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**A DESCRIPTIVE STUDY OF THE RELATIONSHIP OF SELECTED
NEUROPSYCHOLOGICAL FACTORS AND COGNITIVE
LEARNING STYLES OF ALCOHOLICS**

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**A Descriptive Study of the Relationship of Selected
Neuropsychological Factors and Cognitive
Learning Styles of Alcoholics**

by

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Dedication

Mom, Mark, and Barbara, my long-time supporters, and
Steve, Mary, and Joe, who supported them;
John and Amy, who supported them;
My friends in recovery
And those still suffering; as well as,
A Higher Power who supports us all.

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But for Barbara Niman and the Niman family, I would have never attempted this project “One Day at a Time.” I have to thank Mark and Mom for their eternal faith in me and the support of my dear friends in Alcoholics Anonymous and Austin Recovery.

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Educational theories and practices that substantiate effective learning and development are seldom emphasized in the psychoeducational component of recovery programs for alcoholism. The primary purpose of this research was to study the relationship between selected neuropsychological and personality variables and cognitive learning styles of alcoholics during different lengths of time alcohol free. The whole population in this study consisted of 126 male and female self-selected subjects ranging in age from 18 to 65 years. Ethnic backgrounds were mixed. All subjects identified themselves as alcoholics. Subjects were associated with a psychoeducational treatment center and Alcoholics Anonymous. The whole group had from 0 days of sobriety to 35 years

of abstinence. Subjects completed a demographic instrument, two cognitive tests (Shipley Institute of Living Scale-Vocabulary and Abstraction Test-SILS and the Group Embedded Figures Test -GEFT) and one learning styles inventory (Kolb Learning Styles Inventory-LSI). The mean IQ scores on the SILS for ethnic subjects and the group with 28 days or less sobriety were significantly lower than the white-non-Hispanic with 29 days or more sobriety. A need for more ethnic representation in the study limited some results.

Interaction effects were identified between those subjects with less than 28 days of sobriety and 29 days or more sobriety on SILS vocabulary and abstraction scores. The two sample groups (newly sober and longer term sober) did not show a significant difference in abstraction skills on the GEFT. Field dependence was not a significant outcome. The SILS T- scores were higher than the average scores suggested in the SILS testing manual. Interaction effects between ethnicity and education were identified suggesting these variables may be as significant in this group as length of sobriety. More research was recommended to identify the vocabulary of recovery since addiction literature indicates that alcoholics with higher cognitive restructuring skills may have longer terms of sobriety. No specific learning style was identified for the group by the data from the Kolb LSI. Since the LSI pointed toward more individualized instruction for the group, the study suggests Vygotskian theories of dynamic assessment and attention to the curriculum and instruction of recovery programs may be applicable when designing instruction for the psychoeducational component of recovery programs and may be as important in recovery as length of sobriety during treatment.

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CHAPTER 1

INTRODUCTION

Educational theories and practices that substantiate effective learning and development are seldom emphasized in the psychoeducational component of recovery programs for alcoholism. In the early 1980s Ryan and Butters (1983) pointed to the need for more attention to personality variables in substance abuse treatment and recovery such as intensity of motivation, affective states, educational background, and acquisition of skills necessary to carry out higher-order cognitive tasks like problem solving. In 1991 Miller recommended that psychoeducation explore theories of learning and personality variables as central issues in an alcoholic's recovery from alcohol dependence.

Today, little attention is paid to alcoholic learning preferences and styles of learning. The relationship of neurological factors to genetic and biochemical variables are stressed (learning and memory, abstract reasoning and problem solving, and manipulation of objects to assess perceptual and motor skills). More research is needed to identify the learning preferences of alcohol dependents that are associated with their individual styles of learning.

In 1937 Gordon Allport introduced the concept of "cognitive style" as a personality variable. Herman Witkin (1950) expanded the construct of style in the early 1950s with his concept of "field dependence-independence" (FDI). Wapner (Wapner & Demick, 1991) maintains that educational research has never fully supported the original conceptualization of field dependence-independence as

style (Witkin, 1950). The difference between “style” and “ability” has never been settled. Some educators consider field dependence as ability and not style because FDI test questions seem to have right and wrong answers (Sternberg 1994). Usually the field independent (FI) learner is portrayed as having all the good qualities (able to view different parts of a field as being discrete from organized ground) while the field dependent learner (FD) is shown to have deficiencies (not able to trace simple forms embedded in complex figures) (Witkin, 1950, 1959). Riding and Cheema (1991) conclude that a fundamental weakness of the measures for field dependence-independence (Group Embedded Figures Test and the Rod and Frame Test) is that a high score gives the impression that Field independents perform better on the test and are more intelligent. Also, many types of tasks, which are included in the FDI tests, show that field independent subjects perform better (p.210). When the cognitive style of alcoholics has been examined and classified in published studies, a significant number of alcoholic subjects are categorized as field “dependent,” as opposed to field “independent” (Witkin, Karp, et al., 1959).

The debate concerning the nature of intelligence as ability has been continuous over the last one hundred years. At about the same time that Witkin introduced field dependence-independence as cognitive style, The Wechsler Adult Intelligence Scale (WAIS) was established in 1955 and revised in 1981 (WAIS-R). The WAIS-R (1981) is used to assess neurological function in alcoholics. Using Wechsler’s tests as an example, Lezak (1981) claims “The Wechsler” is the most widely used mental ability test which offers a variety of tasks testing

different skills and capacities. Wechsler's intelligence tests are still in high regard and are known for test validity (Lezak 1983, p. 239). Although some educators respect the full scale IQ score of the WAIS and the WAIS-R as an excellent predictor of academic achievement, such a statistic is not useful in neuropsychological testing (Lezak, 1983, p. 242). Lezak further explains both verbal and performance scale IQ scores, are based on the average of some quite dissimilar functions that have relatively low intercorrelations and bear no regular neuroanatomical or neuropsychological relationship to one another. Wechsler (1943) made explicit statements on intelligence, which he never recounted:

The portions or aspects of intelligent behavior which our tests do measure effectively are those which are determined by the intellectual factors of intelligence, whether by the general one "g," or more specific ones such as verbal ability, abstract reasoning, arithmetical or other abilities which have been isolated by tetrad and multi-factorial analysis. These intellectual factors do not, in my opinion, constitute all the factors which enter into our intelligence behavior. Indeed, they do not even constitute all the factors that enter into our intelligence tests (p.123).

Early psychological theorists treated intelligence as a unitary capacity. In 1943 Wechsler published the article "Nonintellectual Factors of General Intelligence" in the Journal of Abnormal and Social Psychology making a direct statement of the limitations existing in the accepted IQ tests of that period. Wechsler further defined the role of nonintellectual factors in test performance, and continued his attempts during his career to define what "nonintellectual factors" might be:

Ultimately, intelligence is not a kind of ability at all, certainly not in the same sense that reasoning, memory, verbal fluency, etc. are so regarded. Rather, it is something that is inferred from the way these abilities are manifested under different conditions and circumstances. One can infer an

individual's intelligence from how he thinks, talks, moves, almost from any of the many ways he reacts to stimuli of one kind or another. Indeed, historically, appraisal of such responses has been the usual way by which intelligence has been judged. Mental tests are a relatively new invention, a new method which psychologists think is a better or at least more scientific procedure. Accordingly, it is important to remember what tests of mental ability represent (p 48).

The definition of "intelligence" has evolved within traditional and post-modern psychology. If "intelligence" encompasses only performance on neuropsychological tests, alcoholics show mild to severe deficits in abstract-reasoning abilities, executive functions, visual spatial skills, new learning and memory in addition to structural and functional brain abnormalities (Bates, 1997). Oddly enough, most of the alcoholic populations assessed show slightly above average intelligence on traditional intelligence tests (Parsons & Leber, 1981, p. 326). Sternberg (1996) comments:

If IQ rules, it is only because we let it. And when we let it rule, we choose a bad master. We got ourselves into the test mess; we can get ourselves out of it. It's a mess from which I personally had to extricate myself (p. 17).

Sternberg (1994) supports the idea that one style may be better in one situation than another; however, learning preferences should not be considered right or wrong nor better or worse. The theory of multiple intelligences (Gardner, 1983) concludes that accurate identification of spatial intelligence (finding simple forms in complex figures) involves abilities that are not clearly identified. According to Gardner, when subjects are asked to produce or manipulate graphic forms, they may be acute in perception but unable to draw, imagine, or transform an absent world (p. 173). Kolb (1984) explains in his model of learning that one

or all of a few specific learning processes are used in the act of knowledge acquisition. “It appears that the physiological structures that govern learning allow for the emergence of unique individual adaptive processes that tend to emphasize some adaptive orientations over others” (p. 62). The result is an individual learning style for each human being. “The basic dilemma for the scientific study of individual differences, therefore, is how to conceive of general laws or categories for describing human individuality that do justice to the full array of human uniqueness” (p. 63).

Although still searching for the relationship of style and ability in connection with intelligence, educational psychology has re-defined and expanded the field dependence-independence construct (Curry, 1991; Riding & Cheema, 1991; Rayner & Riding, 1997; Riding, 1997). Recent educational research in defining intelligence has been more interested in contextually intelligent behavior (Sternberg, 1985) and the connection between the social process of “experiential learning” and the complex structure of knowledge acquisition (Kolb, 1984). Recent theories of learning are exploring “constructivism” or “constructivist learning environments” which view instruction as a learning environment designed with a meaning-construction view of knowledge. A learning environment is a place where people can draw upon resources to make sense out of things and construct meaningful solutions to problems with skillful use of social interaction (Wilson, 1996) .

However, alcoholism research and the psychoeducational components of treatment and recovery have never fully explored the FDI concept since Witkin

(1959). No studies have been found investigating newer conceptualizations of cognitive learning style in alcoholics.

Chapter 1 of this research points to the lack of attention by substance abuse researchers to the learning preferences of alcoholics when designing instruction for the psychoeducational component of treatment and recovery. This first chapter explores three major areas of concern: one, the introduction of selected neuropsychological factors and personality variables of alcoholics; two, the establishment of the psychoeducational component of contemporary recovery models; and three, a discussion of important general theories of education that suggest the relationship of cognitive learning style to the psychoeducational component of alcoholism recovery programs.

Alcoholic Treatment and Recovery Learning Variables

The complexities of alcoholism have become such a fascination with researchers that frequent studies across disciplines (the physical sciences, the biological sciences, and the social sciences) have appeared in numerous research journals (Levin 1990). Often mentioned in addiction research are the neuropsychological factors and the personality variables of the alcohol dependent.

NEUROPSYCHOLOGICAL FACTORS AND PERSONALITY VARIABLES

Neuropsychological testing has documented that more than half of the individuals who present themselves for alcoholism treatment show mild to severe deficits in abstract-reasoning abilities, executive functions, spatial skills, and new

learning and memory (Bates, 1997). Parsons and Leber (1981) examined 22 well-known studies on alcoholism. Findings of 14 studies, which used traditional intelligence tests, categorized the alcoholic subjects as “average to slightly above average intelligence” (p. 326). Another 8 reports showed scores in spatial pattern reproduction, object assembly, and coding speed significantly lower than controls (p. 327). Parsons (1981) concluded that the same “lowered abilities” of alcoholics are present in patients with brain damage.

Various personality factors have been described in the literature of both alcoholism research and educational psychology and can be catalogued under the psychodynamics of understanding the human personality, social interaction, the conscious and unconscious mind, and the resolution of conscious and unconscious conflicts to achieve personal goals (Jellinek, 1960; Bandura, 1977; Beck, Rush, et al., 1979; Barnes, 1983; Ryan & Butters, 1983; Parsons, 1994; Alford & Beck, 1997; Ellis, 1999). A metaanalysis of reports in the early 1980s concerning the alcoholic personality reviewed by Barnes (1983) indicated four personality characteristics in alcoholics; stimulus augmenting, field dependence, weak ego, and anxiety (p. 894).

Today, a major focus of alcoholism research is biomedical studies and a search for effective drug therapies to use as pharmacological adjuncts to alcoholism treatment programs. Research of the drug naltrexone has shown promise (Volpicelli, Alterman, et al., 1992). Abstinence is a major problem for recovering alcoholics, who report a 50 per cent relapse rate within the first 3 months after treatment (p. 876). Resumption of binge drinking was stopped with

few side effects after treatment with naltrexone (Volpicelli, Alterman, et al., 1992). A search continues for an effective combination of pharmacological agents and psychosocial alcohol rehabilitation programs, such as cognitive and behavioral therapy to assist alcoholics (Dent & Salkovskis, 1986; Yohman, Schaeffer, et al., 1988; Alford & Beck, 1997; Ellis, 1999).

The Alcoholic Personality

In early studies, researchers sought to define the “prealcoholic” and “alcoholic” personality. Lisansky (1960) addresses stringent criteria for the characterization of a “prealcoholic” personality or predisposition to alcoholism. Scores on personality tests of alcoholics and nonalcoholics must be discriminated by an unambiguous “pattern or personality” which is not present in other clinical groups. In addition, these particular personality characteristics should “predispose a person to become an alcoholic and do not simply occur as a consequence of the disorder” (Barnes, 1983, p. 114).

Since the focus of research on discovering the constructs of an alcoholic personality in the early 1980s (Barnes, 1983, p. 159), significant longitudinal studies could not be found which investigated major personality variables of alcohol-dependents over time. Studies over the last fifty years have agreed: alcoholics are usually devoid of positive direction in behaviors, which is associated with an external rather than an internal locus of control (Rohsenow & O'Leary, 1978). After a metaanalysis of studies identifying characteristics of alcoholics, Miller (1991) found that major depression is the most common

diagnosis in female alcoholics and antisocial personality is the most common diagnosis in males.

Some researchers in education in past decades have concluded that a learner who is field dependent has many negative cognitive style characteristics and achievement outcomes (Davis, 1991, p. 168).

The Psychoeducational Component of Recovery Models

The recovery model guided this study. The term recovery indicates a state of abstinence that has been transformed, in keeping with common usage among 12-Step (Anonymous 1976) advocates. As an active and ongoing process, recovery is built on a social interaction foundation of abstinence. Brown (1985) introduced a developmental model of recovery, as an ongoing interactive process, which has two levels: 1) an abiding focus on alcohol, its use and abuse, and abstinence from it, with 2) a developmental emphasis involving examination and reorganization of multiple dimensions of life such as thoughts, feelings, relationships, situations, world-view, and spirituality. Three social models of recovery are prevalent in alcoholism treatment: The Cognitive-Behavioral Model, The Minnesota Model, and the Therapeutic Community Model.

THE COGNITIVE-BEHAVIORAL MODEL

Rational-Emotive Therapy (RET) developed by Albert Ellis (1999) is sometimes more behavioral than cognitive (Ellis, 1999) exploring disappointment,

frustration, annoyance. Even unhealthy and self-defeating thoughts and actions such as horror, terror, panic, depression, or self-hating may be emotions that work on the premise that alcoholics make choices about how they act and feel.

They (alcoholics) usually, though not always, create and construct healthy feelings by believing rational or functional beliefs, and they usually, though not always, create self-defeating feelings and behaviors by constructing and creating irrational or self-defeating beliefs (Ellis, 1999, p. 70).

Aaron Beck (1979) also uses cognitive behavioral therapy as a popular theory for treating alcoholism (Beck, Rush, et al., 1979; Alford & Beck, 1997). Cognitive behavioral therapy teaches the alcoholic learner that “meaning a person attaches to a situation, or way an event is structured (or constructed) by a person, theoretically determines how that person will feel and behave” (Alford & Beck, 1997, p. 23).

THE MINNESOTA MODEL

The goal of the Minnesota Model for the treatment of the disease of alcoholism is “to help the alcoholic learn to live with and cope with this chronic illness” (Hazeldon Foundation, 1981). In 1950, after alcoholics had been locked in mental hospitals, psychiatric wards, and other secluded facilities, alcoholism was recognized as a mental and physical disease described as denial, self-centeredness, and uncontrollable consumption of alcohol. The term “chemical dependency” developed, and treatment began to emphasize “giving care” rather than “administering a cure.” Treatment strategies using the Minnesota Model involve various events of social interaction for learning and development:

discussions of experiential backgrounds of alcoholic events, open and honest communication with alcoholic peers resulting in self-revelation in task-oriented groups (learning to interact with other alcoholics and recovering alcoholic counselors), peer group activities (small group meetings without professional counseling), didactic lectures (12-Step symposiums with members of Alcoholics Anonymous taught by recovering members of AA), detoxification and periods of structured recovery exercises, assessments and psychological evaluations, one on one meetings with recovering counselors, individualized instruction focusing on learning strategies for living, and personal cognitive coaching and role modeling.

