RELATIONSHIPS AMONG BEHAVIOR-PERSONALITY VARIABLES, PREFERRED LEARNING STRATEGIES, AND LEARNER CHARACTERISTICS IN THE WORKPLACE

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1. Remember where you came from, it made you who you are today.
2. It's not "WHAT" we have in our lives, it's "WHO" we have in our lives.
3. Eventually, all of the pieces fall into place...until then, laugh at the confusion, live for the moment, and know that everything happens for a reason and in accordance to God's plan.
4. Now faith is the substance of things hoped for, the evidence of things not seen. Hebrews 11-1

This is dedicated to my three girls. You are the lights of my life and my sole reason for being. Thank you for your love, and companionship, it means everything to me. I love you all and I am looking forward to being with you again in Heaven.

Whitney Smax 02/18/93 - 10/23/06
Keelee Jo 05/28/93 - 11/14/07
Mogie Lee 03/07/96 - 10/07/08

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CHAPTER 1

INTRODUCTION

Background

The business world is one that is constantly changing and this change can be a bothersome event. Borders no longer restrict or confine businesses, industries, or people. As societies become more global, so does the need for each individual in the workforce to become more effective. Individuals in the workforce are told to adapt and change or face becoming obsolete (Grantham, Ware, & Williamson, 2007) and in some cases, organizations have all but relinquished their responsibility for workforce development and placed the responsibility back on the shoulders of each individual in the workforce (p. 92).

As a whole, industrial and corporate organizations are faced with two defining challenges and changes: attraction and retention of associates. Current research on the needs and characteristics of various age groups has suggested that different groups may have characteristics and needs that may impact successful workplace recruitment and retention. In this study, a method was needed to identify age groups for analysis. An approach currently used in the literature and in classifying age data in reporting U.S. workplace date is the use of the "generations" concept popularized by Strauss and Howe in extensive studies of different age groups as learners and workers. Using the

generations concept and classifications, Grantham et al. (2007) estimated that currently over 17 percent of the U.S. workforce is comprised of the Traditionalists generation, identified by Strauss and Howe (1991) as people born between 1925 and 1942, and Baby Boomers, who Strauss and Howe (1991) labeled people born between 1943 and 1960. Austin (2005) asserted that many of these individuals are deciding that it is time to leave the workforce. As these individuals are resigning, their vacated positions are being filled by those from Strauss and Howe's (1991) Generation X, people born between 1961 and 1981 and those from their Millennial generation, people born between 1982 and 2003. Because the Strauss and Howe generations are commonly acknowledged age groups in the literature and have at least some research-based foundation and rationale and because U.S. workforce data can be obtained by these groups this study used these age categories for grouping ages for data analysis.

This cycle of individuals rotating in and out of the workforce is nothing new. However, what is concerning is the amount of knowledge that the traditionalist and baby boomer generations possess and are taking with them when they leave (Austin, 2005; Grantham et al., 2007; Salopek, 2005), and the vacancy of knowledge this is creating for the industrial and corporate organizations that remain in operation. In addition to those who are preparing to retire from the workforce, Grantham, Ware, and Williamson (2007) asserted there is another segment of the population known as *migrating workers* who are also creating knowledge voids in the workplace. Their research found that approximately 40% of this migrating population has indicated they are interested in seeking new job opportunities within the coming year (2007, p. 98).

While retiring and migrating workers do create some substantial obstacles for organizations to overcome, they also present substantial issues that are directly related to the hiring, and training and development of personnel. With all of the individuals planning on retiring from the workforce, associate migration, and organizational expansion, corporate hiring personnel are scrambling to employ or promote individuals who possess the desired skill sets, who "fit" in the organization or within a specific level of the organization, and who possess a required level of growth potential.

At first this may appear to require an insurmountable amount of information to be collected from a would-be associate or an existing associate looking to be promoted. However, hiring personnel have many different types of instruments available to them that can extract appropriate information about associates relatively quickly. Four of the most commonly used instruments include: (1) *Hogan Personality Assessments*, which have been administered to over two million job applicants (Hogan, Hogan, & Warrenfeltz, 2007); (2) *Keirsey Temperament and Character Sorter*, which has been administered, on-line, to over seven million people (Keirsey, 2007); (3) *Myers-Briggs Type Indicator*, which, according to the Center for Applications of Psychology, is administered to approximately two million people annually (Carroll, 2003); and (4) *DiSC Personal Profile System 2800 Series*, which have benefited more than 50 million people (Geier Learning International, 2003).

In contrast to these behavior and personality instruments which corporate hiring personnel have frequently used to expedite the hiring and promoting process, training and development personnel (instructors) have not typically used any instruments that specifically assess an individual's preferred learning strategy. Given an absence of

appropriate assessment data, an instructor has three options available in order to evaluate how an individual prefers to learn. The first option is to utilize the results from one of the human behavior and personality instruments used for extending a job offer and assume that an individual's preferred learning strategy and behavior and personality traits are closely related. The second option is to observe how an individual goes about learning while in the classroom. The last option available to an instructor is to ask each individual how they prefer to learn a new task or information. While no assessment of behavior, personality, or learning preference is perfect, it seems likely that the combination of two specific assessments – one that assesses human behavior or personality, and one that assesses learning strategies – could very well provide a powerful compilation of data that could be used by an instructor to ensure that the needs of each learner are met; thereby establishing a more effective individual workforce. This supposition of the positive potential of assessment tools to help understand self and others is the core principle of instrumented learning theory, which formed a guiding impetus for this study.

Theoretical Framework

The proposed theoretical framework for this study was based on three theoretical/conceptual constructs (see Figure 1). There were: (a) Needs-Based Theory, (b) Adult Learning Theory, and (c) Instrumented Learning. Both needs-based theory and adult learning theory are composed of several foundational theories that focus on an individual's internal needs. These two theoretical strands were combined in this study with instrumented learning as a way to conceptualize the internally-driven needs of individuals in the workplace and to address these needs effectively to improve workforce

effectiveness. The combination of these theoretical and conceptual threads into a framework for this study is shown in Figure 1.

