining can be bad.
    b. Wishing and imagining are always good.

105. a. I spend more time preparing to live.
    b. I spend more time actually living.

106. a. I am loved because I give love.
    b. I am loved because I am lovable.

107. a. When I really love myself, everybody will love me.
    b. When I really love myself, there will still be those who won't love me.

108. a. I can let other people control me.
    b. I can let other people control me if I am sure they will not continue to control me.

109. a. As they are, people sometimes annoy me.
    b. As they are, people do not annoy me.

110. a. Living for the future gives my life its primary meaning.
    b. Only when living for the future ties into living for the present does my life have meaning.

111. a. I follow diligently the motto, "Don't waste your time."
    b. I do not feel bound by the motto, "Don't waste your time."

112. a. What I have been in the past dictates the kind of person I will be.
    b. What I have been in the past does not necessarily dictate the kind of person I will be.

113. a. It is important to me how I live in the here and now.
    b. It is of little importance to me how I live in the here and now.

114. a. I have had an experience where life seemed just perfect.
    b. I have never had an experience where life seemed just perfect.

115. a. Evil is the result of frustration in trying to be good.
    b. Evil is an intrinsic part of human nature which fights good.

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116. a. A person can completely change his essential nature.

b. A person can never change his essential nature.

117. a. I am afraid to be tender.

b. I am not afraid to be tender.

118. a. I am assertive and affirming.

b. I am not assertive and affirming.

119. a. Women should be trusting and yielding.

b. Women should not be trusting and yielding.

120. a. I see myself as others see me.

b. I do not see myself as others see me.

121. a. It is a good idea to think about your greatest potential.

b. A person who thinks about his greatest potential gets conceited.

122. a. Men should be assertive and affirming.

b. Men should not be assertive and affirming.

123. a. I am able to risk being myself.

b. I am not able to risk being myself.

124. a. I feel the need to be doing something significant all of the time.

b. I do not feel the need to be doing something significant all of the time.

125. a. I suffer from memories.

b. I do not suffer from memories.

126. a. Men and women must be both yielding and assertive.

b. Men and women must not be both yielding and assertive.

127. a. I like to participate actively in intense discussions.

b. I do not like to participate actively in intense discussions.

128. a. I am self-sufficient.

b. I am not self-sufficient.

129. a. I like to withdraw from others for extended periods of time.

b. I do not like to withdraw from others for extended periods of time.

130. a. I always play fair.

b. Sometimes I cheat a little.

131. a. Sometimes I feel so angry I want to destroy or hurt others.

b. I never feel so angry that I want to destroy or hurt others.

132. a. I feel certain and secure in my relationships with others.

b. I feel uncertain and insecure in my relationships with others.

133. a. I like to withdraw temporarily from others.

b. I do not like to withdraw temporarily from others.

134. a. I can accept my mistakes.

b. I cannot accept my mistakes.

135. a. I find some people who are stupid and uninteresting.

b. I never find any people who are stupid and uninteresting.

136. a. I regret my past.

b. I do not regret my past.

137 a. Being myself is helpful to others.

b. Just being myself is not helpful to others.

138. a. I have had moments of intense happiness when I felt like I was experiencing a kind of ecstasy or bliss.

b. I have not had moments of intense happiness when I felt like I was experiencing a kind of bliss.

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139. a. People have an instinct for evil.

b. People do not have an instinct for evil.

140. a. For me, the future usually seems hopeful.

b. For me, the future often seems hopeless.

141. a. People are both good and evil.

b. People are not both good and evil.

142. a. My past is a stepping stone for the future.

b. My past is a handicap to my future.

143. a. "Killing time" is a problem for me.

b. "Killing time" is not a problem for me.

144. a. For me, past, present and future is in meaningful continuity.

b. For me, the present is an island, unrelated to the past and future.

145. a. My hope for the future depends on having friends.

b. My hope for the future does not depend on having friends.

146. a. I can like people without having to approve of them.

b. I cannot like people unless I also approve of them.