The Minnesota Model encourages AA participation and supports the success of AA reported in a number of addiction journals (Sheeren 1987; Winegar, Stephens et al. 1987; Khantzian, Halliday et al. 1990; Brown and Peterson 1991; Caldwell and Cutter 1998). Evidence is increasing that participation in AA arrests uncontrolled drinking of alcohol and lives are changed physically, emotionally, and spiritually (Khantzian, Halliday et al. 1990). Alcoholics Anonymous or AA, referred to as “12-Step,” was organized in 1936 around a powerful group psychology that addresses, interrupts, and modifies core problems in self-regulation (p. 77). AA supports the “innate ability of individuals to help and heal themselves and each other” and is the oldest, largest, and most widespread self-help group in the world (Winegar et al., 1987, p. 223).

THERAPEUTIC COMMUNITY

Therapeutic Communities began to appear in the 1970s. In the 80s the methods and foundations of the Therapeutic Communities were formed. The 90s brought even newer thoughts on recovery methods, which met head-on with traditional moral and ethical principles. As a result, radical treatment models developed in the recovery community. With the appearance of new recreational drugs, the increased delinquency of the unemployed young, and the reduction of funding for traditional medical model treatment programs, the Therapeutic Community was introduced as new and different. The purpose was to help the addicted learn new behaviors and take responsibility for their actions. Encounter groups were formed, family was encouraged to get involved in the Therapeutic Community recovery program, residential recovery programs appeared, and networking with the recovery community was encouraged (Broekaert, Kooyman, et al., 1998).

The Therapeutic Community model assumes that a change in lifestyle with abstinence from illicit substances and activities, removal of antisocial activity, working a job, and promotion of social values and positive attitudes will result in positive outcomes for the substance abuser. The therapeutic community becomes the therapist and teacher (DeLeon, 1988). Peers and staff become role models for learning to recover. The whole recovery environment becomes a 24-hour learning experience (p. 77) by creating a health second family environment. Since substance abuse is considered a disorder of the whole person, all the characteristics of the alcohol dependent are addressed: cognitive, behavioral,

medical, and emotional. The alcoholic's life is the frame in which the story of personal addiction is pictured. The Therapeutic Community recovery model has stratified communities living and working together which have set aside confrontational methods in favor of dialogue. Therapeutic Communities are based on common effort, acceptance of differences, and social learning. The theory of the therapeutic community has educational characteristics that promote integration of different recovery models and schools of thought.

General Education Theory and Cognitive Learning Style

The original "cognitive style" concept developed by Witkin (Witkin, Moore, et al., 1977) provided a foundation for understanding the cognitive "learning" style concept. Noted theorists have pointed out that intelligence or ability is not a consideration when relating to style. The thinking process is one major element of style as explored by Sternberg (1997) and other major theories such as Lev Vygotsky (1986). Certain assessments of style have been more popular than others (Witkin, Oltman, et al., 1971; Kolb, 1984) but tests for field dependence-independence have been most prevalent for decades (Witkin, 1950; Goldstein, Neuringer, et al., 1971; Witkin, Oltman, et al., 1971; Witkin, Moore, et al., 1977; Witkin, and R., 1981; Jonassen & Grabowski, 1993).

INTELLIGENCE AND STYLE

Traditional neuropsychological tests support the idea that intelligence has clear mental structures (each person must fit into one model) and require

sophisticated quantitative machinery for implementation (Sternberg, 2000, p. 10). These “one size fits all” views held by Spearman (1927) and Thurstone (1938) support the traditional mass educational approach in the early-industrialized society (Dewey, 1938). Public education in the early twentieth century went through a process of “Americanization” where social control and the domination of Anglo-American idealism were stressed. School architect C. B. J. Snyder designed the traditional standardized classroom of the first half of the century: rows of desks bolted to the floor and facing the blackboard (a symbol for the structured learning and thinking approach of the early twentieth century) (Spring, 1997). The postmodern society of today depends on the segmented production of ideas and images mostly used in offices and cubicles with work groups and problem-solving teams.

Today, cognitive psychologists like Sternberg (1996), who stress successful intelligence, and Gardner (1983), who points to multiple intelligences, and Kolb (1984), who argues experience is the basis of learning, explain that intelligence is part of a free-flowing and complex system (Sternberg, 1985, 1996, 1997, 2000; Sternberg & Williams, 1998). A combination of neuropsychological factors and personality variables (e.g., learner preferences) are important in the human psychology of learning and development.

All three recovery models for alcoholism support the original Alcoholics Anonymous (Anonymous, 1976) model which places a major emphasis on the alcoholic’s responsibility to “learn something of alcoholism” (Anonymous, 1976, p. 44) to remain alcohol free. The cognitive-behavior model encourages new

learning strategies to cope with personal emotions and trauma; the Minnesota Model (MM) teaches alcoholics to work on group cooperation with small task-oriented small group counseling; the Therapeutic Community model stress learning a new way of life through active participation in a positive environment. If major treatment and recovery support programs use constructivist learning methods and educational philosophies to teach alcoholics to stay alcohol free, logic demands the cooperation of educators and addiction research psychologists to build bridges between recovery methods and theories of learning (Miller, 1991; Ryan & Butters, 1983).

Since no research was found relating neuropsychological factors and learning preferences of alcoholics, this research looks at style, as a personality variable, and preference, as related to neuropsychological factors in recovery from alcoholism. Over the past 50 years educational psychology has searched for the relationships between the abilities needed for effective cognition and the learner's style or preferences while learning.

Overall, style is used to describe an individual quality, the use of learning strategies, certain learning activities or behavior sustained over time (Rayner & Riding, 1997). The premise that some people have a predominantly verbal way of information representation in thought while think in images is now widely accepted. Riding and Cheema (1991) found over 30 learning style labels from previous research, which they sorted into two principal cognitive style categories: the Wholist-Analytic, or processing information in wholes or parts,

and the Verbal-Imagery, or representing information during thinking verbally or in mental picture (p. 197).

In the last decade theorists and researchers in theories of learning have tried to present less complicated explanations for individual differences in styles of learning and cognition (Dunn, Dunn, et al., 1989; Curry, 1991; Riding & Cheema, 1991; Riding, 1997). The term “learning style” seems to be more prevalent in the literature and has emerged to replace “cognitive style” of the 1970s (Riding & Cheema, 1991, p. 194). Some refer to style in relation to cognition and learning with the general term “cognitive learning style.”

Herman Witkin and associates (Witkin, 1950; Witkin & R., 1981) and the early work of the Gestalt school of German psychology (Rayner & Riding, 1997, p. 7) expanded the concept of cognitive style. “Perception” was the focus of the early Rod and Frame Test (RFT) and Embedded Figures Test (EFT) by Witkin (1950), who classified cognitive style on a continuum of field dependence to field independence (FDI). Subjects were classified as to how they perceived an upright object in space with relationship to the body. The concept of FDI developed as a perceptual style (Witkin, 1950). The sometimes-complicated apparatus used in administering the RFT to evaluate FDI was replaced with a paper and pencil assessment, the Embedded Figures Test (EFT). The Group Embedded Figures Test (GEFT) was developed for testing groups of subjects.

McLoghlin (1999) presented a chart showing contemporary definitions of these similar terms relating to styles of cognition and learning (see Table 1).

Table 1.1. Definitions of similar terms relating to styles of learning and cognition (McLoughlin 1999).

Term	Explanation
Learning preference	Favoring one method of being taught
Learning strategy	Adopting a plan of action in the acquisition of knowledge, skills or attitudes
Learning style	Adopting a habitual and distinct mode of acquiring knowledge
Cognitive strategy	Adopting a plan of action in the process of organizing and processing information
Cognitive style	A systematic and habitual mode of organizing and processing information

Perceiving and “processing” are the two dimensions of the Kolb experiential learning style construct (Kolb, 1984), a product originally developed in the 1980s. The Learning Styles Inventory (LSI) (Kolb, 200) describes concrete and abstract thinking and active or reflective information-processing activity. The LSI integrates four types of learning styles described by Rayner and Riding (1997) as a “learning repertoire” made up of learning preferences.

Table 1.2. Four learning styles identified in the Learning Styles Inventory by Kolb (Rayner & Riding, 1997, p. 17)

Learning Style	Explanation
Divergers	Learners who typically perceive information concretely and process it reflectively, and who need to be personally engaged in the learning activity
Convergers	Learners who perceive information abstractly and process it reflectively, and who need to follow detailed, sequential steps in thinking in a learning activity
Assimilators	Learners who perceive information abstractly and process it actively, and who need to be involved in pragmatic problem solving in a learning activity
Accommodators	Learners who perceive information concretely and process it actively and who need to be involved in risk-taking, making changes, experimentation and flexibility in a learning activity.

THINKING STYLE

Thinking style has been the center of Sternberg's (1985) theory of intelligence. Sternberg (1997) found "people think in different ways" and overestimate the extent to which others think the way they do. The result is that misunderstanding develops. If the learner and the teacher understand individual "styles of thinking and learning," misunderstandings can be prevented. The result is a better understanding of one's self and others (p. 18). A contemporary approach to separating cognitive "style" and "ability" is explained by Sternberg:

A style is a way of thinking. It is not ability, but rather, a preferred way of using the abilities one has. The distinction between style and ability is a crucial one. Ability refers to how well someone can do something. Style refers to how someone likes to do something" (p. 9).

Style and ability are separate constructs that need to be addressed. Even with the importance of "thinking" noted in most treatment and recovery models, significant recognition of learning preferences is important for the psychoeducational component of recovery.

INTELLIGENCE AND STYLE INDEPENDENT

Constructs of cognitive learning style (and learning preferences) appear to be independent of intelligence (Riding, 1997, p. 33). Howard Gardner (1983) and his theory of Multiple Intelligences dispute the use of neuropsychological testing to encapsulate human problem solving capabilities. Multiple Intelligence theory identifies eight criteria to determine whether or not a capacity qualifies as

intelligence. According to MI theory (1983) human beings possess at least seven relatively autonomous abilities. Gardner believes that the view of intelligence as just linguistic and logical-mathematical abilities excludes musical, spatial, bodily-kinesthetic, interpersonal, and intrapersonal abilities. Human beings possess all of the intelligences with different strengths and weaknesses.

Robert J. Sternberg (1985) offers his triarchic theory of human intelligence as an explanation for a compilation of personality characteristics and the neuropsychological factors of the alcoholic learner. Sternberg's three-part (triarchic) theory provides a structure that supports investigations into effective instructional models for psychoeducation. Explaining the relationship between intelligence and experience on one hand while pointing out the association of human intelligence to the external world and the importance of context in assessing human intelligence, Sternberg clarifies intelligence. The third part of the triarchic theory describes the mental mechanisms considered to be "intelligent performance" (Sternberg, 1985).

David Kolb (1984) introduced an activity-centered model of individual learning styles, which he calls "experiential learning." Kolb connected the relationship of knowledge acquisition and intelligence to the works of John Dewey (1900) and Jean Piaget (1959). The "apprehension versus comprehension" dual-knowledge" experiential theory (Kolb, 1984) investigates the active involvement of the learning in the environment.

The powers of the mind are directly connected with the structure of reality. This rationalist orientation is reflected in the predominate position of action in Piaget's theory about how knowledge is created. For him, sensations and perceptions are only the start point of knowing; it is the

organization and transformation of these sensations through action, most particularly internalized actions or thoughts that creates knowledge. (p. 101).

The experiential learning model puts knowing by apprehension (perception and appreciation) on equal grounds with comprehension (analysis, criticism, and the rearrangement of times and different contexts) (Kolb 1984). Kolb (1984) relies on Jean Piaget's theory for his interpretation of intelligence.

...Intelligence is shaped by experience. Intelligence is not an innate internal characteristic of the individual but arises as a product of the interaction between the person and his or her environment (pp. 12-13).

ASSESSMENT OF LEARNER PREFERENCES AND NEUROPSYCHOLOGY

Identification of learner preferences while acquiring knowledge in treatment and recovery could be the factor that decides if an alcoholic can learn to stay alcohol free (Ryan & Butters, 1983). This research used two respected cognitive style tests to assess learner preferences: 1) the Group Embedded Figures Test (spatial perception) (Witkin, Karp, et al., 1959), and 2) the Kolb Learning Styles Inventory (identification of individual orientations toward learning modes) (Kolb, 2000, 1984). A third test, the Shipley Institute Vocabulary and Abstraction Subscales Tests (SILS-V and SILS-A) (Shipley, 1940), is used extensively as a quick method of identifying abstracting ability and vocabulary correlated with possible brain damage.

Purpose of the Study

The primary purpose of this research was to study the relationship between selected neuropsychological and personality variables and cognitive learning styles of alcoholics during different lengths of time clean and sober.

Most tests show alcoholics as having deficits in abstract-reasoning abilities, executive functions, spatial skills, and new learning and memory. One of the most-mentioned personality variables is field dependency, which is having difficulty extracting the simple form from a complex figure. However, attention to more contemporary theory and practice in cognitive learning style could not be found during extensive reviews of addiction literature. Questions need to be asked about the learning preferences of alcoholics.

Style is an important aspect of learning, which is separate from ability. Although major contemporary recovery models demonstrate the constructivist approach to education, using social interaction and peer support for learning, no research has been found on learning preferences. Addiction literature does suggest theories of learning may be the place to look for more effective outcomes in combating alcoholism. Learner preferences of alcoholic subjects will be described in this study using three respected and well-researched instruments.

Results of this descriptive study will provide initial research data to guide the development of more effective psychoeducational treatment and recovery methods in working with alcoholics. The major objective emphasizes the overall goal, which is to accentuate the importance of individual differences in learning

preferences. Learning preferences are as important as ability when designing instruction for substance abusers.

As a result of extensive examination of published research in the theory and practice of instructional design and psychoeducation, the following four research questions will be explored in this descriptive study of the learning preferences of alcohol-dependents individuals:

1. Does the length of sobriety affect the distribution of scores of alcoholics on the Group Embedded Figures Test (GEFT)?
2. Does the length of sobriety affect the distribution of scores of alcoholics on the vocabulary, abstraction, and IQ scores of alcoholics on the Shipley Institute of Living Scale (SILS)?
3. Does the length of sobriety affect the distribution of scores of alcoholics on the Kolb Learning Styles Inventory (LSI)?
4. Does the length of sobriety affect the correlation of scores of alcoholics in a negative or positive direction on the GEFT, SILS, and LSI?

LIMITATIONS OF THE STUDY

Although this study had 126 subjects, the researcher could not claim the effects were random. All subjects in the study were volunteers and self-professed alcoholics. No checking was done to certify lengths of sobriety. More ethnic minorities were needed to further verify the interaction effects of sobriety, ethnicity, and education.

CHAPTER 2

REVIEW OF THE LITERATURE

The purpose of this investigation of the substance abuse and cognitive learning style literature is to describe significant variables related to the psychoeducational component of the treatment and recovery programs for alcoholism. First, the chapter describes significant research of the neuropsychological factors of the brain influenced by alcohol and the effects of abstinence. Also, included are age related deficits and neurological and learning deficiencies. Next, the personality variable field dependence-independence introduced by Herman Witkin (1959) is explored as a major cognitive style variable of alcoholics. Finally, connections are made between addiction research and educational literature concerning learner preferences and cognitive learning style.

Sternberg's Triarchic Theory of intelligence (1985) and the Kolb Experiential Learning model (1984) are introduced as supporting theories for the psychoeducational component of treatment and recovery programs. This chapter offers a beginning theoretical and practical base to help describe the learning preferences of alcoholics.

Neuropsychological Factors

Ryan and Butters (1983) performed an exhaustive review of all measures used to detect cognitive dysfunction in alcoholics. Findings focused on the neurologically functioning alcoholic. Detoxified alcoholics who developed the Wernicke-Korsakoff syndrome were not considered. Research investigates three major neuropsychological factors: 1) learning and memory skills—most affected, 2) problem solving and perceptual abilities—somewhat less disrupted, and 3) functioning intellectual skills, using standardized IQ tests (Parsons, 1987).

LEARNING AND MEMORY ABILITIES

Lezak (1983) describes memory as the means by which an organism registers some previous exposure to an event or experience. A variety of functions could be involved, such as span of immediate attention, extent of learning information, and capacity for retention and retrieval of new information. Traditional test batteries may include assessment of verbal memory function (verbal automatisms, digits), letters (letter span, consonants, trigrams), nonsense syllables, use of words (learning tests, word span, auditory-verbal learning tests, word learning tests, sentence memory, paragraphs), memory recognition through verbal and recall, and tactile memory (p. 414). “The nature of the deficits underlying this diffuse dysfunction (alcoholism) has been difficult to identify” (Nixon, Paul, et al., 1998, p. 141).

Test batteries or clusters of neuropsychological measurements are administered to alcoholics and controls for more accuracy in prediction and to

understand the nature of organic brain disabilities. The Halstead Category test is often used in the Halstead-Reitan test battery to provide a measure of deductive-reasoning ability. The Category Test has been found to be unusually sensitive to brain damage as well as identifying alcoholic dependents. Variations in the selection of tests used in a battery tend to reflect the interests of their creators (Lezak, 1983, p. 562).