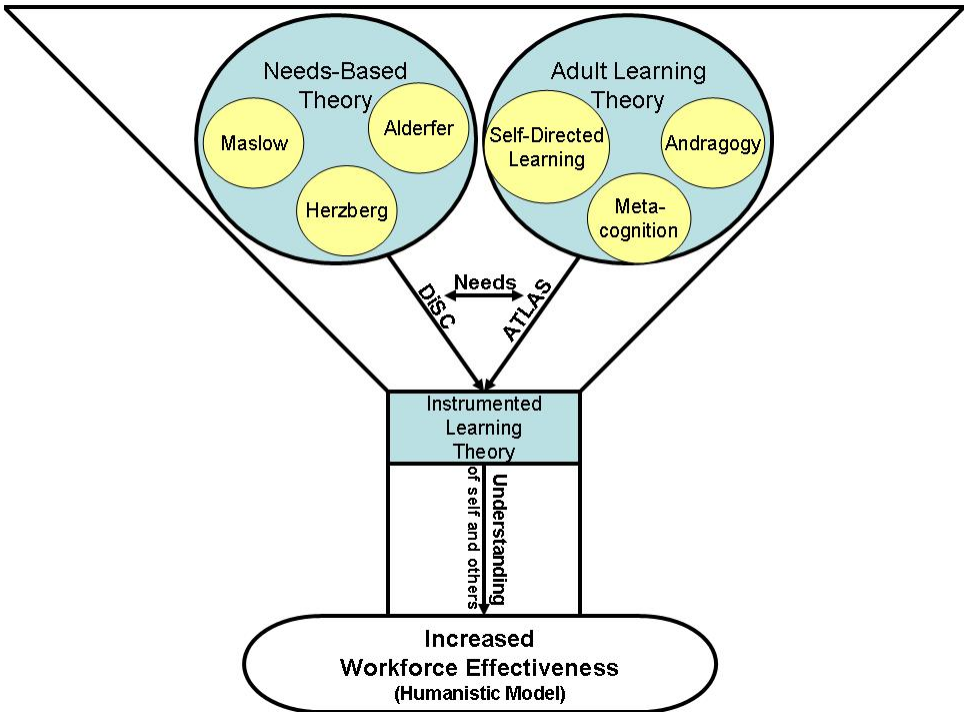

Figure 1. Proposed theoretical framework for this study: An approach to increased workforce effectiveness through meeting of individual needs

The first theoretical strand for this study, needs-based theory, was viewed as incorporating several foundational theories. Since this study addressed the issue of individual workforce effectiveness, Maslow's Hierarchy of Needs, Alderfer's ERG theory, and Herzberg's Motivation and Hygiene theories served as the underpinnings. It should be noted that this study addressed *individual* workforce effectiveness rather than work culture or organizational climate. Thus, theoretical consideration related to the needs of *individuals* was appropriate.

Needs-based theory addresses the fact that every individual has internal needs that must be fulfilled in order to allow a feeling of satisfaction. Maslow's (1987) hierarchy of needs proposes that there are five levels of individual needs: physiological, safety,

membership, esteem, and self-actualization. Alderfer's ERG theory, which is a revised model based on Maslow, comprised three levels of needs: existence, relatedness, and growth (Alderfer, 1972). This theory agrees with Maslow's in that they both concur that as internal needs on one level are satisfied, the internal needs for satisfaction on a higher level are increased (Lawler III, 1994). However, Alderfer's theory contends that if higher order needs are not met, then an individual can regress to lower level needs. It also contends that it is possible for all internal needs to be met at the same time; prepotency is not considered a factor (Lawler III, 1994).

The last fundamental theory used in this area was Herzberg's motivation and hygiene theory. This theory specifically addresses levels four and five of Maslow's hierarchy of needs: esteem and self-actualization. Herzberg proposed that there are two primary reasons for an individual's work performance: (1) job enrichment factors, which are referred to as Motivational factors, and (2) demotivational factors, which are referred to as Hygiene factors (Halepota, 2005; Hertzberg, 1967; Hertzberg, Mausner, & Snyderman, 2007).

Taken collectively, the needs-based theories of Maslow, Alderfer, and Hertzberg form one critical theoretical foundation for this study. One working hypothesis for the study was that individuals in the workplace have personal needs and that understanding and meeting of these personal needs can improve individual performance in the workplace and thus can impact the overall effectiveness of the workplace. A second working hypothesis was that personal needs drive individual behavior, and that observed behavior or "personality" is a manifestation of needs. This has been conceptualized by some researchers as the "iceberg theory" view of behavior/personality, which views

observable human behavior/personality as the visible "tip" of a large internal structure that is underpinned and supported by personal characteristics such as experiences, beliefs, and needs (Wilderdom, 2003).

A second theoretical foundation for this study was adult learning theory. Like the needs-based theory thread, adult learning theory was also built upon three base theories. The first was John Flavell's (1976) theory of metacognition. This theory addresses how an individual comes to know information, how this information is applied in various contexts, and how individuals utilizes this knowledge to understand their own cognitive processes as well as those of others. Thus, metacognition could be viewed as an understanding or "knowing how one knows."

The adult learning model of andragogy and self-directed learning developed by Knowles (1980) provided the second and third components of the adult learning theory foundation for this study. According to Knowles, andragogy refers to "the art and science of helping adults learn (1980, p. 43) and contains five assumptions that are essential for industrial and corporate instructors to understand if learners are going to be successful in the classroom and on the job.

Self-directed learning means that each individual is responsible for his/her own learning. Davis (2006) identified self-directed attributes as "developing goals for learning, controlling the learning task, determining learning methodology, monitoring and evaluating progress toward goals, and determining the value of learning tasks in relation to personal and professional skills and knowledge" (p. 11.3). What is common among these descriptors is the necessity for self-directed adult learners to act, not re-act;

to control the learning process, not be controlled by the process; and to actively seek knowledge, not to be fed information.

Applying the three threads of adult learning theory discussed here to this study led to a working hypothesis that adult learners have basic learning needs and that meeting these needs assists them in gaining awareness or metacognition of their own learning processes and helps them become more skilled at self-direction. This, in turn, suggested that since needs related to metacognition and learning reside alongside other types of needs identified by Maslow, Alderfer, and Hertzberg within each individual, it was possible that some association might exist between a person's learning needs and other needs that drove their observed behavior/personality. Thus, relationships might be observed between measures of learning needs and measures of needs-driven behavior/personality.

These hypothesized relationships among *measures* of needs in individuals set in place the third theoretical component for this study, which has been referred to in the literature as *instrumented learning.* Instrumented learning is concerned with ways to assess and understand oneself and others; it's basically a way to facilitate metacognition. Instrumented learning refers to the process of using simple assessment tools to facilitate learning through self-knowledge. This concept was pioneered by Blake and Moulton, 1972a, 1972b), specifically for use in workplaces to promote knowledge of self and others for the purpose of improving a company's productivity. This workplace origin of instrumented learning made it particularly appropriate for this study, which was situated in the corporate environment.