147. a. People are basically good.

b. People are not basically good.

148. a. Honesty is always the best policy.

b. There are times when honesty is not the best policy.

149. a. I can feel comfortable with less than a perfect performance.

b. I feel uncomfortable with anything less than a perfect performance.

150. a. I can overcome any obstacles as long as I believe in myself.

b. I cannot overcome every obstacle even if I believe in myself.

APPENDIX C

CONTENT ANALYSIS OF THE ITEMS DELETED FROM THE ORIGINAL ICDA AND ECDA SCALES

Appendix C

Content Analysis of the Items Deleted From the Original ICDA and ECDA Scales

Content analysis of the items deleted from the original ICDA and ECDA scales suggested at least five possible sources for item deletion.

1: The item did not discriminate between internal control discrimination accuracy and external control discrimination accuracy. The item presented a blend of trying to control the external domain and not controlling the internal domain.

Example: POI Item 76

a. I only feel free to show friendly feelings to strangers.

b. I feel free to show both friendly and unfriendly feelings to strangers.

Choice "a" can be interpreted as restricting an internal control or as trying to control the reactions of others by the type of feelings expressed. In addition to POI Item 76; POI Items 30, 38, 71, 112, and 146 were considered to have had this source for deletion form the original ICDA or ECDA scales.

2: The "control discrimination accuracy" alternative did not reflect the reality of military life.

Example: POI Item 31:

a. It is possible to live life in terms of what I want to do.

b. It is not possible to live life in terms of what I want to do.

Choice "a" provides an alternative to the restricted perception of choice presented in choice "b" but it does not recognize the limitations in autonomous functioning that accompany military life.

3: The item was conceptually unclear for the purpose of making an accurate control discrimination.

Example: POI Item 46

a. Reasons are needed to justify my feelings.

b. Reasons are not needed to justify my feelings.

Choice "a" suggests a demand for justification of feelings yet choice "b" could be interpreted as spontaneous creation of feelings as opposed to the mediational model of the Control Discrimination Accuracy Typology. In addition to POI Item 46; POI Items 35 and 48 were considered to have had this source for deletion form the original ICDA or ECDA scales.

4: The item was not worded in terms to reflect a forced choice, but instead reflected a possible choice within the individual´s internal domain of control.

Example: POI Item 49

a. I like everyone I know.

b. I do not like everyone I know.

Choice "a" does not necessarily reflect a forced choice of must like. It could be interpreted as reflecting a choice within the individual´s control to like everyone known by the individual. In addition to POI Item 49; POI Items 16 and 95 were considered to have had this source for deletion form the original ICDA or ECDA scales.

5: The alternative to the situation of no choice was worded in negative terms.

Example: POI Item 131

a. Sometimes I feel so angry I want to destroy or hurt others.

b. I never feel so angry that I want to destroy or hurt others.

Choice "b" could be considered to reflect a restriction over the choices within the internal domain but the alternative is worded in terms of affirming a negative consequence: "to destroy or hurt others." It appearred that endorsement of this option over a no choice option

was limited by the wording of the alternative.

APPENDIX D

CONTENT ANALYSIS OF THE FOUR FACTORS FROM THE ICDA AND ECDA ITEMS

Appendix D

Content Analysis of the Four Factors From ICDA and ECDA Items

Factor 1

Content: Internal control discrimination accuracy aspect of exercising or not exercising a choice within the internal domain.

Choices from highest loaded items reflecting Factor 1 content:

POI 1 a. I am bound by the principle of fairness.

POI 23 a. In order to grow emotionally it is necessary to know why I act as I do.

POI 109 a. As they are, people sometimes annoy me.

Factor 2

Content: External control discrimination accuracy aspect of trying to control or not trying to control the reactions of others.

Choices from highest loaded items reflecting Factor 2 content:

POI 9 a. I feel that I have a right to expect others to do what I want of them.

POI 25 a. It is necessary that others approve of what I do.