Brain Damage

Miller and Orr (1980) used the Wechsler Adult Intelligence Scale (WAIS) and the Halstead-Reitan neuropsychological test battery on one group of alcoholics, one brain-damaged group, and a third group of psychiatric patients. The results were compared: alcoholics resembled brain-damaged patients on Block Design, Digit Symbol, Object Assembly Performance IQ, the Category Test, Trails B, total time and localization, and overall Halstead Impairment Index. Brain-damaged patients did better than alcoholics on Picture Arrangement, Finger Oscillation, and Spatial Relations. Multivariate discriminate functions easily differentiated alcoholics from psychiatric patients but not from brain-damaged patients (p. 332); furthermore, there was a marginally significant difference between alcoholics and brain-damaged groups on the Halstead-Reitan battery. Strong group differences did remain after age effects had been removed.

A recent study by Beatty, Hames, Blanco, Nixon, and Tivis (1996) examined the vulnerability to alcoholism of the right and left hemispheres of the brain. The 'left' hemisphere is concerned with analyzing lines, angles, edges, etc., that comprise the elements or features of a display. The right hemisphere is

concerned with appreciation of the relationships among these elements, in other words configuration as related to the construction of visuospatial perception. Allocentric orientation of the right brain or visuospatial perception tests involve tasks such as mental rotation and finding embedded simple forms in more complex figures. Learning symbols or designs are also included. Other areas investigated were: attention and scanning (letter symbol cancellation task), egocentric orientation (indicating turns to the right or left on an imaginary journey), featural versus configural analysis (the Block Design Test and the Object Assembly Test from the Wechsler Adult Intelligence Scale (WIAS-R), and anterograde spatial memory (draw figures from memory and locate hypothetical cities in three imaginary states).

Two groups of alcoholics and non-alcoholic controls of comparable age and education were tested. Twenty-eight alcohol dependent subjects, identified by the Diagnostic and Statistical Manual of Mental Disorders-III-Revised (DSM-II-R), were in one group with a mean age of 39.2 years. The alcoholics and controls were tested 21-40 days after the alcoholics entered treatment. The alcoholics' performance exhibited deficits on some measures of allocentric orientation, featural or configural analysis, but no consistency on deficits in egocentric orientation or categorical or coordinate spatial judgment.

Abstinence

Newly abstinent alcoholics have shown marked improvement in neuropsychological test scores during the first weeks of not drinking alcohol. The first week of abstinence shows the greatest gain when comparing scores on

neuropsychological tests conducted weeks and months after withdrawal (Ryan & Butters, 1983; Lezak, 1995). Ryan (1980) tested memorization skills of alcoholic subjects who were abstinent for 4 weeks. Alcoholics took longer to learn a list of nouns than controls. When mnemonics were given, the alcoholic did as well as controls (Ryan & Butters, 1980).

Age

Most studies of learning and memory in alcoholics demonstrate that chronic alcoholics have learning and memory deficits several months after detoxification (Ryan & Butters, 1980). Alcoholics had lower tests scores on instruments that required subjects to learn large amounts of unfamiliar and essentially nonverbal material (Ryan & Butters, 1980).

Ryan and Butters (1980) tested two groups of younger (34-49) and older (50-59) alcohol-dependents by addressing all measures of learning and memory functions. Younger alcoholics had nearly the same scores as older alcoholics which does not prove that alcoholics age prematurely. Similarly, alcoholic men with a mean age of 37 years completed the Halstead-Reitan Neuropsychological Test Battery given by Grant et al (Grant, Adams, et al., 1979). The 82 alcoholics were abstinent for 3 weeks to 18 months. Another group was formed: 40 males who drank occasionally. Grant et al. (1979) used the Halstead-Reitan Neuropsychological Battery on the two groups to find factors attributed to premature aging rather than the normal aging process. Attention to the number of years of use of alcohol, dietary adequacy, or medical or blackout history did not relate to neuropsychological impairment.

To summarize, the examination of numerous reviews of neuropsychological factors of alcoholics over several decades, Parsons (1994) came to the same conclusion that Nixon et al. (1998) supported. The general conclusion is that sober alcoholics manifest mild to moderate impairment on tests measuring memory and learning (Parsons, 1994). Parsons (1994) pointed out wide differences in cognitive neuropsychological functions in male and female post-withdrawal alcoholics and emphasized that 20% to 40% of the alcoholics do not show performance deficits when compared to peer controls. He recommended that those alcoholics not showing deficits should be studied for differences from alcoholics who show deficits. Premature aging is not considered a result of alcoholism (p. 39).

Problem Solving and Spatial Abilities

Certain traditional neuropsychological tests to identify spatial skills and problem solving skills have remained popular throughout the last century. The Reitan (Reitan, 1958) is used as an indicator of neuropsychological dysfunction, particularly spatial functions (Lezak, 1995). Researchers use the Trails B test, where the subject traces a prescribed path of numbers and letters, as a sensitive measure of alcoholic-induced cognitive dysfunction. (Ryan & Butters, 1983). Another test is the Block Design, which provides the subject with red and white blocks, depending on the test item. Each block has two white and two red sides, and two half-red half-white sides with the colors divided along the diagonal. The task is to use the blocks to construct replicas of two block constructions made by

the examiner: eight designs on the Wechsler Adult Intelligence Scale (WAIS) (Wechsler 1955) or seven designs on the revised version of the Wechsler Adult Intelligence Scale-Revised (WAIS-R) (Wechsler 1981).

The examiner presents designs in front of the subject arranged by difficulty, which the subject must recreate. The Trails B and Block Design tests are used to identify certain neuropsychological factors and deficiencies in alcoholics such as spatial functions. Generally, high degrees of abstraction, difficult for alcoholics, are required on traditional psychometric tests. Studies in the 1970s reported that performance on non-verbal skills was poorer in alcoholics than in controls. A decade later Laine (1981) concluded that good verbal skills in alcoholics hide the degree of their neuropsychological deficits.

DYNAMIC APPROACHES TO PROBLEM SOLVING TESTS

The dynamic approach to testing, introduced by Lev Vygotsky in the late 1920s, analyzes in detail the task structure of a test, the staggered structure of instruction, and the extent of the transfer effect of instruction. Then the subject is trained in effective analysis and transfer and encouraged to apply specific knowledge and skills related to the tasks on the test. This training in the dynamic approach to instruction has been shown to establish improvement in the ability of the subject to assimilate and apply problem-solving methods. Transfer is stronger when applied to other similar tests.

Saarnio (1992) administered a dynamic Vygotskian-type test of learning potential or restoration of cognitive function. This study questions traditional

psychometric approaches for testing and measuring problem solving ability. The test investigated the alcoholic's deficits in abstraction, problem solving, and learning, rather than a traditional psychometric static test focused on brain damage. Saarnio (1992) followed Goldman's (1983, 1986, & 1987) approach which supports two key concepts of recovery of cognitive function in alcoholics: 1) spontaneous recovery (time-dependent; no help from external resources—after six months alcoholics are comparable with nonalcoholics), and 2) functional recovery (experience-dependent; providing instruction to promote recovery and/or allowing practice). Saarnio (1992) asked the general question: "Can cognitive retraining speed the course of recovery?"

Subjects were 89 client volunteers from a treatment facility who were administered a modified matrices test (MT) to measure learning potential. Two versions of Raven's Progressive Matrices (RPM), a static test, were used as the modified test for learning potential (Standard Progressive Matrices (SPM) and the Advanced Progressive Matrices (APM)). RPM is a problem-solving test requiring inductive reasoning, which can be objectively analyzed and regulated where common problem-solving strategies and specific rules of problem solving are identifiable. Subjects were taught the problem-solving rules and strategies useful to perform the MT. Instruction in accordance with the principles of dynamic testing was provided.

Results of data analysis concentrated on the possibility of using a Vygotskian dynamic concept of instruction to improve the cognitive performance of alcoholics during problem solving. Instruction improved the performance of

alcoholics in simple tasks, but not in more complicated tasks. There was marginal improvement in controls who had no instruction. As expected, very marked inter-individual differences in performance in pretest and post-tests were found indicating alcoholics can benefit from instruction, but their ability to transfer is limited, and individual variability needs more research and clarification.

ECOLOGICALLY VALID TESTING

The ‘correct’ versus ‘incorrect’ performance measures on traditional neuropsychological tests are argued to be insensitive to cognitive deficits in alcoholics. A study by Nixon and Parsons (1991) worked with a test model that used the Plant Task (not a ‘correct’ or ‘incorrect’ answer test). The study claimed that abstracting is in ‘knowledge memory’ where information is stored and utilized using language, meaning, logic, and structural relationships between events and has three processes: 1) Access – ability to extract information from memory (operation within time restraints and not increased time to respond), 2) Availability - refers to the persistence of information over time (avoided persistent incorrect answers), and 3) Efficiency – speed/accuracy tradeoffs – effective use of accurate information while irrelevant, inaccurate or interfering information is ignored (inability to ignore irrelevancy or inability to provide adequate explanations).

The subjects who completed the experiment task presented by Nixon et al. (1991) were 91 alcoholics (39 female, and 52 male) and 61 community controls (35 female and 26 male). Alcoholic subjects were qualified using the DSM-III-R.

The group of alcoholics had an average of 12.01 ± 7.14 years of alcoholic drinking and was tested between 21-45 days after entrance to treatment. Age, years of education, and Beck Depression Inventory scores were subjected to 2 (groups: alcoholics versus controls) x 2 (sex: male versus female) analysis of variance (ANOVA's). There were significant age differences with females ($M = 32.86 \pm 6.76$) being significantly younger than males ($M = 37.83 \pm 8.36$). Controls were significantly different from alcoholics in years of education with controls having more education than alcoholics and males more than females, with no significant interaction. Alcoholics were significantly different on the Beck Depression Inventory than controls.

The Plant Task was given along with Shipley Institute of Living Abstraction subscale, the Conceptual Levels Analogy Test, a shortened version of the Booklet Category Test, and the Levine Hypothesis Formulation Test.

Materials for The Plant Test required four plants in various conditions from failing to healthy. The subjects were to review each plant's condition and the accompanying food and water next to it (small glass of water or large; yellow fertilizer or blue, container of leaf lotion/or no container). Then the subject must conclude the condition of a fifth 'unseen' plant by comparing the care of the four plants to the care of the fifth unseen plant as explained by the examiner. Four questions were to be answered and explained: Alcoholics and controls were to predict the outcome of the unseen plant (question 1), and identify relevant variables (question 2). They were asked whether or not (question 3) and why

(question 4) the leaf lotion, an irrelevant variable, was pertinent or not pertinent to the fifth plant's outcome.

Overall, alcoholics performed as well as controls when relevant variables were identified, which points to no availability deficits; however, alcoholics appear less able to separate their real-world knowledge from the current situation (e.g., too much or too little water is detrimental to plant growth) by not recognizing certain details in the context of the test.

PROBLEM SOLVING STRATEGIES

Becker, Butters, Rivoira, and Miliotis (1986) assessed the behavioral parallels between alcoholics and alcoholic Korsakoff patients by examining their problem-solving deficits, often attributed to dysfunction of anterior association cortices of the brain. Becker et al. researched the formation of questions by long-term alcoholics ($n = 25$; mean age = 48.7), alcoholic Korsakoffs ($n = 9$; mean age = 60.1), and nonalcoholic controls ($n = 15$; mean age = 49.1) who were asked to solve object and digit/letter identification problems. The education mean was significantly different for all groups. Although some of the instruments in the larger battery were not included in this study, three qualifying tests were: Shipley Abstraction Test, Digit-Symbol substitutions, and Verbal fluency. On the object and digit/letter identification measure, Becker et al. (1986) hypothesized subjects would ask three types of questions to select objects, letters, or numbers which the examiner had arbitrarily chosen. They reported the following: 1) constraint-seeking questions that focused on broad categories that allowed elimination of

several stimuli (the alcoholics failed to use the constraint-seeking questions early in the problem-solving process and asked mostly questions that eliminated one alternative at a time); 2) hypothesis-scanning questions that eliminate only one possibility (the alcoholics eliminated fewer letters and numbers than nonalcoholics in the Digit/Letter task, supporting the conclusion that alcoholic subjects are significantly impaired in generating efficient, sequentially organized strategies); and 3) pseudo-constrain questions that were asked more by the alcoholics, who superficially appeared to refer to a broad category but only referred to one of the pictured objects.

As projected, inefficient problem solving strategies were observed from the long-term alcoholics and alcoholic Korsakoffs compared to the nonalcoholics. Findings in this study support the hypothesis that detoxified long-term alcoholics and alcoholics with Korsakoff's syndrome have similar difficulties on problem-solving tasks by adopting similar inefficient problem-solving strategies. Becker et al. (1986) conclude that such problem-solving deficits might explain poor judgment experienced by alcoholics in everyday situations.

SPATIAL PERCEPTION

Spatial perception involves tasks such as mental rotation and finding embedded simple figures in more complex forms. Also included are learning tasks involving symbols or designs. Research has shown that alcoholics who are abstinent experience some spontaneous recovery as time passes without external

intervention. Also, verbal dysfunction seems to recover from alcohol-induced cognitive deficits faster than spatial deficits (Ellenberg, Rosenbaum, et al., 1980).

Ellenberg et al. (1980) conducted 3-spaced administrations of verbal and spatial tasks on 3 groups of 16 alcoholics matched for age, education, and drinking history. At 5, 15, and 25 days of not drinking alcohol, respectively, verbal and spatial tasks were tested. A baseline task performance was appraised in 16 matched controls. The subjects were given new learning verbal and visual spatial paired-associate items. Results indicated verbal and visual spatial learning was impaired immediately after drinking stopped, but recovery was apparent within a 2-week period in most subjects. Older alcoholics had continued impairment through the 25 days. The implication is that older, long-term alcoholics may have greater right hemisphere damage. Repeated practice and examination of complex information processing strategies were shown as helpful in faster recovery of neuropsychological function.

Cognitive rehabilitation was used as a potential treatment enhancer in a study of four groups of alcoholics by Goldman and Goldman (1988). The researchers provided remediation training for the subjects. The instruction included three cognitive functions identified to complete the Trail Making Test B for visual spatial function: 1) scanning speed and accuracy through 18 number-letter cancellation tasks with varied spatial arrangement – the stimuli were either arranged in structured rows or randomly on the pages; the proximity between stimuli varied; 2) verbal series alternation – verbal set shifting, learning to alternate rapidly between seven pairs of progressing verbal series, and 3)

integration of scanning and symbol manipulation – using a digit-letter substitution test, similar to WAIS-R, subjects were taught the skill with and without a key (answers) concentrating on a 90-second time limit. Maximum feedback and encouragement was given subjects during the training. The training on the three tasks was conducted in two identical sessions that lasted approximately 45 minutes each. The nonalcoholic and nonremedial subjects were not in either session.

The four alcoholic groups (2 remediated and 2 nonremediated) were tested during a 19-day period, as was the nonalcoholic group used as a reference level of normative performance. The analysis supports the conclusion that neuropsychological impairment can be reversed in alcoholics with appropriate cognitive stimulation and supports “experience dependent recovery.” Results compared all five groups (a significant difference between remediated alcoholics and nonremediated alcoholics; no significant difference between remediated alcoholics and nonalcoholic). The lack of training rather than the disruption of any unitary neuropsychological function was suggested as responsible for poor test results.

ABSTRACTING ABILITY

Jones and Parsons (Jones & Parsons., 1972) asked if the impairment in abstracting ability in alcoholics involved only a specific task (identification of spatial geometric concepts) or whether a generalized deficit was present (p. 380). Chronic alcoholics and nonalcoholic controls were compared on three abstracting

tasks: the Halstead Category test, a spatial abstracting task; the Embedded Figures test, representing field dependency; and the Shipley-Hartford Institute of Living Scale, a measure of verbal abstracting ability.

Two matched groups, alcoholic and nonalcoholic, of 26 subjects each completed the four tests; the Halstead Category test and the Embedded Figures test were administered individually. The Advanced Raven's Progressive Matrices and the Shipley Institute of Living Scale was given to groups of 6 to 10 subjects. The mean age of the alcoholics was 46.54 years (range 26-61). Mean number of years drinking alcohol was 27.46 years (range 5 to 46). The data did not support the hypothesis of a general abstracting deficit in hospitalized chronic alcoholic patients. Alcoholics did significantly poorer on the Halstead Category test and were not impaired on the abstracting ability as measured by the Shipley –Hartford or the field dependency as represented by the Embedded Figures Test. Jones and Parsons (1971) pointed out that previous investigations show that alcoholic subjects do not differ significantly from controls on the Embedded Figures Test and the Rod and Frame test. The results of the Jones and Parsons (1971) investigation agree with this conclusion (p. 383).