Two specific instrumented learning tools were selected for this study: the *DiSC Classic Personal Profile System 2800 Series,* and the ATLAS (***A****ssessing* ***T****he* ***L****earning Strategies of* ***A****dult****S***). These two instruments were selected because of the theories on which they were based: both deal with needs-driven behaviors. Needs theories were the developmental and psychological underpinnings for the DiSC, which classifies individuals into one of four groups based on their internal needs and the behaviors/personalities created by these needs. The four DiSC dimensions of needs-driven behavior/personality are Dominance, Influence, Steadiness, and Conscientiousness (Corexcel, 2003). Corexcel (2003) described individuals in the four DiSC groups:

(a) Dominance group: represents the need for control, and emphasizes shaping the environment by overcoming opposition to accomplish results'

(b) Influence group: represents the need to be liked, and emphasizes shaping the environment by influencing or persuading others

(c) Steadiness group: represents the need for stability, and emphasizes cooperating with others within existing circumstances to carry out a task

(d) Conscientiousness group: represents the need to be correct, and emphasizes working conscientiously within existing circumstances to ensure quality and accuracy.

Adult learning theory and its components of metacognition, self-direction, and andragogy were the underpinnings for the ATLAS, which classifies individuals into three groups based on individual preferred learning needs. Conti and Kolody, (1998, 1999b) described the three ATLAS learning strategy groups:

(a) Navigators: focused learners who plan a course for learning and work their plan

(b) Problem Solvers: learners who depend heavily on all the strategies in the area of critical thinking

(c) Engagers: passionate learners who love to learn, learn with feeling from the affective domain, and learn best when actively engaged in a way they find meaningful.

The use of these two assessments as instrumented learning tools was hypothesized in this study to lead to observed patterns of relationship among the various types of internal needs of individuals in the workplace. It was theorized that such knowledge of self and others could be used to increase the workplace effectiveness of each individual, to guide appropriate training to meet individual needs, and to thus positively impact a company's bottom line.

Problem Statement

Current literature (Carroll, 2003; Geier Learning International, 2003; Hogan et al., 2007; Keirsey, 2007) suggests that assessing an individual's behavior and personality profile is a necessary step for determining whether or not one may be best suited for a particular job within an organization. However, understanding how an individual prefers to learn new material also needs to be taken into consideration and utilized in conjunction with each individual's behavioral profile if training instructors and organization leaders want to ensure that newly hired or promoted associates are in fact learning the necessary skills to perform on the job.

Hiring personnel in industrial and corporate organizations in the United States are currently utilizing instruments such as *DiSC Personal Profile System 2800 Series, Hogan Personality Assessments, Myers-Briggs Type Indicator, Keirsey Temperament and Character Sorter* that assess an individual's behaviors to: (a) determine whether or not to extend a job offer for new employment, or (b) determine whether or not to extend an offer of promotion to an existing associate. However, lack of evidence in the current literature suggests that industrial and corporate hiring and training professionals are not utilizing any tools that specifically assess an individual's learning strategy.

The problem with current organization practices is that hiring and training personnel are currently only addressing one of the learner's two major categories of needs, i.e. behavioral needs addressed within traditional needs-based theory; needs of the second category, adult learning theory, are not being assessed to determine the learner's preferred learning strategy. Since these learning instruments assess different types of internal needs, by failing to determine both the learner's behavioral and learning needs, hiring and training professionals may be overlooking a very important combination of tools that could be valuable in assisting them in instructing and developing the whole associate, ultimately increasing individual workforce effectiveness.

Purpose of the Study

The purpose of this study was to describe the behavior/personality and learning strategy profile and relationships as they related to individuals in the corporate workforce. The insights obtained from combining and interrelating these two concepts may help maximize individuals' over-all level of job knowledge, productivity, retention,

and ultimately individual workforce effectiveness through the meeting of their needs in both the behavioral and learning domains.

The concept of needs-driven behavior or personality was measured with the *DiSC Personal Profiles System 2800 Series*, also known as the DiSC Classic. The concept of preferred learning strategy was measured with ATLAS. In addition, data were collected on the demographic variables of management level and industry.

Research Questions

1. What is the DiSC Classic profile of industrial and corporate associates?
2. What is the ATLAS profile of industrial and corporate associates?
3. What relationships exist between the DiSC Classic measures and the demographic variables?
4. What relationships exist between the ATLAS measures and the demographic variables?
5. What relationships exist between the DiSC Classic measures and the ATLAS measures?
6. What naturally occurring clusters exist among the DiSC classic measures in industrial and corporate associates?

Table 1 presents the study's research questions, variables, data sources, and statistical analysis.

Table 1. Research Questions, Variables, Data Sources and Analysis

Research Question	Variable	Data Source	Statistical Analysis
1	Behavior/ Personality profile	Questionnaire – Section 1 (DiSC data)	Descriptive Statistics
2	Learning strategy	Questionnaire – Section 2 (ATLAS data)	Descriptive Statistics
3	Relationships: DiSC and Demographics	Questionnaire – Sections 1 & 3	Descriptive Statistics and Crosstabs
4	Relationships: ATLAS and Demographics	Questionnaire – Sections 2 & 3	Descriptive Statistics and Crosstabs
5	Relationships: DiSC and ATLAS	Questionnaire – Sections 1 & 2	Chi-Square and Crosstabs
6	Clusters within subjects	Questionnaire – Sections 1 & 2	Cluster Analysis, Discriminate Analysis, and Chi Square

Definition of Key Terms

Conceptual Definitions

Adult Learning Theory: Andragogy is defined as "the art and science of helping adults learn" (Knowles, 1980, p. 43). Self-directed learning refers to an individual's ability to chart and maintain a course of independent learning (Merriam & Caffarella, 1999). Metacognition is defined as "one's knowledge concerning one's own cognitive processes and products (Favell, 1976, p. 232). These three constructs served as the foundation for what this study defined as Adult Learning Theory.

Iceberg Theory: There is no specific model for this generally accepted theory. However, Freud's topographical theory provides the best description. Freud's Iceberg model stated that only 10% of an iceberg is visible while the remaining 90% is submerged and therefore unobservable (Wilderdom, 2003). This study

used the Iceberg theory to describe the 10% of individual behavior which is observable and the 90% of needs which are unobservable.