POI 55 a. To feel right, I need always to please others.

Factor 3

Content: Internal control discrimination accuracy aspect of pursuing perfection in behavior by restricing choices within the internal domain of control.

Choices from highest loaded items reflecting Factor 3 content:

POI 3 a. I feel I must always tell the truth.

POI 18 b. I don't put off what I ought to do today.

POI 148 a. Honesty is always the best policy.

Factor 4

Content: External control discrimination accuracy aspect of trying to control or not trying to control the reactions of others.

Choices from highest loaded items reflecting Factor 4 content:

POI 61 a. I only feel free to express warm feelings to my friends.

POI 67 a. I should always assume responsibility for other people's feelings.

POI 107 a. When I really love myself, everybody will love me.

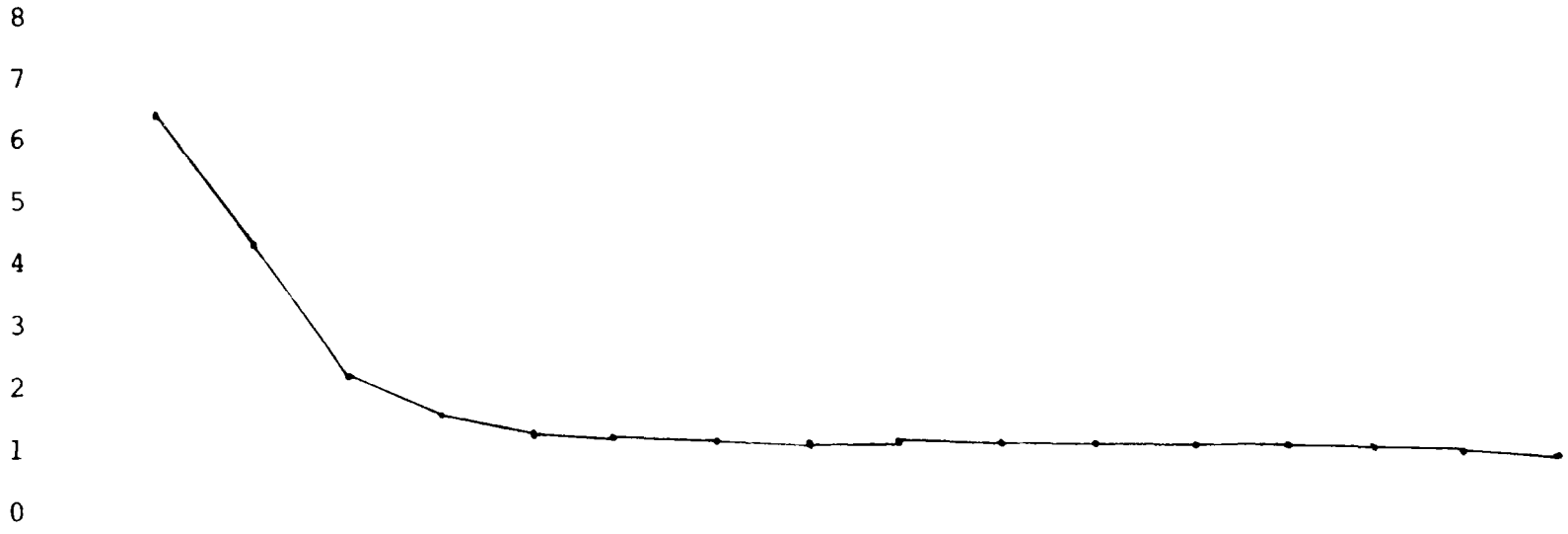
APPENDIX E

SCREE TEST OF

CDA ITEMS FACTOR ANALYSIS

Appendix E

Scree Test of
CDA Items Factor Analysis



Factor	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Eigenvalue	6.20	4.20	2.12	1.63	1.48	1.40	1.30	1.24	1.21	1.18	1.13	1.11	1.08	1.03	1.02	1.00

END

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