SUMMARY

Although certain traditional neuropsychological tests have remained popular among researchers, the alcoholic's ability to problem solve has been investigated with nontraditional testing approaches such as dynamic testing developed by Lev Vygotsky in the 1920s. Also, ecologically valid tests of

abstracting and problem-solving abilities have been compared to the correct versus incorrect performances measures used for decades.

Assimilation and application are becoming more important in identifying certain neuropsychological factors of alcoholics. With cognitive training alcoholic subjects have improved performance in spatial problem-solving functions. Research has suggested the alcoholic's ability to assimilate complex information may be the end result of a lack of environmental stimulation or cognitive training rather than the disruption of any unitary neuropsychological function. More research is needed involving inquiries into inefficient problem-solving strategies that may inhibit an alcoholic from making good decisions.

Personality Variables

FIELD DEPENDENCE

Herman Witkin (1959) was the first to test alcoholics for field dependency, which, he concluded, was an aspect of cognitive style and identified as a personality variable in alcoholism research. Personality variables are a complex of mental dispositions applied to specific patterns of social, motivational, and cognitive-affective processes. Witkin (1959) found a significant number of alcoholics to be field dependent.

Witkin's (1959) test evaluated subjects who use an analytical approach (field independent) to setting the rod in a frame and found that alcoholics are most likely to think of the rod separately from the surrounding frame. Subjects who used a global approach (field dependency) are particularly prone to error with the

Rod and Frame Test (Witkin, Karp, et al., 1959). Research by other investigators generally verified a significant relationship between field dependence and alcoholism (Barnes, 1983, p. 157).

Witkin and Goodenough (1981) proposed that field independent learners have an internal frame of reference, while field dependent individuals rely on an external frame of reference. The act of cognitive restructuring demonstrates the differences between field independent and field dependent subjects in three areas: 1) providing structure for an ambiguous stimulus complex, 2) breaking up an organized field and its basic elements, and 3) providing a different organization to a field than that which is suggested by the inherent structure of the stimulus field. Field independent learners have been identified as more capable in all three areas. In addiction research literature, alcoholics are generally found to be field dependent and, therefore, less capable of structuring an ambiguous stimulus complex, breaking up an organized field, and providing different organization to a suggested organized field.

Witkin and Goodenough (1981) have described the changes over time in the field dependent-independent construct. The early work concentrated on the narrow perception of the upright through use of the rod and frame test where Witkin (1959) asked alcoholics to manipulate a rod in an illuminated frame in a dark room to the upright position. Then, subjects were questioned as to perceptual-analytic abilities. Later, competence at disembedding simple forms in a more complex pattern was associated with competence in intellectual activities extending to areas of body concept, sense of self, and controls and defenses,

which became more comprehensive and was labeled as “differentiation” (Riding & Cheema, 1991, p. 197).

Learning environments were studied in various populations and Witkin, Moore, Goodenough and Cox (1977) reported that field independent teachers prefer more formal approaches to learning as opposed to field dependent teachers who prefer frequent interactions. The field independent teacher uses questions as instructional tools, while the field dependent teacher use questions as a check on what has been learned. FI teachers emphasize their own standards while FD teachers encourage learners to form their own principles. FI teachers seem to be more critical while FD teachers emphasize a good classroom ecosystem. FI individuals are more able to deal with situations requiring impersonal analysis while FD individuals are better at situations requiring social perceptiveness and interpersonal skills.

Other important studies on the field dependence of alcoholics have been published. The theory that field dependency is a predisposing-factor to alcoholism, as opposed to the consequence theory, has never been established (Ryan & Butters, 1983, p. 159). Goldstein and Chotlos (1966) found that field dependence in a population of alcoholics as measured by the rod and frame test (RFT) was reduced significantly after 8 to 10 weeks of psychiatric treatment. This finding was supported by the results of a study done by Chess et al. (1971), which found that alcoholics became less field dependent over a period of time. Goldstein et al. (1971) examined field dependent alcoholics on a variety of perceptual and

cognitive tasks. Results of the study showed field dependent alcoholics and nonalcoholic subjects performed in much the same way.

Individual differences in EFT performance, however, appear to relate to more than differences in perceptual functioning. Numerous studies have shown that the ability to “keep things separate in experience” in the EFT, signifying in effect greater differentiation in perceptual functioning, manifests itself in congruent form in other areas of the person’s psychological activity, signifying greater differentiation in these other areas also (Witkin, Oltman, et al., 1971, p. 3).

COGNITIVE LEARNING STYLE AND ABILITY

A search has slowly developed over the past 50 years in the psychology of learning for the separation of cognitive learning “style” from cognitive learning “ability.” The term “style” is associated with fashion, the arts, sports, the media, and many academic disciplines including educational psychology. The Curry Model style of learning and cognition is connected with individuality and is used to describe an individual quality, form, activity or behavior sustained over time (Curry, 1991).

Some individuals are predominately verbal when presenting information while others are more abstract in their thinking creating images as they acquire knowledge, according to recent educational psychological journals. Riding and Cheema (1991) found over 30 learning style labels from previous research which they sorted into two principal cognitive style categories: the Wholistic-Analytic,

or processing information in wholes or parts, and the Verbal-Imagery, or representing information during thinking verbally or in mental picture.

The three layers of Curry's Onion Model (1991) begin to clarify certain cognitive and learning style dimensions that occur during the acquisition of knowledge. According to Curry, the outermost layer of the onion and the most observable element of style is labeled "instructional preferences." A learner's instructional preferences refer to choices of learning environment or "learning style." The Dunn and Dunn (1978) multidimensional model represents a respected measure of outcomes related to environmental, emotional, sociological, physical, and psychological preferences of the individual learner.

The second layer of the onion is referred to as the "information processing style." Assimilating information through cognitive processing is an important part of learning, defined in this study as cognitive style. Cognitive strategies can modify one's intellectual approach to learning during information processing. The literature of cognitive psychology reports those cognitive strategies as mental activities that people use when they study. The strategies include ways to acquire, organize, or remember incoming knowledge more effectively. The strategic techniques for learning are metacognitive as well as cognitive in nature (Park, 1995).

The innermost core of the theoretical learning style onion is cognitive "personality" style. This researcher's study makes the assumption that certain dimensions of cognitive style represent a component of the alcoholic's personality. The cognitive personality style is defined as the individual's approach

to adapting and assimilating information, which does not interact directly with the environment but is an underlying and relatively permanent personality dimension that is expressed indirectly and is apparent only when an individual's behavior is observed across many learning instances (Riding, 1997, P. 42).

SUMMARY

Due to the original research of Herman Witkin (Witkin & R., 1981), the study of cognitive learning style has moved into more investigation of perception and processing (style and ability differences). An individual's cognitive style "appears to be attuned to his capabilities and to the requirements of the environment with which he must cope" (p. 101). Although the alcoholic has been evaluated with traditional neurological tests for over 60 years, demonstrating deficiencies in learning and memory, abstract reasoning, problem solving, and spatial ability, new testing schemes for the alcohol dependent are developing, such as The Plant Test and the Vygotskian approaches to dynamic testing. These post-modern testing approaches give attention to problem solving and ecological validation. More research has been suggested to test the alcoholic's skill in real life problem solving and understanding of his or her personal learning preferences.

CHAPTER 3

METHODS

Researchers in education and alcoholism agree that there is more to intelligence than ability and more to successful problem solving than intelligence. In this study learner preference is suggested as an important and currently unidentified personality variable in the psychoeducational component of recovery from alcoholism. The four research questions in this study examine whether there is a relationship between the learning styles of alcoholics who have been alcohol free for various lengths of time and two cognitive tests and one learning inventory. For the purposes of this study learning style is defined as a way of thinking and the preferred ways of using one's abilities (Sternberg, 1997, p. 9). The four research questions are:

1. Does the length of sobriety affect the distribution of scores of alcoholics on the Group Embedded Figures Test (GEFT)?
2. Does the length of sobriety affect the distribution of scores of alcoholics on the vocabulary, abstraction, and IQ scores of alcoholics on the Shipley Institute of Living Scale (SILS)?
3. Does the length of sobriety affect the distribution of scores of alcoholics on the Kolb Learning Styles Inventory (LSI)?

4. Does the length of sobriety affect the correlation of scores of alcoholics in a negative or positive direction on the GEFT, SILS, and LSI?

Purpose

The primary purpose of this research was to study the relationship between selected neuropsychological and personality variables and cognitive learning styles of alcoholics with different lengths of sobriety.

Tests show that alcoholics have deficits in abstract-reasoning abilities, executive functions, spatial skills, and new learning and memory (Parsons, 1981; Parsons & Leber, 1981; Ryan & Butters, 1983; Parsons, 1987, 1994, & 1998). One of the most mentioned personality variables in alcoholism research is the educational concept of “field dependence,” that is, having difficulty extracting the simple figures from complex forms identified by the GEFT. Attention to more contemporary theory and practice in cognitive learning styles could not be found during extensive reviews of addiction literature. Questions need to be asked about the learning preferences of alcoholics and changes in learning styles that may be present as an alcoholic’s sobriety continues.

Results of this descriptive study may guide research for the development of more effective psychoeducational treatment and recovery methods. This study argues that learning preferences and personality variables are as important as ability when designing instruction for alcoholics.

Research Setting

This research was conducted in two southwestern cities. The three measurement instruments were administered to subjects in a classroom situation after they were recruited from Alcoholics Anonymous and local treatment centers in each respective city. The total testing time was 60 minutes to complete the 3 tests. The order of administration of the tests was random with one exception. The Group Embedded Figures Test was given last because of the disturbing aspects of the test to some alcoholics, which was demonstrated in trials previous to this study.

Subjects

The whole population in this study consisted of 146 male and female subjects ranging in age from 18 to 65 years. Of the 146 subjects tested, 126 volunteers were selected for this study, and their test results analyzed. Ethnic backgrounds were mixed. All subjects identified themselves as alcoholics. Some volunteers were self-selected and were associated with a psychoeducational treatment center for alcoholics and drug addicts. Others attended meetings of Alcoholics Anonymous and were not in treatment at time of testing. The whole group had from 0 days of sobriety to 35 years.

A large non-profit addiction treatment center in the Southwest and local meetings of Alcoholics Anonymous were approached for anonymous volunteers, who would not receive compensation. Potential subjects were recruited with an

introduction by the researcher, either individually or in a group. A verbal request to join the study was made. No court-mandated treatment subjects were recruited. No participants who could not understand conversational English or read English were recruited. The substance abuse counselors in the treatment centers approved subjects as able to give voluntary informed consent.

All subjects in substance abuse treatment centers were participants in a program of psychoeducation and self-reported being alcoholics. All alcoholics signed an “informed consent form” at the beginning of the testing session. Consent forms were collected immediately after signing. Each subject received an identification code and case number for tracking data. The subject could choose to give his or her name or remain anonymous by using only the identification number on all forms that asked for a name.

Measurement Instruments

Subjects completed a demographic instrument, two cognitive tests and one learning styles inventory (GEFT, LSI, SILS-V and SILS-A) in a relaxed classroom setting at a treatment center or meeting hall.

The Shipley Institute Vocabulary and Abstraction Subscales Tests (SILS-V and SILS-A) (Shipley, 1940) are helpful to determine mental age of subjects and has been shown to correlate with The Wechsler Adult Intelligence Scale (WAIS). The Shipley Institute Vocabulary and Abstraction Subscales Tests (1940) measure the intellectual ability and impairment of individuals 14 years of age and older. It is composed of two subtests: a 40-item Vocabulary Test that

requires the respondent to choose which of 4 listed words "means the same or nearly the same" as a specified target word, and a 20-item Abstract Thinking Test which requires the respondent to fill in numbers or letters that logically complete a given sequence. The Shipley is based on clinical and research findings which suggest that intellectual impairment differentially affects various cognitive abilities—vocabulary has proven relatively resistant to change while abstract thinking has been shown to be more susceptible to cognitive deterioration associated with brain dysfunction, mental disorders, or normal aging (Shipley, 1940). The test measures the discrepancy between vocabulary and abstract concept formation, which provides a useful measure of cognitive impairment involving brain damage and lack of abstraction skills.

The Group Embedded Figures Test (GEFT) is a measure of cognitive style (Witkin, 1959), which calls for the subject to identify a simple geometric shape from each of 18 complex forms. The test, designed originally for research in cognitive functioning and cognitive styles, has been related to analytic ability in other tasks, social behavior, body concept, preferred defense mechanisms and problem-solving style. Spatial orientation is required to complete each question. Subjects who correctly identify most of the simple forms are considered field independent while subjects who cannot identify the simple form in the complex forms are considered field dependent. Each respondent has a limited amount of time to locate and trace simple forms embedded within more complex forms. A test/retest reliability coefficient of 0.82 has been published (Witkin, 1971). This study classified those subjects as "field independent" who had 12 or more points

on the test. Those subjects with 6 or less correct were classified as “field dependent.” The 7 to 11 scores represented the intermediate (Witkin, Oltman, et al., 1971).

The Learning Styles Inventory version 3 (Kolb, 1999) is used to describe the way individuals learn from experience. The learning inventory is a 12-item randomized self-scoring format. Carl Jung’s styles or types were used as a model. The Learning Style Inventory is designed to measure the degree to which individuals display the 4 different learning styles derived from experiential learning theory (Kolb, 1984). The test is a 12-item questionnaire in which respondents describe their learning style. Each item asks respondents to rank four sentence-endings that correspond to the four learning modes (Concrete Experience, Reflective Observation, Abstract Conceptualization, and Active Experimentation). The LSI measures four learning orientations. Two combinations scores measure an individual’s preferences for abstractness over concreteness (AC-CE) and action over reflection (AE-RO).

Data

COLLECTION

Prior to administration of the 3 measurement instruments, qualified subjects answered 22 questions regarding their alcohol history, their educational history, and their personal demographics. All subjects reported on the questionnaire that they are alcoholics. The 2 cognitive measurements and 1 inventory identifying learning style, vocabulary, and abstraction skill were

administered to 146 alcoholics in various stages of sobriety. Twenty subjects did not correctly follow instructions and ultimately were not included in the analysis. Exact procedures were followed. Subjects were read, verbatim, the instructions provided by each of the instrument administration manuals.

The subjects completed the Shipley Institute Vocabulary and Abstraction Subscales Tests, the Kolb Learning Styles Inventory, and the Group Embedded Figures Test. Tests were administered in random order except that the Group Embedded Figures Test was given last.

ANALYSIS

The research objective was to locate and describe significant differences in the selected population, assuming normal distribution. Significant differences in this population will generate future research. Certain assumptions could not be met which support generalization to the whole population; no pre-tests and post-tests were given. Although variability is important, no random selection or random assignment of groups was done. The researcher worked with convenient groups from treatment centers and members of Alcoholics Anonymous. Above all, no causal influence is to be speculated.

Descriptive statistics are used to describe the basic features of the data in the study (mean, central tendency, variation, range, variance, and standard deviation). The statistics provide simple summaries about the population and the measures in the investigation. Simple graphic analysis demonstrates the results of the study. No conclusions that extend beyond the immediate data alone will be

offered. It is anticipated that the results of the study will provide a basis for further research that then may be generalized. ANOVA was employed where appropriate.

After the descriptive statistics were developed, chi-square was used to discover the goodness-of-fit (Isaac & Michael, 1995, p. 126). The nonparametric statistic will be a measure of squared deviations between observed and theoretical numbers in terms of frequencies in categories or cells of a table. The outcome measures were examined in a series of tables, which pointed to relationships of test scores. The presence of overall effects was noted, and the biggest differences were listed.

This study uses descriptive statistics and chi-square to determine if the data collected have significant relationships when presented as frequency counts. The major issues investigated involving learner preferences of alcoholics were: 1) if there are significant differences in learning styles of alcoholics with different lengths of time being clean and sober and certain selected neuropsychological factors related to problem solving, abstraction, spatial ability, and IQ score, (2) if there is a significant relationship between IQ and learning style of alcoholics, and (3) are the correlations of scores significant. Four research questions guided the study:

1. Does the length of sobriety affect the distribution of scores of alcoholics on the Group Embedded Figures Test (GEFT)?

2. Does the length of sobriety affect the distribution of scores of alcoholics on the vocabulary, abstraction, and IQ scores of alcoholics on the Shipley Institute of Living Scale (SILS)?
3. Does the length of sobriety affect the distribution of scores of alcoholics on the Kolb Learning Styles Inventory (LSI)?
4. Does the length of sobriety affect the correlation of scores of alcoholics in a negative or positive direction on the GEFT, SILS, and LSI?

Summary

This study was conducted in two southwestern cities. Subjects were recovering alcoholics with various lengths of sobriety. All subjects were volunteers from a treatment center for recovery from alcohol and drugs, or from meetings of Alcoholics Anonymous. Testing instruments were administered exactly as prescribed in the testing manuals.