Individual Workforce Effectiveness: The current review of literature (Brimm & Murdock, 1998; Gillette, 2007; Kwek, 2007; Nagayama, 2006; Parry & Lacy, 2000; Raphael & Stoll, 2006; Vance & Ensher, 2002) only referred to actual associate or employee productivity in terms of output or other contributions to the organizations financial bottom-line. This study defined individual workforce effectiveness, from a more humanistic view, as the increased potential of each individual to be promoted internally, advance to new positions in other organizations, to achieve higher personal and social awareness and understanding, as well as to create an increased positive impact on the organizations financial bottom-line.

Instrumented Learning: Instrumented learning refers to the process by which an instructor utilizes various analytical tools to facilitate learning and do more than to provide a successful a learning experience (Blake & Moulton, 1972a, 1972b). This study used the DiSC and ATLAS learning instruments as examples of tools which can: (a) provide instructors with valuable information regarding learner performance, (b) provide instructors with the means to objectively, not subjectively, assess learner performance, and (c) provide a means for longitudinal assessment (Blake & Moulton, 1972a, 1972c).

Needs-Based Theory: Theories in this conceptual cluster address the nature and effects of human needs. Maslow's hierarchy of needs theory states that an individual's needs are the main motivator in human behavior and that basic needs

must be fulfilled before an individual can progress to more advanced needs (Deming, 2007; Maslow, 1987). Alderfer's ERG theory (Alderfer, 1972; Lawler III, 1994) states that there are essentially three core needs: (a) Existence, (b) Relatedness, and (c) Growth. Hertzberg's motivation and hygiene theory (Halepota, 2005; Hertzberg, 1967) states that there are two factors that cause motivation or demotivation. Both Alderfer's and Hertzberg's theories used Maslow's theory as the foundation for their studies. This study used the tenants of these three theories as the underpinnings to describe how individuals have needs that must be addressed in order for them to advance or progress both in the workforce.

Operational Definitions

Baby Boomer: Individual born between 1943 and 1960.

Behavior/Personality Profile: This study used the Inscape Publishing (1996a, 1996b, 2001) *DiSC Personal Profile System 2800 Series*, which was based on the original work of William Marston's (1928) two-axis, four dimensional model of behavior to identify an individual's behavior/personality profile.

Behavior Style: DiSC was used as the learning instrument to identify individual behavior style. DiSC identifies a learner's behavioral style as Dominance, Influencer, Steadiness, or Conscientiousness. Individuals in the Dominance category are described as self-reliant, calculated risk-takers, self-critical, unassuming, self-effacing, realistic and tend to weigh the pros and cons before making a decision (Corexcel, 2003). Individuals in the Influencer category are described as emotional, self-promoting, trusting, influential, pleasant, sociable,

and generous (Corexcel, 2003). Individuals in the Steadiness category are described as outgoing, alert, eager, critical, discontented, fidgety, and impetuous (Corexcel, 2003). Individuals in the Conscientiousness category are described as restrained, analytical, sensitive, mature, evasive, holding exceptionally high standards, and being their "own person" (Corexcel, 2003).

Demographic Variables: The demographic variables for this study were defined as: (1) age, (2) gender, (3) management level, (4) ethnicity, (5) highest level of education completed, and (6) industry.

Generation X: Individual born between 1961 and 1981.

Learning Strategy: ATLAS was used as the learning instrument to determine individual learning strategy. ATLAS identifies a learner's learning strategy as Navigator, Problem Solver or Engager. Navigators are focused learners who chart a course for learning and follow it and are focused on the learning process that is external to them by relying heavily on planning and monitoring the learning task, on identifying resources, and on the critical use of resources (Conti, in press). Problem Solvers are learners who rely heavily on all the strategies in the area of critical thinking and who like to test assumptions, generate alternatives, practice conditional acceptance, adjust their learning process, use many external aids, and identify many alternative resources (Conti, in press). Engagers are passionate learners who love to learn and learn best when they are actively engaged with the learning task, and involve themselves in the reflective process of

determining internally that they will enjoy the learning task before beginning such a task (Conti, in press).

Millennial: Individual born between 1982 and 2003.

Traditionalist: Individual born between 1925 and 1960.

Methodology

Research Approach

This study was descriptive in nature and used a self-report questionnaire methodology. Descriptive research determines and describes the way things exist (Fraenkel & Wallen, 2003; Gay & Airasian, 2000). In educational research, the most commonly used descriptive methodology is the questionnaire (Fraenkel & Wallen, 2003) in which studies are designed to gather information about the abilities, preferences, behaviors, practices, concerns or interests of a particular group of individuals (Gay & Airasian, 2000). In this type of study it is common for the researcher to collect data from surveys or questionnaires that are self-administered by the participants (Gay & Airasian, 2000). This study used data from participants who completed the DiSC behavior style assessment and the ATLAS preferred learning strategy assessment.

Quantitative data were collected from the *DiSC Classic Personal Profile System 2800 Series* instrument (DiSC) and the ***A**ssessing **T**he **L**earning Strategies of **A**dult**S*** (ATLAS) instrument. These data, along with a set of demographic variables, were used to describe the behavior/personality profiles and the learning strategy preferences of the sample.

Sample and Population

A population "is the group of interest to the researcher, the group to whom the researcher would like to generalize the results of the study" (Fraenkel & Wallen, 2003, p. 97). The population for this study consisted of individuals working in financial, information, and manufacturing organizations in Oklahoma City, Oklahoma; no preference was given to the management, or non-management, level associates.

A sample refers to a subset of the desired population from which information is collected (Fraenkel & Wallen, 2003; Gay & Airasian, 2000). The sample for this study consisted of 124 individuals from the three organizational areas of finance (represented by American-Fidelity Assurance Group), information (represented by Cox Communication), and manufacturing (represented by Great Plains Coca-Cola). "The 'goodness' of the sample determines the meaningfulness and generalizability of the results… a good sample is one that is representative of the population from which it was selected" (Gay & Airasian, 2000, p. 123). In descriptive research the technique of cluster sampling is commonly used to congregate a sample that is representative of the targeted population which, in some cases, may be very large or very geographically disbursed (2000, p. 129). This approach is also more time- and cost-effective and is generally more convenient for the researcher (p. 129). This was the situation in this study. The researcher gathered information from individuals at three Oklahoma City businesses. These businesses were selected because: (a) the researcher had connections within each organization, (b) the researcher obtained consent from each organization to participate in the study, (c) the organizations represented a mix of organizations, (d) the organizations represented large sectors of Oklahoma City and Oklahoma industry, and (e) the researcher has a working knowledge

of each industry; he has worked in the financial industry for 13 years, he worked for Cox Communications Inc. for 3 years, and he currently works for Great Plains Coca-Cola Bottling Company.