The study investigated three general areas of alcoholism for further description. The major area of investigation concerned the significant differences of scores on cognitive tests and a learning styles inventory of alcoholics who had been clean and sober for different lengths of time, and certain selected neuropsychological factors. The second research area concerned the relationship of IQ scores to the cognitive tests and learning styles inventory. The third concern was the effect of abstraction skills on selection of a learning style.

The Group Embedded Figures Test (GEFT) was used to measure field dependence-independence. The Shipley Institute of Living Scale (SILS) was used to measure vocabulary and abstraction ability as correlated with The Wechsler Adult Intelligence Scale (WAIS). The third measure, the Kolb Learning Styles Inventory, was used to identify learning styles.

This descriptive study followed the research guidelines of Isaac and Michael (1997) who suggest that descriptive research describes systematically the facts and characteristics of a given population or area of interest factually and accurately (p. 50). Isaac and Michael pinpoint the characteristics of descriptive research as “an accumulation of a data base that is solely descriptive, and does not necessarily seek or explain relationships, test hypotheses, make predictions, or get at meanings and implications” (p. 50).

CHAPTER 4

RESULTS

In this chapter the contextual data and the descriptive statistics with analysis of variance are related to each of the four research questions:

1. Does the length of sobriety affect the distribution of scores of alcoholics on the Group Embedded Figures Test (GEFT)?
2. Does the length of sobriety affect the distribution of the vocabulary and abstraction scores of alcoholics on the Shipley Institute of Living Scale (SILS)?
3. Does the length of sobriety affect the distribution of scores of alcoholics on the Kolb Learning Styles Inventory (LSI)?
4. Does the length of sobriety affect the correlation of scores of alcoholics in a negative or positive direction on the GEFT, SILS, and LSI?

Grouping of Subjects

Researchers have determined that certain variables and test scores show marked improvement during the first four weeks of sobriety and continue to improve months and sometimes years after the first weeks if alcohol is not consumed (Ryan & Butters, 1983). The 126 participants in this study were divided into two groups based on sobriety dates, ethnicity, education and the

scores on three measures (GEFT, SILS, and LSI). Two main sobriety groups were formed: 28-days or less; 29-days or more. Two subgroups were formed 14-days or less; 15 to 28-days. Ethnicity was partitioned into two groups: white-non-Hispanic; Other. The level of education was reduced to 3 groups: bachelors and above; some college; high school and below. The data from the GEFT was used to form three groups identifying spatial ability: high = 18-14 correct; middle = 13-6 correct; and low = 5 or less correct.

Finally, the LSI scores were divided into four quadrants: concrete experience (feeling-CE); reflective observation (watching-RO); abstract conceptualization (thinking-AC); active experimentation (doing-AE). Then a point of intersection of an x and y score was computed for each subject to identify a specific learning style sector. The means of the four LSI scores were used to prepare 2 graphs which identify a learning style type for the whole sample.

Demographics and Contextual Variables

Selected ethnic and contextual variables (environments in which a person lives) (Sternberg, 1985, p. 329) were explored to describe the group's participation in treatment and recovery programs, as well as education and general performance in school. These variables included admittance to a treatment center, attendance at Alcoholics Anonymous meetings, years of education, and certain environmental variables which may be present while learning.

Ethnicity and Gender

The final sample, as presented below in Table 4.1, was represented by 126 subjects of which 71% were white-non-Hispanic and 29% were classified as “Other.” Since the subjects were given the option of not answering questions, one subject left the question blank and was counted as missing and included in the “Other” category.

Table 4.1: Ethnicity of Total Sample

Do you consider yourself:			
		Frequency	Percent
Valid	White, Non-Hispanic	96	76.2
	Black, Non-Hispanic	8	6.3
	Hispanic Mexican	9	7.1
	Hispanic Other	2	1.6
	American Indian	3	2.4
	Other	7	5.6
	Total		125
Missing	System	1	.8
Total		126	100.0

The largest ethnic group in the sample was the 96 white-non-Hispanic alcoholics. The second largest group was the 11 Hispanic alcoholics. The third was Black with 8 alcoholics. 7 subjects identified themselves as “Other.” 3 alcoholics were represented as American Indian.

There were more male gender than female (82 males or 65 %; and 44 females or 35%). Gender difference was not significant in this study.

TREATMENT FACILITY

Of the total subjects in the study 83% had been through a treatment program (see Table 4.2).

Table 4.2: Treatment for Alcoholism in a Controlled Environment

Have you ever in your life been in a treatment facility for drugs or alcohol?

		Frequency	Percent	Valid Percent
Valid	Yes	105	83.3	83.3
	No	21	16.7	16.7
Total		126	100.0	100.0

ALCOHOLICS ANONYMOUS MEETINGS

One hundred and seventeen subjects indicated they believed in a “higher power.” A majority of these alcoholics, 75 subjects (60%), attend at least two to five recovery meetings a week (see Table 4.3).

Table 4.3: Attendance at Alcoholics Anonymous

**Over the last year, on average how many AA meetings
have you attended per week?**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	One or less per week	51	40.5	40.5
	Two to four per week	46	36.5	77.0
	Five or more per week	29	23.0	100.0
	Total	126	100.0	100.0

EDUCATION

The amount of education and performance in school was considered. Two subjects had doctoral degrees (2%), 7 had Master's or Professional Degrees (6%), 22 had Bachelor's Degrees (18%), 10 had Associates Degrees (8%), and 43 subjects had some college. There were 33 subjects who stopped formal education after graduation from high school, 33% of the total group. The three groups formed for analysis of educational experiences were composed of high school or less=40%, some college=35%, and bachelors and above=25%.

LEARNING ENVIRONMENTS

Other contextual variables were examined including individual behavior in school, self-performance grade evaluation, and impressions of one's self as a learner. A total of 62 subjects (49%) said they caused some degree of problems in the classroom (see Table 4.4).

Table 4.4: Behavior Problem Caused in the Classroom by Sample

During your days in primary and/or secondary school, how often did you cause problems in the classroom?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	16	12.7	12.7	12.7
	Rarely	48	38.1	38.1	50.8
	Occasionally	35	27.8	27.8	78.6
	Frequently	21	16.7	16.7	95.2
	Always	6	4.8	4.8	100.0
	Total	126	100.0	100.0	

The researcher presented questions to the subject about being misunderstood in school. Of the total volunteers, 39% were “rarely” or “never” misunderstood by their teachers (see Table 4.5).

Table 4.5: Subjects Misunderstood by Teachers

How often did you feel that your teachers in primary or secondary school misunderstood you?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	7	5.6	5.6	5.6
	Rarely	32	25.4	25.4	31.0
	Occasionally	46	36.5	36.5	67.5
	Frequently	30	23.8	23.8	91.3
	Always	11	8.7	8.7	100.0
	Total	126	100.0	100.0	

Members of the group (66%) had never been assessed for learning preferences with any type of measurement. Although only 22% reported no fear

when completing an academic test, the other 78% had some amount of fear ranging from “extremely fearful” to “somewhat fearful.” Eighty-nine percent (89%) wanted to return to school for more education. The total number of alcoholics who rated themselves as “good” to “excellent” learners was 99 subjects (78%). Of the total subjects in the study 105 described their personality as “quiet” (35%) or “outgoing” (48%) and indicated they were “friendly” as opposed to “unfriendly” in high school. There were 27 subjects (25%) who indicated they were involved in acts of violence of in school with 94 people who said “rarely” (36%) and “never” (39%).

Examination of Variables

Prior to analysis of variables, the researcher examined the distribution of the variables to assess the assumptions of the tests that will be used.

Distribution

A common first step in the analysis of data is to examine the distribution of the variables involved. This study examined commonly used statistics Kurtosis (i.e., the peakedness hi or lo) and skewness (i.e., the deviation from symmetry – negative or positive).

The kurtosis and skewness of the SILS-Vocabulary (see Figure 4.2) and the SILS-Abstract scores (see Figure 4.3), as well as the converted IQ scores were computed. Significant skew is identified by an absolute score of 3 whereas significant kurtosis is identified by a value of 8. No variables significantly

departed from normality. Kurtosis for the SILS-V (vocabulary) T-scores was .016 with a standard deviation of 10.521 (see Figure 4.2) while the SILS-A (abstract) scores were more flat at -.238 (see Figure 4.3) with a standard deviation of 8.663 (relative to a normal distribution). Group Embedded Figures Test had a Kurtosis of -1.414 and a skewness of -.015 (see Figure 4.4).

Figure 4.1: Histogram of Shipley Vocabulary T-Score

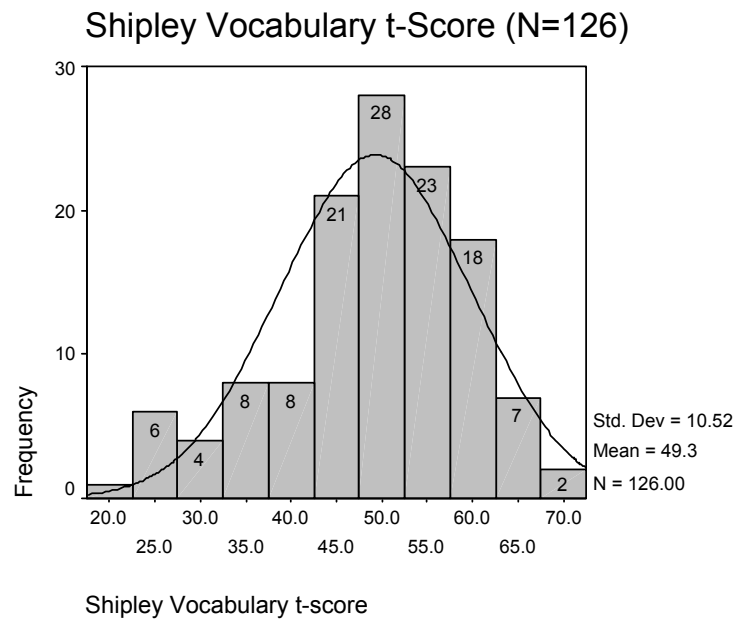


Figure 4.2: Histogram of Group SILS Abstract T-Score

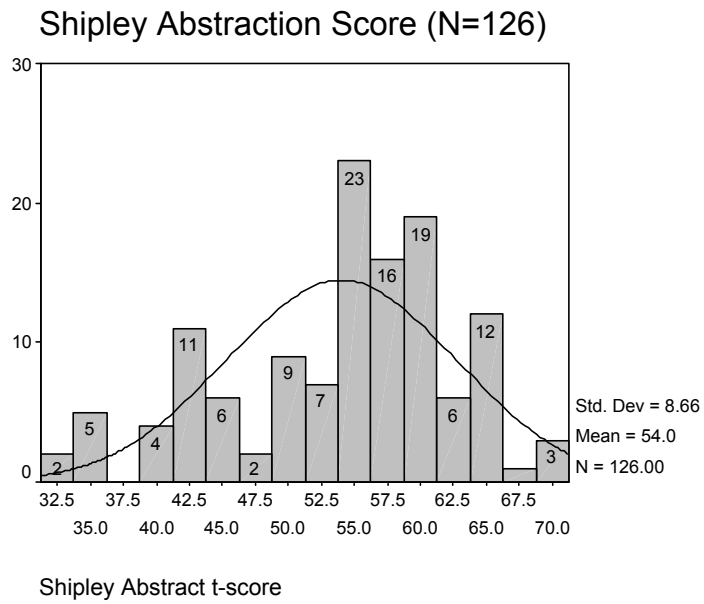
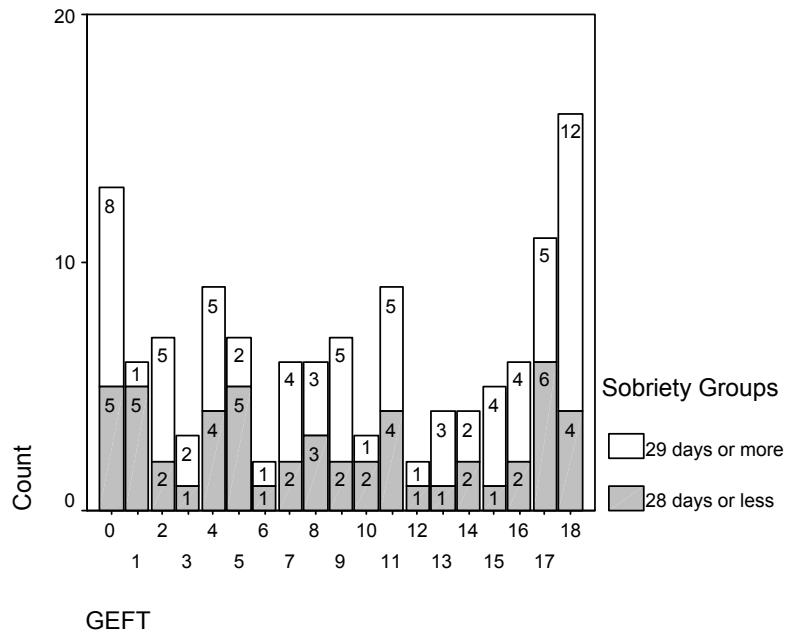


Figure 4.3: Histogram of Two Sobriety Groups GEFT Scores



Research Questions

QUESTION ONE

Does the length of sobriety affect the distribution of scores of alcoholics on the Group Embedded Figures Test (GEFT)?

This first question was related to the length of sobriety and compared to the scores on the GEFT, a perceptual task test designed to challenge a participant to find a hidden simple figure within a complex design. “Alcoholics are more field-dependent than “normals” (Barnes, 1983, p. 157). Alcoholics do not normally have a high score on the GEFT (p. 157).

The Group Embedded Figures Test (GEFT) provides 18 complex figures for the subject to examine. As a perceptual test to assess spatial skills, the subject has the task to locate a previously seen simple figure, which is obscured or embedded, within the larger complex figures. When the simple figure is traced with a pencil, the subject receives 1 point. The total points range from 0 to 18. Table 4.6 shows the mean, standard deviation, and variance of the GEFT scores for the 126 alcoholics in this study. The mean for the group was 9.3 which represents a score neither field dependent or field independent but directly in the middle of the scores. A large variance was evident in the GEFT scores at 6.297.

Table 4.6: GEFT Mean, Standard Deviation, Variance for Population Studied

Descriptive Statistics for GEFT		
GEFT		
N	Valid	126
	Missing	0
Mean		9.30
Std. Deviation		6.297
Variance		39.652
Skewness		-.015
Std. Error of Skewness		.216
Kurtosis		-1.414
Std. Error of Kurtosis		.428

Chi-square was used to find the significant relationships of two categorical variables, the two main sobriety groups (28 days or less; 29 days or more) and the GEFT scores (high, middle, low). There was no significant difference at the .05 level ($\chi^2(2, N = 126) = .466, p > .05$).

Chi-square was used to identify significant relationships of two more categorical variables, the two sobriety subgroups of the 28 days or less scores for the GEFT (0 to 14 days; 15 days to 28 days). The chi-square results with the independent variables 0 to 14 days and 15 days to 28 days by GEFT scores (high, middle, low) were no significant relationships ($\chi^2(2, N = 53) = .541, p > .05$).

Ethnicity

Chi-square was used to test the significant relationships of the two main ethnicity groups (white-non-Hispanic, N = 96; other, N = 30) and the GEFT scores (high, middle, low). There was a significant difference at the .01 level ($\chi^2(2, N = 126) = .004, p < .05$).

Education

Chi-square was used to find the significant relationships of the 3 education groups (high school or less; some college, bachelor's and above) and the GEFT scores (high, middle, low). There was a significant difference at the .01 level ($\chi^2(4, N = 126) = .004, p < .05$).

QUESTION TWO

Does the length of sobriety affect the distribution of the vocabulary, abstraction, and IQ scores of alcoholics on the Shipley Institute of Living Scale (SILS)?

The second research question was directed by the findings of Parsons and Leber (Parsons & Leber, 1981) who discovered in a metanalysis of alcohol-related studies that “research on cognitive functioning in alcoholics usually is conducted after the withdrawal syndrome has subsided and during treatment programs of several weeks to several months duration.” (p. 326).

The subjects completed the Shipley Institute of Living Scale (SILS), which consists of two major sections, a 40-item vocabulary test and a 20-item test of abstract thinking. The 2 tests were used to generate 3 summary T-scores: a vocabulary T-score, an abstraction T-score, and an IQ score based on the Wechsler Adult Intelligence Scale-Revised (Wechsler, 1981).

This study used an overall summary of scores approach to analysis. Vocabulary, Abstraction, and Total Raw scores were acquired by summing the number of correct responses for each scale. The Vocabulary and Abstraction scores had a correction factor for any omitted items. The corrected Raw Scores were converted to normalized T-scores and percentile rank equivalents. The Raw Scores and Appendix A of the SILS testing manual (Zachary, 1986) were used to determine the Vocabulary and Abstraction T-score for each subject. The T-score is a standard score with a mean of 50 and a standard deviation of 10. Scores above 50 represent above average scores. The IQ score was determined from a

conversion table in the SILS manual (Zackary, 1986) which listed normed results determined from individually administered instruments used as part of a cognitive assessment and general psychological (neuropsychological) assessment to measure capacity for intelligent behavior (Wechsler, 1981).

Table 4.7 displays the mean, standard deviation, and variance of the three SILS T-scores for this study. The means of the three individual tests of the SILS T-scores were computed. Dalton and Dubnicki (1981) reported normed scores of a sample of 376 alcoholic inpatients in a municipal hospital with a mean age of 39.2 years of age. The aged corrected mean for the T-scores of the sample for the SILS vocabulary (T-score = 38) and abstraction score (Abstract T-score = 43) was located on the conversion table for the WAIS-R full scale IQ of 94. No length of sobriety was given. The whole group SILS scores showed means above the data given in a study of alcoholics cited by Zachary (1986) in the SILS test manual (Dalton & Dubnicki, 1981).

Table 4.7: Shipley Scores: Mean, Standard Deviation, and Variance for Sample

Descriptive Statistics-Whole Group				
		Shipley IQ score	Shipley Vocabulary t-score	Shipley Abstract t-score
N	Valid	126	126	126
	Missing	0	0	0
Mean		99.75	49.29	54.01
Std. Deviation		12.127	10.521	8.663
Variance		147.067	110.686	75.048

When the whole group was separated into the two subgroups, the means were lower for the subgroup with less sobriety. Descriptive statistics for the total sample of the 28 days or less group were calculated for the SILS. The mean of the Shipley IQ score was 96.91 (SD=11.805), Vocabulary T-score=46.68 (SD=10.18), and the Abstract T-score=51.87 (SD8.392). The scores on the SILS for second group, 29 days or more, were calculated. The mean of the Shipley IQ score was 101.82 (SD=12.015), Vocabulary T-score=51.18 (SD=10.429), and the Abstract T-score=55.56 (SD8.580).

Analysis of variance (ANOVA) was used to estimate the main effects and potential interaction of sobriety on the 3 SILS T-scores for the whole sample (28 days or less; 29 days or more). Leven's homogeneity of variance was not significant for all three models. Each of the three scores showed a significant difference at the .05 level (see Table 4.8) (Vocabulary= $F(1, 124) = 5.832$, $p = .017$, Abstract= $F(1, 124) = 5.797$, $p = .018$, IQ Score= $F(1, 124) = 5.217$, $p = .024$) (see Table 4.8)

Table 4.8: ANOVA and Sobriety SILS Scores for Whole Sample

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Shipley Vocabulary t-score	Between Groups	621.482	1	621.482	5.832	.017
	Within Groups	13214.232	124	106.566		
	Total	13835.714	125			
Shipley Abstract t-score	Between Groups	418.944	1	418.944	5.797	.018
	Within Groups	8962.048	124	72.275		
	Total	9380.992	125			
Shipley IQ score	Between Groups	742.160	1	742.160	5.217	.024
	Within Groups	17641.213	124	142.268		
	Total	18383.373	125			

ANOVA was used to analyze the difference in means of the three SILS scores and the two sobriety subgroups of 28 days or less (0 to 14 days; 14 to 28 days). The independent variable was the two subgroups. The dependent variable was the 3 SILS scores. There were no significant differences in the two subgroups at the .05 level (see Table 4.9)

Table 4.9: ANOVA Interaction of Sobriety and SILS Scores for Subgroups

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Shipley Vocabulary t-score	Between Groups	48.477	1	48.477	.463	.499
	Within Groups	5335.070	51	104.609		
	Total	5383.547	52			
Shipley Abstract t-score	Between Groups	2.229	1	2.229	.031	.861
	Within Groups	3659.846	51	71.762		
	Total	3662.075	52			
Shipley IQ score	Between Groups	38.061	1	38.061	.269	.606
	Within Groups	7208.467	51	141.342		
	Total	7246.528	52			

Ethnicity

This study supported the idea that ethnicity is recognized as an important measure of differences between groups of people. The two groups formed for ethnicity were arbitrarily decided as those who classified themselves as “white-non-Hispanic” and the rest of the group members were considered “Other.” The total “white-non-Hispanic” population (96 subjects) had a higher mean score for the Shipley IQ of 102.75 (SD=9.89) and Other (30 subjects) 90.17 (SD=13.73). The mean for the vocabulary T-scores was higher for white-non-Hispanic 51.56 (SD=8.83) than and for Other, 40.83 (SD=11.17). The abstraction T-score was higher for white-non-Hispanic, 55.64 SD=7.58, than for Other, 48.80 (SD=9.92).

For the 28 days or less group, the mean for the white-non-Hispanic group on the SILS was IQ score was higher at 99.21 (SD=11.56) than for Other, 91.07 (SD=10.65). The mean for the vocabulary T-scores was higher for white-non-Hispanic, 48.47 (SD=9.24), than for Other, 42.13 (SD=11.319). The abstraction T-score was higher for white-non-Hispanic, 55.64 ((7.581), than Other, 49.53 (SD=8.48).

The means of white-non-Hispanic were also higher than Other for the 29 days or more group. The mean for the white-non-Hispanic on the SILS was IQ score of 101.82 (SD=12.015) and Other, 91.07 (SD=10.65). The mean for the vocabulary T-scores was 48.47 (SD=9.24) for white and 42.13 (SD=11.319) for non-white. The abstraction T-score was 52.79 (SD=8.29) for white=non-Hispanic and 49.53 (SD=8.48) for Other.

ANOVA was used to analyze the difference in means for the whole sample between the SILS vocabulary, abstract, and converted IQ scores as related to ethnicity. The independent variable was the two main ethnicity groups (white-non-Hispanic and Other). The dependent variable was the vocabulary, abstract, and converted IQ scores. The test of homogeneity of variances was met for all three groups. The three scores showed a significant difference at the .01 level (Vocabulary= $F(1, 124) = 31.646$, $p = .000$; Abstract= $F(1, 124) = 15.930$, $p = .000$; IQ Score= $F(1, 124) = 30.397$, $p = .000$) (see Table 4.10).

Table 4.10: ANOVA – IQ, SILS-Voc and Abs T-scores for Ethnicity of Group

ANOVA-IQ, SILS-Voc and Abs T-scores (Ethnicity) for Group						
		Sum of Squares	df	Mean Square	F	Sig.
Shipley IQ score	Between Groups	4044.374	5	808.875	6.944	.000
	Within Groups	13861.978	119	116.487		
	Total	17906.352	124			
Shipley Vocabulary t-score	Between Groups	3025.372	5	605.074	6.852	.000
	Within Groups	10509.156	119	88.312		
	Total	13534.528	124			
Shipley Abstract t-score	Between Groups	1282.930	5	256.586	3.839	.003
	Within Groups	7952.718	119	66.830		
	Total	9235.648	124			

ANOVA was used to analyze the difference in means of the three SILS scores and the two ethnicity subgroups (white-non-Hispanic and other) for the 28 days or less group (0 to 14 days and 15 to 29 days). The independent variable was the two ethnicity groups. The dependent variable was the 3 SILS scores. The test of homogeneity of variances was met. There was a no significant differences in at the .05 level (Vocabulary= $F(1, 55) = 2.507$, $p = .119$; IQ Score= $F(1, 55) =$

2.032, $p = .165$). The abstract T-score was not significant (Abstract= $F(1, 55) = .979$, $p = .327$)(see Table 11).

Table 4.11: ANOVA-IQ, SILS-Voc and Abs t-Scores –28-Days or Less – Subgroups Ethnicity

ANOVA - IQ, SILS-Voc and Abs t-Score (Ethnicity)						
		Sum of Squares	df	Mean Square	F	Sig.
Shipley IQ score	Between Groups	399.090	1	399.090	2.032	.160
	Within Groups	10800.840	55	196.379		
	Total	11199.930	56			
Shipley Vocabulary t-score	Between Groups	337.607	1	337.607	2.507	.119
	Within Groups	7407.059	55	134.674		
	Total	7744.667	56			
Shipley Abstract t-score	Between Groups	93.820	1	93.820	.979	.327
	Within Groups	5268.425	55	95.790		
	Total	5362.246	56			

ANOVA was used to analyze the difference in means of the 3 SILS scores and the 2 ethnicity groups (white-non-Hispanic and other) for the 29 days or more group. The independent variable was the two ethnicity groups (white-non-Hispanic, $N = 57$; other, $N = 16$). The dependent variable was the 3 SILS scores. The test of homogeneity of variances was not met at the .01 level. Accepting the ANOVA as robust in this instance, the SILS scores were significant at the .01 level (Vocabulary= $F(1, 71) = 27.770$, $p = .000$; Abstract= $F(1, 71) = 20.582$, $p = .000$).

Education

ANOVA was used to analyze the difference in means of the 3 SILS scores and the 3 education groups (high school or less; some college, bachelor's and

above) for the whole sample group (N = 126). The independent variable was the 3 education groups. The dependent variable was the 3 SILS scores. The 3 scores were significant at the .01 level (Vocabulary= $F(1, 124) = 31.646, p = .000$; Abstract= $F(1, 124) = 15.930, p = .000$; IQ Score= $F(1, 124) = 30.397, p = .000$). The test of homogeneity of variances was met at the .01 level with the SILS vocabulary T-score ($p < .043$) and the abstraction T-score ($p < .014$). The IQ score did not meet the assumption of homogeneity of variances ($p < .003$). Equal variances of the vocabulary and abstraction T-scores were not rejected, using the .01 level. The study accepts that failure to meet the assumption of homogeneity of variances is not fatal to ANOVA in some cases, which is relatively robust.

ANOVA was used to analyze the difference in means between the SILS vocabulary, abstract, and converted IQ scores as related to education and the 28 days or less group. The independent variable was the three education groups. The dependent variable was the vocabulary, abstract, and converted IQ scores. The test of homogeneity of variances was met for all three groups. The 3 SILS scores were significant at the .05 level ((Vocabulary= $F(2, 50) = 5.126, p = .000$; Abstract= $F(2, 50) = 4.444, p = .000$; IQ Score= $F(2, 50) = 8.928, p = .000$).

ANOVA was used to analyze the difference in means between the SILS vocabulary, abstract, and converted IQ scores as related to education and the 29 days or more group. The independent variable was the three education groups. The dependent variable was the vocabulary, abstract, and converted IQ scores. The test of homogeneity of variances was not met for all three groups. The 3 SILS

scores were significant at the .00 level ((Vocabulary= F (2, 72) = 12.575, p =.000; Abstract= F (2, 72) = 10.803, p =.000; IQ Score= F (2, 72) = 30.397, p =.000).

QUESTION THREE

Does the length of sobriety affect the distribution of scores of alcoholics on the Kolb Learning Styles Inventory (LSI)?

Research question three initiated an exploration of the length of sobriety and the Kolb LSI, which measured the subject's relative emphasis on each of four modes of the learning process—concrete experience, reflective observation, abstract conceptualization, and active experimentation (Kolb, 1999, p. 68). Parsons (1987) made the observation that alcoholism research does point to the importance of individual differentiation: “results suggest that differences in samples such as long-term vs. short-term duration of abuse may interact with type of task resulting in inconsistent findings” (p. 717).

Four scores were generated from the answers to 12 questions on the Kolb LSI (Kolb, 1984) to indicate how much the alcoholic subject relied on each of four different learning modes: CE = Concrete Experience-feeling, RO = Reflective Observation-watching, AC = Abstract Conceptualization-thinking, AE = Active Experimentation-doing. The higher the scores on the LSI indicated more interest in the specific LSI sector (Likert scale of 1 to 4 = “least like the subject” to “most like the subject. A score of 48 total points in a learning mode would represent the best possible preferred to 12 points in a learning mode for absolute

least preferred). The mean, standard deviation, and variance of the four LSI preference scores for the whole sample are shown in Table 4.12.

Table 4.12: Kolb Learning Styles Inventory Scores - Four Learning Orientations: Mean, Standard Deviation, and Variance for Whole Sample

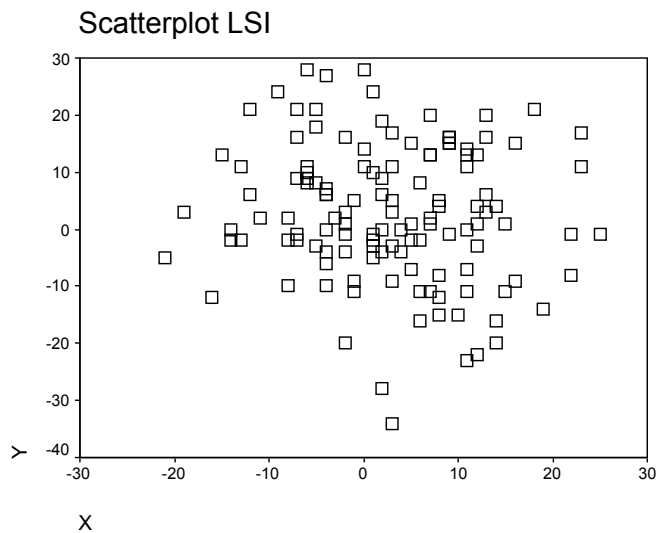
Descriptive Statistics					
		LSI_CE	LSI_AC	LSI_RO	LSI_AE
N	Valid	126	126	126	126
	Missing	0	0	0	0
Mean		26.96	29.67	30.16	32.90
Std. Deviation		6.746	7.762	5.929	5.712
Variance		45.510	60.253	35.159	32.621

No studies were found that normed the scores on the LSI for only alcoholics. A study of 1,446 adults between the ages of 18 and 60 was conducted by Kolb (2000). The means and standard deviations were: LSI_CE = 26.00, SD = 6.8; LSI_AC = 30.28, SD = 6.7; LSI_RO = 29.94, SD = 6.5; LSI_AE = 35.37. Independent t-tests were conducted and the results showed one mean of the Kolb (2000) study, LSE_AE, significantly different at the .01 level. The Kolb (2002) study showed the means of the x and y scores to locate a learning style sector (x (AE-RO) = 5.92; y (AC-CE) = 4.28). This study was x = 2.72 and y = 2.74

To correlate the scores for each subject in this study, a representation of the concept of the LSI was examined by locating the scores on a scatterplot. Two continuous variables were calculated using the four scores (AC minus CE = X and AE minus RO = Y). The predictor variable (Active to Reflective) was located on the x axis, while the criterion variable (Concrete Experience to Abstract Conceptualization) was located on the y axis. The criterion variable represents

the behavior to be predicted. The predictor variable represents the activity which is believed to be associated with the criterion. The x and y information from each subject represented one dot on the graph in Figure 4.1. Taken together, if these dots form a regression line the nature of the relationship between the predictor and criterion variables is specified. There was no significant correlation of x and y scores with this group of alcoholics.

Figure 4.4: Scatterplot of LSI Predictor and Criterion Variables for Whole Group



ANOVA was used to analyze the difference in means of the four LSI scores and the two sobriety groups of 28 days or less and 29 days or more. The independent variable was the two subgroups. The dependent variable was the 4 SILS. The test of homogeneity of variances was met. There were no significant differences in the two sobriety groups at the .05 level.

Ethnicity and Education

The examination of the LSI scores for all sobriety groups in this study revealed no significant differences in all the groups of scores.

QUESTION FOUR

Does the length of sobriety affect the correlation of scores of alcoholics in a negative or positive direction on the GEFT, SILS, and LSI?

Research question four assessed potential associations of the length of sobriety and the correlation of scores on the GEFT, SILS, and LSI.

The Pearson Product Moment Correlation was used to determine the correlation between two variables to reflect the degree to which the variables are related. Correlations were expected on the SILS T-scores and the GEFT. Both static tests rely the use of personal abstraction skills (Sternberg, 1996). Scores on the two tests (SILS and GEFT) for the whole sample did have positive correlations at the .01 level (see Table 4.13).

Table 4.13: Pearson Correlations of SILS and GEFT for Whole Sample

Correlations					
		Shipley Vocabulary t-score	Shipley Abstract t-score	Shipley IQ score	GEFT
Shipley Vocabulary t-score	Pearson Correlation	1	.570**	.755**	.267**
	Sig. (2-tailed)	.	.000	.000	.002
	N	126	126	126	126
Shipley Abstract t-score	Pearson Correlation	.570**	1	.893**	.527**
	Sig. (2-tailed)	.000	.	.000	.000
	N	126	126	126	126
Shipley IQ score	Pearson Correlation	.755**	.893**	1	.500**
	Sig. (2-tailed)	.000	.000	.	.000
	N	126	126	126	126
GEFT	Pearson Correlation	.267**	.527**	.500**	1
	Sig. (2-tailed)	.002	.000	.000	.
	N	126	126	126	126

** . Correlation is significant at the 0.01 level (2-tailed).

Scores for the 28 days or less group have positive correlations at the .01 level with the exception of two scores: GEFT and the SILS vocabulary scores ($r = .490$, $p > .05$). Table 4.14 shows all the correlations for the two sobriety subgroups.