The researcher also attempted to obtain consent from two public and one private oil and gas companies because of this industry's prominence in Oklahoma. However, none were willing to participate in the study. Based on the criteria used to gather the participating organizations, this study utilized convenience cluster sampling where cluster represented industry sectors. During May 2008, the researcher met with the three organizations that participated in the study and collected information regarding their associates' demographics and their DiSC and ATLAS profiles.

Instrumentation

A questionnaire was selected as the preferred type of data collection tool for this study because of the need to reach a large quantity of participants at multiple locations in a timely manner and at a minimum expense for the volume of data to be collected. The questionnaire consisted of three sections: (1) DiSC, (2) ATLAS, and (3) demographic information. Section 1 was a replica of the DiSC instrument. Section 2 was a replica of the paper-based ATLAS instrument. Both DiSC and ATLAS were described on pages 8 and 9. Section 3 consisted of six demographic questions pertaining to: (a) age, (b) gender, (c) ethnicity, (d) highest level of education, (e) management level, and (f) industry. The responses to the questionnaire provided individual scores that were utilized for descriptive data analysis, including cross-tabulations, one-way and two-way chi-squares, as well as cluster and discriminant analysis.

Procedures

Data collection for this study occurred in May 2008. All data were collected by the principle researcher. The researcher attended regularly scheduled meetings or training sessions at each organization and administered the questionnaire to all in attendance. Once all of the data were collected, the researcher coded and keyed the data into Excel and then imported the data file into SPSS for statistical analysis.

Data Analysis

Five types of analysis were run on the data. First, descriptive statistics were used to create a group profile of the participants in relation to the demographic data, behavioral styles, and learning strategy preferences. Second, one-way chi-square tests were used to compare the learning strategy preferences distribution of the participants to the norms of ATLAS. Third, two-way chi-square tests were used to examine relationships between behavior styles and learning strategy preferences of the participants. Last, cluster and discriminant analysis techniques were used to identify naturally occurring groups among the participants in the sample and to then describe the process that separated these groups.

Limitations of the Study

The following limitations were inherent in this study:

1. This study used a convenience cluster sample. Participation was limited to the three organizations and departments within each organization from which the researcher was able to acquire written consent. Because this was not a simple random sample of Oklahoma industries and companies, this limits the

generalizability of the study; the results cannot be generalized beyond the organizations in this study.

2. Participation was voluntary, which further imposed limits in size and representativesness of sample.
3. Self-reporting was a limitation because participants may have potentially misunderstand the instructions, one or more questions, or may have deliberately falsified information.
4. Participants may have had preconceived thoughts about participating in a research study.

Assumptions of the Study

The following assumptions were made regarding the participants of the study:

1. Participants understood the directions and answered the DiSC and ATLAS questions honestly and according to those instructions.
2. Participants accurately recorded responses on the questionnaire sheet.

Significance of the Study

This research has the potential to benefit corporate hiring professionals, training professionals, managers, and individual associates by helping them understand how training and other communications need to be developed and delivered to ensure each individual learner is instructed in a way that maximizes knowledge, efficiency, and productivity. Therefore, this study's significance lies in the findings, conclusions, and recommendations of the research that will help improve the preparation, productivity, and effectiveness of individuals in the Oklahoma workforce.

CHAPTER 2

REVIEW OF LITERATURE

The American Workforce

The United States Department of Labor and the United States Census Bureau collect and publish information on nearly 500 jobs divided among ten different industries. The ten broad titles for these industries are: Construction, Education and Health Services, Financial, Information (includes, radio, print and television media), Leisure and Hospitality, Manufacturing, Natural Resources and Mining, Other Services (except Public Administration), Professional and Business Services, and Trade, Transportation and Utilities (United States Department of Labor, n.d.). The information available from these two government agencies was gathered from various national and state surveys, and programs and the data shown were based on the North American Industry Classification System. The data reported here created a descriptive background of the national and local workforce in which this study was situated.

Due to the fact that the Industry at a Glance (IAG) information reported by the United States Department of Labor is refreshed every time a source program releases new statistics, the IAG information is not always reported consistently in the same type of tables or levels; and since the data are compiled from various agencies and surveys, the IAG information is not always directly comparable (United States Department of Labor, n.d.). Due to differences in survey methodology, some data may cover all workers or

establishments while other data may be for only a specific population. Clarifications necessary to describe the data were disclosed in the descriptions of each table in this literature review.

Industries

The information in this section was consolidated from the ten broad industries. Because this study focused on the Financial, Information and Manufacturing industries detailed data are reported here for these industries. Information on the remaining seven industries was consolidated and captured under the category of Other Industries. Table 2 reports the number of U.S. workers by age working in the Financial, Information and Manufacturing industries in the State of Oklahoma and within Oklahoma County for 2006. This table indicates that in 2006 approximately 66% of the Oklahoma workforce was between the ages of 25 and 54, 15% of the workforce was comprised of those 55 or older, and 19% of the workforce was between the ages of 16 and 25.

Table 2. Age Data for Oklahoma and Oklahoma County by Industries

	2006								
		Age							
	Total	16-19		20-24		25-54		55+	
	(,000)	(,000)	%	(,000)	%	(,000)	%	(,000)	%
State									
Total	1,181	135	11.4%	91	7.7%	774	65.5%	180	15.2%
Financial	59	3	5.1%	4	6.8%	40	67.8%	11	18.6%
Information	29	2	6.9%	2	6.9%	21	72.4%	3	10.3%
Manufacturing	144	7	4.9%	8	5.6%	106	73.6%	23	16.0%
Other Industries	949	123	13.0%	77	8.1%	607	64.0%	143	15.1%
County									
Total	335	34	10.1%	26	7.8%	224	66.9%	50	14.9%
Financial	19	1	5.3%	1	5.3%	14	73.7%	3	15.8%
Information	12	1	8.3%	1	8.3%	10	83.3%	1	8.3%
Manufacturing	24	1	4.2%	1	4.2%	18	75.0%	4	16.7%
Other Industries	280	31	11.1%	23	8.2%	182	65.0%	42	15.0%

Note. This table references private industry information for the State of Oklahoma and Oklahoma County for industry by age. Source: (United States Census Bureau, n.d.). Note: this level of information was not available from the United States Department of Labor for the national level.