Table 4.14: Pearson Correlations for Two Sobriety Subgroups (28 Days or Less)

Correlations					
		Shipley Vocabulary t-score	Shipley Abstract t-score	Shipley IQ score	GEFT
Shipley Vocabulary t-score	Pearson Correlation	1	.421*	.608*	.097
	Sig. (2-tailed)	.	.002	.000	.490
	N	53	53	53	53
Shipley Abstract t-score	Pearson Correlation	.421*	1	.870*	.618*
	Sig. (2-tailed)	.002	.	.000	.000
	N	53	53	53	53
Shipley IQ score	Pearson Correlation	.608*	.870*	1	.548*
	Sig. (2-tailed)	.000	.000	.	.000
	N	53	53	53	53
GEFT	Pearson Correlation	.097	.618*	.548*	1
	Sig. (2-tailed)	.490	.000	.000	.
	N	53	53	53	53

** . Correlation is significant at the 0.01 level (2-tailed).

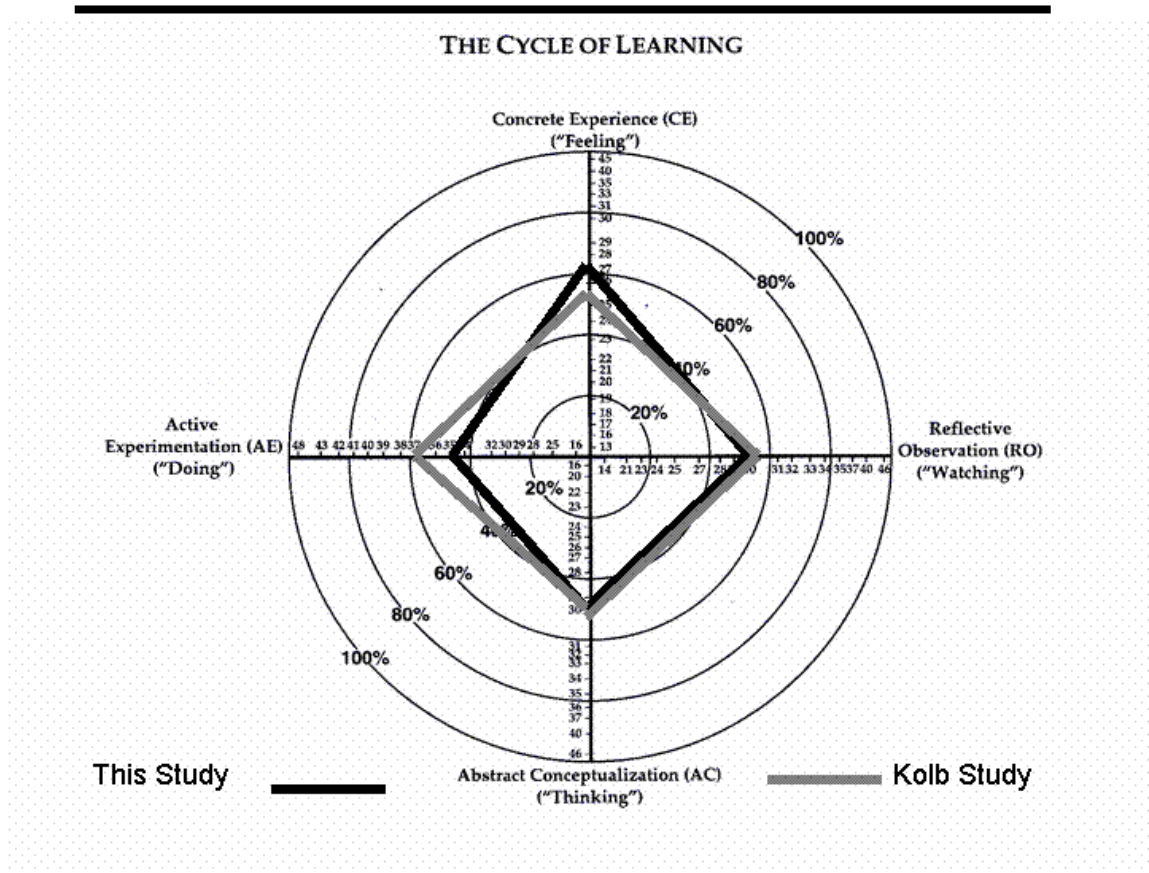
The Pearson Product Moment Correlation was used to correlate the four LSI scores with the SILS and GEFT scores. There were no positive correlations.

LSI Cycle of Learning Graphs for Group

PLOT OF LSI SECTOR SCORES

Means for this study of the four learning style modes CE (M=26.96), RO (M=30.16), AC (M=29.67), AE (M=32.90) were plotted for the group in Figure 4.5 (solid line). The Kolb (2000) study scores are also plotted (broken line); LSI_CE = 26.00, SD = 6.8; LSI_RO = 29.94, SD = 6.5; LSI_AC = 30.28, SD = 6.7; LSI_AE = 35.37. (see Figure 4.5)

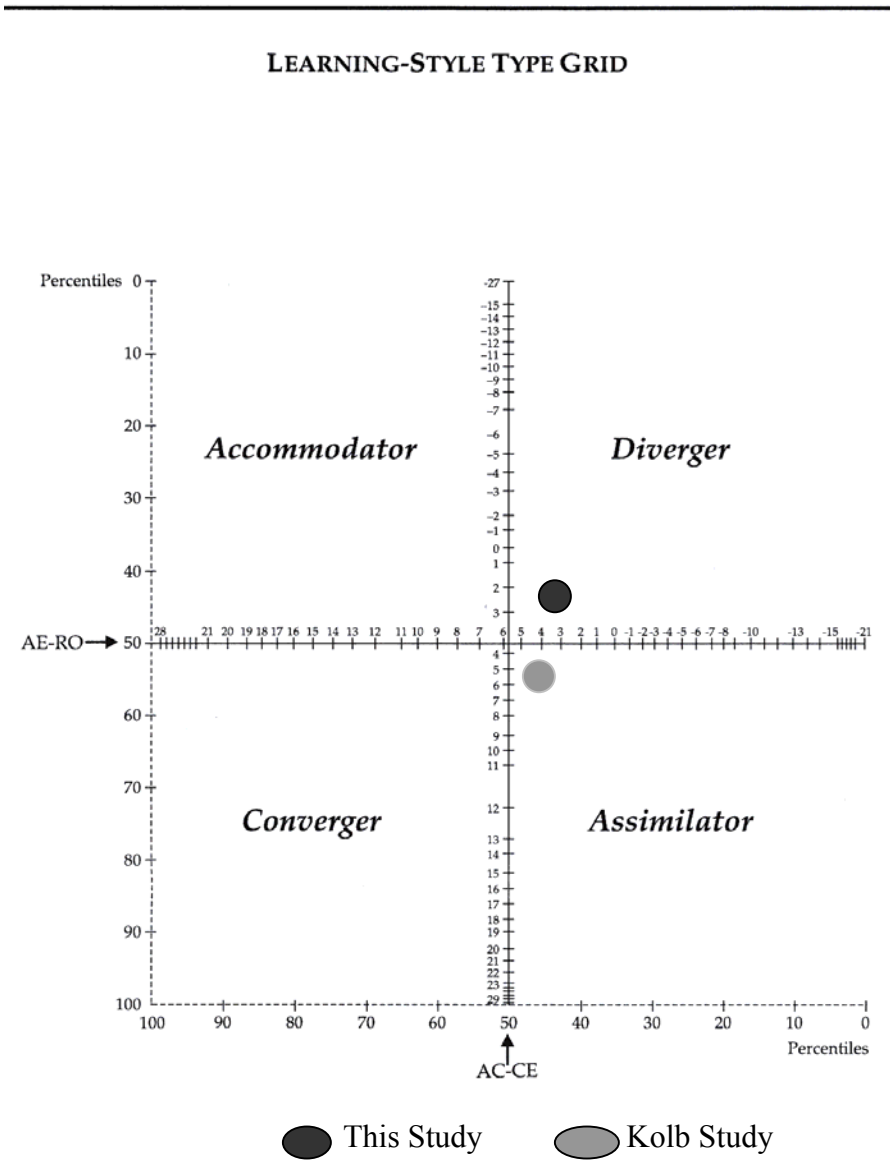
Figure 4.5: Plotted Means for Four LSI Scores on This Study and Kolb (2002)



Dominant Learning Style Type for Group

The four scores were combined to explain which of the four dominant learning style types best describes the group in this study. The means of the four scores for the four learning modes were computed for this study; $x = 2.72$; $y = 2.74$. The x and y scores of the Kolb (2000) study were plotted; x (AE-RO) = 5.92; y (AC-CE) = 4.28. The results are shown in Figure 4.6. No specific learning style sector was absolutely clear for either group since the mean scores were too close to the center of the graph.

Figure 4.6: Plotted Mean Scores for x and y Axes for This Study and Kolb (2002)



CHAPTER 5

DISCUSSION

This descriptive study focused on the theories of learning and personality variables as central issues in designing psychoeducational recovery programs for alcohol dependents. Four research questions were asked to investigate the effects of sobriety on certain neurological factors (learning and memory, abstract reasoning and problem solving) and selected personality variables (learner preferences associated with individual styles of learning). Four research questions were addressed.

1. Does the length of sobriety affect the distribution of scores of alcoholics on the Group Embedded Figures Test (GEFT)?
2. Does the length of sobriety affect the distribution of the vocabulary, abstraction, and IQ scores of alcoholics on the Shipley Institute of Living Scale (SILS)?
3. Does the length of sobriety affect the distribution of scores of alcoholics on the Kolb Learning Styles Inventory (LSI)?
4. Does the length of sobriety affect the correlation of scores of alcoholics in a negative or positive direction on the GEFT, SILS, and LSI?

The 126 subjects in the study were self-identified alcoholics from a large treatment center and from meetings of Alcoholics Anonymous (AA). Two cognitive tests (SILS and GEFT) and one learning inventory (the Kolb LSI) were

administered, and the data were analyzed with SPSS. Three areas of discussion in this chapter are related to the four research questions: (1) independence of personality and neuropsychological variables, (2) issues of curriculum and instruction, and (3) dynamic assessment as an psychoeducational pedagogy.

Independence of Personality and Neuropsychological Variables

Miller (1991) pointed out the researchers' emphasis on "more clinically sound and cost-efficient forms of substance abuse treatment" as the reason for the "neglect of important subject variables—characteristics of the clients or patients—that may influence recovery and relapse" (p. 277). This study defined cognitive learning styles and length of sobriety of alcoholics as "subject variables."

RESEARCH QUESTION ONE

Does the length of sobriety affect the distribution of scores of alcoholics on the Group Embedded Figures Test (GEFT)?

Embedded Figures tests have been used as a measure of cognitive style since Witkin (Witkin, Karp, et al., 1959) first tested alcoholics. The scores on the GEFT of this non-random sample of 126 self-selected alcoholics did not indicate field dependence as significant which has been reported in other studies by Witkin et al (1959) and other researchers investigating the cognitive style of alcoholics.

Over the years of investigation of Witkin's (1959) construct of cognitive style researchers have concluded that brain damage might be responsible for field

dependence (Witkin, Dyke, et al., 1962) in alcoholics. This assertion alone could be considered as a negative connotation (indicating an ability and not style). There are no right or wrong learning styles (Sternberg, 1997). Brain-damaged subjects have been tested along with alcoholics and nonalcoholic (Goldstein, Neuringer, et al., 1970). No evidence was found to separate the three groups. The performance of alcoholics could not be distinguished from that of brain-damaged alcoholics or nonalcoholic (Ryan & Butters, 1983, p. 161).

The data seem to point toward the GEFT as an “ability” test for this group. There was a large amount of variance on the GEFT that did not appear on the other tests. The question is raised as to the importance of the abilities tested by the GEFT: abstraction and spatial abilities. If the ability to cognitively restructure abstractions is solely considered “intelligence,” the GEFT is a strong test for abstraction ability.

After more than 30 years of research of cognitive style and field dependence-independence, Witkin and Goodenough (1981) concluded:

While we believe it appropriate to describe field dependence-independence as a cognitive-style dimension, it is important to note that cognitive restructuring is defined as an ability dimension. All tests of restructuring, such as the EFT (Embedded Figures Test) require subjects to restructure problem materials if they are to earn high scores. A high score therefore reflects the subject’s ability to meet this requirement. The fact that cognitive restructuring is an ability dimension holds implications for its relationship with measures of intelligence. If there is a very general ability dimension (G), in factor-analytic terms, then some correlation between restructuring and other abilities may be expected. In fact, the evidence shows that disembedding ability is related to verbal comprehension ability, for example (p. 61).

However, the GEFT scores were not significantly different for the two sobriety groups when the subjects were separated into high, middle, and low scores and chi-square was used. There was a large variance in the scores on the GEFT, which brings about more questions as to the validity of the GEFT for assessing alcoholics. More research needs to be conducted as to the acceptability of using the GEFT as an indicator of cognitive style and specifically abstracting ability.

Eysenck (1979) maintains that intelligence has three major meanings in contemporary writings of research: biological intelligence, psychometric intelligence, and social intelligence. Goldman and Goldman (1988) found that alcoholics did as well as non-alcoholics on abstraction tests with remediation suggesting alcoholics can learn elements of psychometric intelligence. ANOVA results in this study did show that there was a significant difference in GEFT scores of the education groups (high school or less; some college; bachelor's and above). Independent t-tests pointed to a significance of .001 between high school or less and some college groups and not significant between some college and bachelor's and above. The GEFT scores were not significant when chi-square and the ethnicity groups (white-non-Hispanic and Other) and "high, middle, low" score categories were used, $\chi^2 = .541$. When the scores were examined using the independent t-test of the actual scores on the GEFT and ethnicity, there was a significant relationship at an Alpha level of less than .01.

Education and ethnicity could be a factor in the GEFT results and needs more investigation with more ethnic subjects than volunteered for this study. Can

training help promote effective cognitive restructuring and change alcoholics' scores on abstraction tests? When can the training begin for more effective outcomes during problem solving?

The GEFT scores resulted in findings in ethnicity, described as personality or context variables, in conflict with general alcoholism research stressing neurological damage. The significance of "what is measured" with the GEFT remains an issue in this research. Personality variables are often mentioned as being associated with the GEFT. As Sternberg (1994) has indicated, the confusion remains as to the GEFT being a test of learner "ability" or "style." This study could not find data in the GEFT scores to strongly support one or the other.

More studies with matched groups and nonalcoholic controls are needed to discover the effects of ethnicity and education (context variables) on field dependence (abstraction ability) at various stages of recovery from alcoholism.

RESEARCH QUESTION TWO

Does the length of sobriety affect the distribution of the vocabulary, abstraction, and IQ scores of alcoholics on the Shipley Institute of Living Scale (SILS)?

The Shipley Institute of Living Scale (SILS) (Shipley, 1940) has often been used to identify alcoholics who may have brain damage (Parsons, 1987; Yohman, Schaeffer, et al., 1988; Cynn, 1992; Beatty, Katzung, et al., 1993; Beatty, Hames, et al., 1996; Bates, 1997). This study found that there was a significant difference in scores of the two sobriety groups on the SILS. The 28

days or less group scored significantly lower than the 29 days or more group on the SILS (ANOVA; Vocabulary= $F(1, 124) = 5.832, p = .017$, Abstract= $F(1, 124) = 5.797, p \leq .018$, IQ Score= $F(1, 124) = 5.217, p = .024$).

The question is raised as to what learning strategies and instructional designs should be implemented at specific stages of being clean and sober that can build upon the natural inclination of alcoholics to improve cognition over time. Brain damage may not be the issue but more effective training in problem solving may be a better approach to designing instruction for psychoeducation.

The vocabulary T-scores means for the whole group were not significantly different from the suggested average vocabulary T-scores for the SILS (Zachary 1986). These results also show a significantly higher score for the whole sample on the SILS abstraction scores. This sample had a higher abstraction mean 54.01; $SD = 8.66, p = .000$) than suggested by Zackery (1986) as average (T-score of 45).

The significant difference in the SILS vocabulary scores for the two sobriety groups points up the importance of Sternberg's observations about the importance of vocabulary as a context variable (Sternberg, 1985, p. 219). Improvement in cognitive efficiency with long-term sobriety may be indicated by the lower vocabulary scores in the early sobriety group, which also had the lower abstraction scores. However, using the independent t-test the abstraction scores of both sobriety groups were not significantly different from the average abstraction score (T-score= 45) recommended by Zachary (1986) for the SILS (abstraction= 49.29; $SD = 10.52, p = .447$).