Table 3 reflects the number of U.S. workers by ethnicity working in the Financial, Information and Manufacturing industries in the United States in 2006. The table indicates that the 2006 U.S. workforce was comprised of 82% Caucasian, 11% African-American, 4.7% Asian, and 2.3% Hispanic. These percentages remain consistent through each of the individual industries identified as well as the cluster grouping of Other Industries.

Table 3. Ethnic Composition of U.S. National Workforce

	2006								
		Ethnicity							
	Total	African-		Asian		Caucasian		Hispanic	
	(,000)	(,000)	%	(,000)	%	(,000)	%	(,000)	%
National									
Total	146,046	16,052	11.0%	6,838	4.7%	119,793	82.0%	3,363	2.3%
Financial	10,488	1,062	10.1%	562	5.4%	8,680	82.8%	184	1.8%
Information	3,566	424	11.9%	179	5.0%	2,899	81.3%	64	1.8%
Manufacturing	16,302	1,575	9.7%	853	5.2%	13,567	83.2%	307	1.9%
Other Industries	115,690	12,991	11.2%	5,244	4.5%	94,647	81.8%	2,808	2.4%

Note. This table references private industry information for industry by ethnicity, not the entire civilian workforce. Source: (United States Department of Labor, n.d.). Note: this level of information was not available from the United States Census Bureau; therefore no state or county information could be reported for Oklahoma.

Table 4 reflects the number of U.S. workers by gender working in the Financial, Information, and Manufacturing industries in the United States, State of Oklahoma, and Oklahoma County in 2006. The table indicates that the 2006 U.S. workforce was comprised of 46.4% female and 53.6% male. The state of Oklahoma and Oklahoma County also reported approximately the same percentage of difference. There were, however, differences in industry by gender as each of the specific industries were examined. Most noticeably, females were more heavily represented in the Financial industry, while males were more heavily represented in the Information and Manufacturing industries. The largest difference at all three levels of reporting was the

Manufacturing industry; while the smallest noticeable difference was in Finance at the national level and Information at the state and county levels.

Table 4. Gender Distribution of Workforce in U.S., Oklahoma, and Oklahoma County

	2,006				
		Gender			
	Total	Female		Male	
	(,000)	(,000)	%	(,000)	%
National					
Total	146,046	67,791	46.4%	78,252	53.6%
Financial	10,488	5,807	55.4%	4,681	44.6%
Information	3,566	1,501	42.1%	2,065	57.9%
Manufacturing	16,302	4,885	30.0%	11,416	70.0%
Other Industries	115,690	55,598	48.1%	60,090	51.9%
State					
Total	1,181	555	47.0%	626	53.0%
Financial	59	40	67.8%	19	32.2%
Information	29	13	44.8%	16	55.2%
Manufacturing	144	36	25.0%	108	75.0%
Other Industries	949	466	49.1%	483	50.9%
County					
Total	335	159	47.5%	176	52.5%
Financial	19	12	63.2%	7	36.8%
Information	12	5	41.7%	7	58.3%
Manufacturing	24	7	29.2%	17	70.8%
Other Industries	280	135	48.2%	145	51.8%

Note. This table references private industry information for industry by gender, not the entire civilian workforce. Source: (United States Census Bureau, n.d.; United States Department of Labor, n.d.).

Age

Table 5 reports for 2006 the number of employed and unemployed U.S. workers by age. In total for 2006, 95% of the private industry workforce was employed with this same high level of employment holding consistent for the 25 to 34, 55 to 64, and 65 and older age groups. Only the 16 to 24 age group had an employment percentage not in the

high 90%. This age range reported that 89% were employed while 11% were unemployed.

Table 5. Age by Employment Data for United States

2006					
	Total	Employed		Unemployed	
Age	(,000)	(,000)	%	(,000)	%
Total	**151,428**	**144,427**	**95.4%**	**7,001**	**4.6%**
16 to 24	22,394	20,041	89.5%	2,353	10.5%
25 to 34	103,565	99,762	96.3%	3,803	3.7%
55 to 64	19,985	19,389	97.0%	596	3.0%
65 and Older	5,484	5,325	97.1%	159	2.9%

Note. This table references private industry information for age by employment status for 2006, it is not inclusive of the entire civilian workforce. Source: (United States Department of Labor, n.d.). Note: this level of information was not available from the United States Census Bureau; therefore no state or county information could be reported for Oklahoma.

Table 6 reports for 2007 the number of employed and unemployed U.S. civilian workers by age as well as reflects the number of individuals not in the labor force. This table reflects that, overall, 63% of the 2007 civilian labor force was employed and that 32.4% was not in the labor force; those individuals not in the civilian labor force were either self-employed, government employees or worked on farms. In contrast, the 2006 and 2007 tables differ in that the age categories were divided differently in all four categories. However the one thing that remained constant was that the three categories for older workers maintained a higher level of employment.

Table 6. Employment of U.S. Workforce by Age

Age	2,007									
			Civilian labor force							
	Civilian noninstitutional population		Total		Employed		Unemployed		Not in labor force	
	(,000)	%	(,000)	%	(,000)	%	(,000)	%	(,000)	%
Total	231,687	100.0%	153,124	67.6%	146,047	63.0%	7,078	4.6%	78,743	32.4%
16-19	16,982	7.3%	7,012	50.5%	5,911	34.8%	1,101	15.7%	9,970	49.5%
20-24	20,427	8.8%	15,205	76.6%	13,964	68.4%	1,241	8.2%	5,223	23.4%
25-54	125,696	54.3%	104,353	83.6%	100,450	79.9%	3,904	3.7%	21,343	16.4%
55 and older	68,761	29.7%	26,554	61.1%	25,722	56.6%	832	4.5%	42,207	61.4%

Note. This table references the entire civilian workforce population for age by employment status for 2007. Source: (United States Department of Labor, n.d.). Note: this level of information was not available from the United States Census Bureau; therefore no state or county information could be reported for Oklahoma.

Gender

Table 7 reports for 2006 the number of employed and unemployed U.S. workers by gender. In total for 2006, both the female and male populations of the private industry workforce were employed at the exact same percentages, 95.4%.