Issues in Curriculum and Instruction

The intention of this research was to place the Shipley Institute of Living Scale (SILS) T-scores in a sobriety framework with three ability or skill variables, vocabulary skills, abstraction ability, and IQ score, to evaluate cognitive efficiency and aid in identification of cognitive impairment (Zachary, 1986, p. 1). Another issue surfaced: the interaction effect of education and ethnicity on the scores on the SILS for the sample (two additional variables, along with sobriety, that need further examination).

Miller (1991) expressed the importance of the examination of certain essential issues related to substance abuse treatment outcomes in the areas of Neuropsychology, personality, and cognitive style when examining relapse. Each area has important implications for effective treatment strategies and instructional designs. Studies in Neuropsychology have been done (Gregson & Taylor, 1977) which report that “relative cognitive efficiency” (mainly memory and mental classification skills) was the best predictor of relative relapse. Those higher in this trait were found to have lower relapse rates.

Studies that conclude alcoholics are generally field dependent, lacking in abstraction skills, are questioned by the results of this study. More research is needed into the effect of improvements in cognitive efficiency (such as improved vocabulary skills) of alcoholics on their ability to stay clean and sober.

Sternberg theorized that, “development of verbal skills emphasizes learning from context” (1985, p. 219). People of different ability levels use

different information to construct definitions of words. Learning from context reflects important vocabulary-acquisition skills that are needed to acquire new information. Vocabulary could be considered one of the basic skills necessary for an alcoholic to acquire the information to stay clean and sober. The ethnicity and education groups of this sample did show a significant difference in vocabulary scores on the SILS. Also, those in early sobriety had lower SILS vocabulary scores.

Additional research is needed in the design for instruction of the “vocabulary of recovery.” Many strategies and techniques of staying clean and sober in recovery are embedded in the context and vocabulary of psychoeducational programs such as the Minnesota Model and the Therapeutic Community and literature such as “The Big Book of Alcoholics Anonymous” (Anonymous, 1976). Basically, if the alcoholic lacks an understanding of the vocabulary of recovery literature, he or she may not understand the concepts related to understanding the “context” of sobriety. Stronger vocabulary skills are indicated as a predictor of cognitive efficiency (Shipley, 1940; Sternberg, 1984; Zachary, 1986)

Cognitive efficiency and contextual learning studies have indicated a connection between alcoholics with an active religious belief, joining Alcoholics Anonymous (AA), and length of sobriety (Gregson and Taylor 1977). Those who did not join AA and had high cognitive efficiency had fewer relapses. This study reported 60% of the volunteers attended at least two AA meetings per week. Of the 126 subjects, 117 said they believed in a high power (the basis of the AA

spiritual program). According to Miller (1991) many subjects in addiction research who had lower cognitive efficiency and who did not join AA had the worst prognosis. He concluded that

high cognitive efficiency may mediate success in self-efforts at sobriety, but, lacking this trait, the external encouragement and affiliative control exerted by AA-type support groups may serve as an alternative means of staying sober (p. 278).

The demographic information in this research revealed 61% of the participants felt they were misunderstood in primary and secondary school. Of the total sample 49% said they caused some degree of problems in the classroom. Eighty-nine per cent (89%) of this group of alcoholics wanted to return to school for more education. Harder (1990) found that “cognitive competence” measured by high neuropsychological performance tends to be associated with successful recovery, in addition to intellectual level, capacity for close personal relationships, and social class.

Miller (1991) points to the possibility of “two clusters of substance abuse populations: 1) the intellectually competent who recover without exterior help, and 2) those who recover with exterior support and have lower intellectual competence. Each group may require markedly different forms of intervention (p. 281). Joseph (1982) located skills involved in planning and language which seemed to play a role in long-term sobriety. The Joseph (1982) study suggested that the inability to use inner speech (Vygotsky, 1986) and not neuropsychological impairment may be the cause of low intellectual levels in substance abusers.

More research is required in the area of curriculum and instruction focusing on different instructional methods and pedagogical paradigms to increase cognitive efficiency and promote social competence described by Harder (1990), Joseph (1982), and Miller (1991).

Other alternatives to the empirical-analytic science paradigm of curriculum research methods are described by Schubert (1986, p. 181) and could be considered. For example, the “hermeneutic science” paradigm examines the social organization and interactions among persons and their cultural and historical circumstances. One question for examination might be important for future research: what cognitive constructivist learning activities (Bruner 1958; Piaget 1959; Bandura 1977; Vygotsky 1978, 1986) could be designed during client learning sessions in the psychoeducational component of treatment programs to increase cognitive efficiency and positive skills of social interaction?

RESEARCH QUESTION THREE

Does the length of sobriety affect the distribution of scores of alcoholics on the Kolb Learning Styles Inventory (LSI)?

Kolb (1984) states that Carl Jung’s theory of psychological types is the basis for the LSI experiential learning theory (p. 78). Jung (1977) was holistic in his approach to psychological types, which explained his concepts of individual differences. Theories of internal and external orientation and the introvert and extrovert in human differentiation are the basis for the four basic learning

preferences described by Kolb (1984). Jung (1977) supported the belief that human individuality develops through social interaction and experience.

Jung also influenced one founder of Alcoholics Anonymous, Bill Wilson, who wrote to the famed psychologist in January of 1963:

Very many thoughtful AAs are students of your writings. Because of your conviction that man is something more than intellect, emotion, and two dollars worth of chemicals, you have especially endeared yourself to us.... You will also be interested that in addition to the “spiritual experience”, many AAs report a great variety of psychic phenomena, the cumulative weight of which is very considerable. Other members have—following their recovery in AA—been much helped by your practitioners. A few have been intrigued by the “I Ching” and your remarkable introduction to that work... Please be certain that your place in the affection, and in the history of the Fellowship, is like no other (Anonymous, 1984).

Wilson had a passion for learning. Wilson (Anonymous, 1984, p. 359) often spoke of Jung and learning. Wilson gave three major talks at the Second International Convention of Alcoholics Anonymous in 1955 entitled “How We Learned to Recover,” “How We Learned to Stay Together,” and “How We Learned to Serve” (p. 359). Miller (1991) found three main psychological factors in alcoholism research which AA addresses for alcoholics: shared beliefs, group cohesiveness, and mutual identification (p. 283). How an alcoholic constructs knowledge of recovery needs more investigation.

The theories and connections of Kolb’s Learning Styles Inventory and the program of Alcoholics Anonymous need to be explored more fully using the works of Carl Jung combined with sound instructional theory and design. AA is one of the most respected recovery programs in the world (Flores, 1988; Kahantzian & Mack, 1994; Caldwell & Cutter, 1998). The AA literature clearly

states that the organization was founded on the theories and principles introduced by respected pioneers of psychology like Carl Jung and William James (Anonymous, 1976).

In this study the Kolb LSI scores (CE, RO, AC, AE) were plotted on the “Cycle of Learning Graph” and connected (see Figure 4.5). A kite-like figure is formed which showed the dimensions of the learning preferences for the sample. The shape formed by the means falls to the right of center line of the graph or toward “reflective observation,” although the shape has slightly less volume toward “Active Experimentation.” No evidence was found that these dimensions were significant, and they could be considered almost equal in volume showing no concentration in any one sector of the graph. The top (concrete Experience) and bottom (abstract conceptualization) of the “kite,” show equal distances from the center. No significant volume of concentration was evident. In comparing the study by Kolb (2000) of 1,446 adults between the ages of 18 and 60 with this research very little difference in the “kite’s” shape is evident.

A scattergram of all the scores in this study did not show a significant regression line indicating a concentration of scores. When the means of the four scores were combined to find a dominant learning style for the group, the location was almost in the center of the four quadrants (see Figure 4.5). No significant learning style was found for the group using the means for the four scores.

The results of this study indicate that there is no dominant learning style for this group of alcoholics. These results could mean that the LSI has no biases toward this group of 126 alcoholics and has all the four types of learning styles

represented. In this study, traditional intelligence scores and personality variables seem to be independent.

Additional research is necessary using matched groups and the LSI. There is a suggestion in the data that alcoholics do not fall into one specific learning style category. More individualized instruction during psychoeducation may be necessary. Individualized instruction would indicate specific curriculum using the theories and practices of cognitive and constructivist theories (Vygotsky, 1978, 1986; Gardner, 1983; Kolb, 1984; Gagne, 1985; Dunn, Dunn, et al., 1989; Jonassen & Grabowski, 1993; Brown, Collins, et al., 1996)

RESEARCH QUESTION FOUR

Does the length of sobriety affect the correlation of scores of alcoholics in a negative or positive direction on the GEFT, SILS, and LSI?

Parsons (1987) makes a distinction between “impersonal” and “interpersonal” testing of alcoholics. Impersonal tests have content that is of a non-personal nature (e.g. vocabulary, abstracting/problem solving). Interpersonal refers to “real life behavior” testing (e.g. educational background, learning preferences).

The IQ score for the SILS (impersonal testing) was based on vocabulary and abstraction skills. Since the SILS and the GEFT scores were based on abstraction ability, it was expected that the SILS score and the GEFT scores would correlate. Correlations were in the positive direction with the whole sample on all scores. With the 28 days or less group, only the GEFT and the SILS

vocabulary scores did not correlate. There is an indication vocabulary and abstraction do not have a connection in early sobriety but further investigation of newly sober subjects might reveal more connections.

Only one of the four scores on the LSI did correlate with the SILS or the GEFT scores, abstract conceptualization. The scores of those who preferred the abstract learning style did correlate with the SILS and the GEFT scores. This study did not investigate how learning preferences affected test scores, which needs more investigation.

A significant learning preference for this sample of 126 alcoholics was not found. With no specific learning style indicated from the scores on the LSI an instructional designer would be challenged to suggest programs from an array of learning styles based on an alcoholic's personal and preferred method of knowledge acquisition.

Dynamic Assessment as Psychoeducational Pedagogy

The scores on the SILS and the GEFT did have significant correlations for the whole sample. Both tests require abstraction skills. A caution note should be given. When guidelines are developed pinpointing an alcoholic's knowledge and skills, impressions may be inaccurate as to the abilities and learning styles of alcoholics because of the effect of perception on the outcomes. Gardner (1983) explains that

Central to spatial intelligence is the capacities to perceive the world accurately, to perform transformations and modifications upon one's initial perceptions, and to be able to re-create aspects of one's experience,

even in the absence of relevant physical stimuli. One can be asked to produce forms or simply to manipulate those that have been provided. These abilities are clearly not identical: an individual may be acute, say, in perception, while having little ability to draw, imagine, or transform an absent world.

The effect of alcohol on initial perceptions and “the ability to gather, process, store, and respond intelligently to incoming information is obviously affected by alcohol ingestion” (Ryan & Butters, 1983). This study suggests that the individuality of learning preferences of alcoholics may be affected also, but no specific learning style is preferred by this sample. There was a mixture of learning preferences. More dynamic methods of assessment during recovery are recommended including static group testing to provide individualized attention to learners in psychoeducational learning environments (Saarnio, 1992). More research is needed to understand the effects of alcohol on the individual alcoholic’s acquisition of knowledge in context.

Alternative to static tests is dynamic assessment that was suggested by Nixon and Parsons (1991) who worked with a test model that used the Plant Task with alcoholics (not a ‘correct’ or ‘incorrect’ answer test). Lev Vygotsky (1978, 1986) refers to the zone of proximal development (ZPD) and dynamic assessment. This concept looks at the knowledge a learner cannot yet handle alone but can do with the help of more skilled associates. Campione (J. Campione, Brown, et al., 1984) discusses the width of the zone and how the ZPD varies across individuals and across domains of learning within an individual. One learner could have a “narrow” zone while another has a “broader” zone, suggesting higher performance skills. In contrast to static assessment procedures, which emphasize

previously acquired knowledge in terms of cores, dynamic testing involves purposeful teaching within the testing situation as was reported by researchers using alcoholic subjects (Nixon, Tivis, et al., 1992; Saarnio, 1992). Dynamic assessment attempts to distinguish between the apparent level of development as might be measured by a standardized test and the level of potential development. Evidence on the effectiveness of dynamic testing confirms that it has considerable value for predicting learning potential (Hayword & Txurie, 1992).

The use of dynamic testing could be a strategy for more internalization of problem solving, which is considered one of the most essential characteristics of cognitive development (Piaget, 1952; Bruner, 1966). Internalization takes a learner from one level of understanding of problem solving to higher order thinking skills (e.g. motor to imager to symbolic). Using the problem-solving process of dynamic assessment could provide the instruction and assessment an alcoholic needs to increase spatial skills.

Implications of Findings for Further Research

One of the major suggestions which surfaced in this research concerned the importance of the development of individualized curriculum and instruction in psychoeducation related to different learning styles of alcoholics. Although alcoholism research has emphasized the etiology of alcoholism, more emphasis is needed on designing the psychoeducational components of recovery. This study suggests that length of sobriety may be less of an issue than instructional design. There were significant differences between groups in learning skills and

preferences no matter the length of sobriety. The dynamic and varied nature of individual learning preferences could be a factor in recidivism. Alcoholics in this study had enough significant differences in a learning preference inventory to call attention to the possible need for individualized instruction and dynamic assessment throughout the recovery process.

The educational aspects of recovery need more review. Specific learning strategies for different learning preferences should be explored. Evidence in this study showed that length of sobriety does not necessarily indicate “alcoholic” learning preferences or imply a specific teaching strategy. Much quantitative work has been published concerning alcoholism; however, more qualitative research may be necessary to discover the deeper meanings and connections of length of sobriety to learning deficiencies and personal harm done to the alcoholic because of insufficiency in educational skills or cultural disadvantages.

Similarities in alcoholics learning preferences need more examination than differences even though those likenesses may be in smaller groups and less obvious. More research might indicate individualized instruction and dynamic assessment to be more successful than mass approaches using large group treatment plans. This research points toward a possible value of less emphasis on standardized treatment programs and more concentration on individualized educational treatment plans using strategies for different learning styles.

More concentrated research in constructing curriculum and instruction for recovery environments could look at issues like ethnicity and educational

background, as well as length of sobriety, which may provide more effective results for short and long term recovery plans.

Conclusion

Although not common when researchers investigate alcoholic subjects, this study emphasized educational theories and practices as important in the psychoeducational component of recovery from alcoholism. Attention was paid to the learning preferences of 126 self-reported alcoholics who were a non-random sample. No attempt was made to generalize the results, and ecological fallacies and generalization beyond the range of this study were tirelessly avoided.

Cognitive learning style was considered as a personality variable but this study suggests that the concept of field dependence measured by the Group Embedded Figures Test (GEFT) (Witkin, Oltman, et al., 1971) blurs the learning picture of the alcoholic. This alcoholic sample did not have a significant number of field dependent learners. More recent learning inventories such as the Kolb Learning Styles Inventory (Kolb, 1984) gave a more accurate picture of the alcoholic as an individual learner. Group data tended to suggest that Gardner's theories of multiple intelligences (Gardner 1983) would be more applicable when designing instruction for psychoeducational learning environments. The data presented identifying the cognitive learning styles of this group of alcoholics suggests that staying clean and sober may also depend on education and ethnicity context variables.

The Shipley Institute of Living Scale (SILS) would be called a static test and not dynamic assessment. Most alcoholic studies show an average to above average score on static intelligence tests as did this research. This study did not show intelligence as a unitary capacity, but the literature suggests that learning preferences and amount of sobriety may affect an alcoholic's cognitive efficiency and, consequently, performance on static tests. No specific learning style correlated with lengths of being clean and sober, an area which needs more research with matched subjects.

The severe deficits in abstract-reasoning ability were not shown to be significant in the tests and inventory used in this study. Subjects with no sobriety and long-term sobriety were not identified as having severe deficits. Even though some had low scores on the abstraction tests, the significant lower scores were not a major finding in this study. However, ethnicity and education did show interaction effects. Literature in alcoholism and educational research suggests abstraction skills can be changed with training.

Future research in alcoholism should investigate recovery environments using alternative methods of instruction with curriculum and instructional strategies for individualized instruction and assessment such as dynamic testing, which rely on Vygotskian theories and overall cognitive constructivist methods of instruction.

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After teaching in Indianapolis, Nick opened a successful real estate school and sold and managed property for over 25 years. With the desire for life long learning experiences he went back to college in 1994 to finish a Masters of Science degree in Curriculum and Instruction with a certificate in Instructional Technology at Texas A & M University- Corpus Christi, Texas. In 1995 he was admitted to the University of Texas at Austin to complete a Ph.D. in Curriculum and Instruction with a specialization in Instructional Technology. Currently, he is an Assistant Professor of Instructional Technology at the University of the Incarnate Word in San Antonio, Texas and lives in Austin.

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