Table 7. Employment by Gender in the U.S. Workforce

Gender	2006				
	Total	Employed		Unemployed	
	(,000)	(,000)	%	(,000)	%
Total	**151,428**	**144,427**	**95.4%**	**7,001**	**4.6%**
Female	70,173	66,926	95.4%	3,247	4.6%
Male	81,255	77,502	95.4%	3,753	4.6%

Note. This table references private industry information for gender by employment status for 2006, it is not inclusive of the entire civilian workforce. Source: (United States Department of Labor, n.d.). Note: this level of information was not available from the United States Census Bureau; therefore no state or county information could be reported for Oklahoma.

Table 8 reports for 2007 the number of employed and unemployed U.S. workers by gender as well as reflects the number of individuals not in the labor force. This table indicates that, overall, 63% of the 2007 civilian labor force was employed, 4.6% was unemployed and that 32% was not in the labor force; those individuals not in the civilian

labor force were either self-employed, government employees or worked on farms. However, the 2007 table calculated percentages based on the entire civilian, non-institutional population not just the private industry population. If one were to calculate the percentages based solely on the private industry population it would show that from 2006 to 2007 the percentage of employed individuals remained unchanged at 95.4%.

Table 8. Employment of U.S. Workforce by Gender

	2,007									
			Civilian labor force							
Gender	Civilian noninstitutional population		Total		Employed		Unemployed		Not in labor force	
	(,000)	%	(,000)	%	(,000)	%	(,000)	%	(,000)	%
Total	231,687	100.0%	153,124	66.0%	146,047	63.0%	7,078	4.6%	78,743	34.0%
Males	112,173	100.0%	82,136	73.2%	78,254	69.8%	3,882	4.7%	30,036	26.8%
Females	119,694	100.0%	70,988	59.3%	67,792	56.6%	3,196	4.5%	48,707	40.7%

Note. This table references the entire civilian workforce population for gender by employment status for 2007. Source: (United States Department of Labor, n.d.). Note: this level of information was not available from the United States Census Bureau; therefore no state or county information could be reported for Oklahoma.

Ethnicity

Table 9 reports for 2006 the number of employed and unemployed U.S. workers by ethnicity. In total for 2006, all four of the represented ethnicities of the private industry workforce were relatively equal in the employed category; range was 91% at the low end for African-Americans and 96.9% at the high end for Asians. However, when the 2006 category of unemployed was reviewed there was a significant gap between unemployed African-Americans, 9.0%, and unemployed Hispanics, Caucasians, and Asians. African-Americans were unemployed three times higher than Asians, 2.4 times higher than Caucasians, and 1.75 times higher than Hispanics.

Table 9. Employment by Ethnicity in U.S. Workforce

2006					
Ethnicity	Total	Employed		Unemployed	
	(,000)	(,000)	%	(,000)	%
Total	**151,428**	**144,427**	**95.4%**	**7,001**	**4.6%**
African-American	16,712	15,208	91.0%	1,504	9.0%
Asian	6,612	6,410	96.9%	202	3.1%
Caucasian	104,629	100,606	96.2%	4,023	3.8%
Hispanic	20,694	19,612	94.8%	1,082	5.2%
Other Ethnicities	2,781	2,591	93.2%	190	6.8%

Note. This table references private industry information for ethnicity by employment status for 2006, it is not inclusive of the entire civilian workforce. Source: (United States Department of Labor, n.d.). Note: this level of information was not available from the United States Census Bureau; therefore no state or county information could be reported for Oklahoma.

Table 10 reports for 2007 the number of employed and unemployed U.S. workers by ethnicity as well as reflects the number of individuals not in the labor force. This table indicates that, overall, 63% of the 2007 civilian labor force was employed, 3.0% was unemployed, and that 34% was not in the labor force; those individuals not in the civilian labor force were either self-employed, government employees or worked on farms. However, the 2007 table varied in two ways from the 2006 information. First, the 2007 information did not include all ethnicities; specifically, the Hispanic population was not individually represented. Due to this excluded data, this table was not accounting for approximately 5.3 million individuals. Second, the 2007 table calculated percentages based on the entire civilian, non-institutional population not just the private industry population. If one were to calculate the percentages just based on the private industry population for the ethnicities identified the employment rate would be identified as 95.4% which indicates no variation from the previous year.

Table 10. Employment of U.S. Workforce by Ethnicity

Ethnicity	2,007									
			Civilian labor force							
	Civilian noninstitutional population		Total		Employed		Unemployed		Not in labor force	
	(,000)	%	(,000)	%	(,000)	%	(,000)	%	(,000)	%
Total	226,371	100.0%	149,498	66.0%	142,682	63.0%	6,817	3.0%	76,874	34.0%
African-American	27,485	12.1%	17,496	63.7%	16,051	58.4%	1,445	8.3%	9,989	33.3%
Asian	10,633	4.7%	7,067	66.5%	6,839	64.3%	229	3.2%	3,566	32.5%
Caucasian	188,253	83.2%	124,935	66.4%	119,792	63.6%	5,143	4.1%	63,319	32.3%

Note. This table references the entire civilian workforce population for ethnicity by employment status for 2007. Source: (United States Department of Labor, n.d.). Note: this level of information was not available from the United States Census Bureau; therefore no state or county information could be reported for Oklahoma.

Education

Table 11 reports for 2006 the number of employed and unemployed U.S. workers by highest level of education completed. This table indicates a 1% higher employment rate, 96.4% versus 95.4%, than the previous information presented for 2006. The reason for this difference was because this table did not include those individuals between the ages of 16 and 24. One point of interest from this table was that the level of employment increased by approximately 2% as each level of completed education increased.

Table 11. Employment by Education of U.S. Workforce

2006					
	Total	Employed		Unemployed	
Education*	(,000)	(,000)	%	(,000)	%
Total	**129,034**	**124,386**	**96.4%**	**4,648**	**3.6%**
Less than high school diploma	12,758	11,892	93.2%	866	6.8%
High school graduates, no college**	38,354	36,702	95.7%	1,652	4.3%
Some college or associate degree	35,410	34,143	96.4%	1,267	3.6%
Bachelor's degree and higher***	42,513	41,649	98.0%	864	2.0%

Note. This table references private industry information for education by employment status for 2006, it is not inclusive of the entire civilian workforce. Source: (United States Department of Labor, n.d.). Note: this level of information was not available from the United States Census Bureau; therefore no state or county information could be reported for Oklahoma.
*Includes those persons over age 25, thereby creating a variance of approximately 22 million individuals
**Includes high school diploma or equivalent
***Includes bachelor's, master's, professional and doctoral degrees

Table 12 reports the 2006 employment status of four ethnicities by level of education. There were three interesting points in this table. First, the only group achieving less than a 92% employment rating was African-Americans with less than a high school diploma, 87%. The difference in level of employment among African-Americans spanned a range of 10% points based on highest level of education completed. Second, the Asian population was consistently employed at or above 96% regardless of the level of education completed. The employment span for this group based on level of education completed was 1.7% points. Third, both the Caucasian and Hispanic groups were relatively equal at each level of education, only separated by approximately 1% point, and the spans were relatively equal as well, 4.6% and 5.5% respectively for a difference of .9% points.

Table 12. Employment by Education and Ethnicity of U.S. Workforce

2006					
Education	Total	Employed		Unemployed	
	(,000)	(,000)	%	(,000)	%
Total*	118,133	113,969	96.5%	4,164	3.5%
African-American	14,000	13,054	93.2%	946	6.8%
Less than high school diploma	1,462	1,272	87.0%	190	13.0%
High school graduates, no college**	4,965	4,568	92.0%	397	8.0%
Some college or associate degree	4,301	4,032	93.7%	269	6.3%
Bachelor's degree and higher***	3,272	3,182	97.2%	90	2.8%
Asian	5,967	5,812	97.4%	155	2.6%
Less than high school diploma	446	429	96.2%	17	3.8%
High school graduates, no college**	1,050	1,017	96.9%	33	3.1%
Some college or associate degree	1,018	986	96.9%	32	3.1%
Bachelor's degree and higher***	3,453	3,380	97.9%	73	2.1%
Caucasian	89,938	87,216	97.0%	2,722	3.0%
Less than high school diploma	4,718	4,410	93.5%	308	6.5%
High school graduates, no college**	26,685	25,710	96.3%	975	3.7%
Some college or associate degree	25,779	24,976	96.9%	803	3.1%
Bachelor's degree and higher***	32,756	32,120	98.1%	636	1.9%
Hispanic	8,228	7,887	95.9%	341	4.1%
Less than high school diploma	1,128	1,042	92.4%	86	7.6%
High school graduates, no college**	2,519	2,397	95.2%	122	4.8%
Some college or associate degree	2,498	2,408	96.4%	90	3.6%
Bachelor's degree and higher***	2,083	2,040	97.9%	43	2.1%

Note. This table references private industry information for education by ethnicity by employment status for 2006, it is not inclusive of the entire civilian workforce. Source: (United States Department of Labor, n.d.).
Note: this level of information was not available from the United States Census Bureau; therefore no state or county information could be reported for Oklahoma.
*Data for ethnicities do not sum to totals because not all ethnicities are represented and this table only includes individuals age 25 and older. The variance is approximately 33 million individuals
**Includes high school diploma or equivalent
***Includes bachelor's, master's, professional and doctoral degrees

Turnover

Table 13 indicates the 2003 thru 2006 private industry turnover information at the national level as well as the state of Oklahoma and Oklahoma County. Over-all at the national level this table indicates that during this four year period turnover increased 3.7% with the Financial and Information industries posting the largest turnover numbers,

6.6% and 5.9% respectively, and Manufacturing posting the lowest turnover numbers of 1.6%. In contrast both the state of Oklahoma and Oklahoma County saw decreases in

Table 13. Private Industry Turnover Rates for Industries in U.S., Oklahoma and Oklahoma County

	2003		2004		2005		2006	
	(,000)	%	(,000)	%	(,000)	%	(,000)	%
National								
Total Private	45,136	41.6%	48,479	44.1%	51,286	45.8%	51,715	45.3%
Financial	1,899	23.8%	2,161	26.9%	2,134	26.2%	2,540	30.4%
Information	796	25.0%	927	29.7%	893	29.2%	944	30.9%
Manufacturing	4,350	30.0%	44,255	29.7%	4,469	31.4%	4,483	31.6%
All Other	38,091		1,136		43,790		43,748	
State								
Total Private	279	13.3%	269	12.4%	278	12.9%	295	13.1%
Financial	7	9.3%	7	8.5%	6	8.8%	7	9.1%
Information	5	9.9%	4	9.5%	5	12.7%	4	11.2%
Manufacturing	18	9.6%	16	7.8%	17	8.5%	21	9.3%
All Other	249		242		250		263	
County								
Total Private	84	13.7%	79	12.6%	81	13.1%	83	13.0%
Financial	3	10.3%	3	9.5%	2	9.3%	2	8.6%
Information	2	9.7%	2	10.7%	2	11.7%	2	11.5%
Manufacturing	4	9.2%	3	8.0%	3	8.7%	3	8.7%
All Other	75		71		74		76	

Note. This table references Turnover information for private industries calendar years 2003 thru 2006, it is not inclusive of the entire civilian workforce. Source: (United States Census Bureau, n.d.; United States Department of Labor, n.d.).

employee turnover during this same period. From 2003 to 2006 the state of Oklahoma saw an over-all .2% decrease in turnover where both the Financial and Manufacturing industries took slight decreases, .2% and .3% respectively, and the Information industry took an unfavorable increase of 1.3%. This same trend was also observed at the Oklahoma County level. Oklahoma County saw an over-all .7% decrease in turnover where both Financial and Manufacturing industries took decreases, 1.7% and .5% respectively, and the Information industry took an unfavorable increase of 1.8%. Since the category of All Other encompasses seven additional broad levels of industries it was

not realistic to provide a specific percentage for this category as each industry could have potentially had different individual levels of employee turnover.

Cost of Turnover

Workforce effectiveness can be negatively impacted by loss of qualified personnel, or "turnover." One source of worker turnover is retirement. Grantham, Ware and Williamson (2007) stated that in addition to the large number of Baby Boomers currently exiting the workforce there is another segment of the population known as *migrating workers* who also have the potential to create large knowledge voids in the workplace. Approximately 40 percent of this migrating population has indicated they are interested in seeking new job opportunities within the coming year (Grantham, Ware and Williamson). In addition to the turnover created by these two groups, "Almost half of all staffing directors reported that there are fewer qualified candidates available, and three-quarters expected increased competition for candidates" (Erker, 2007, p. 68) and "while employers think their new hires will stick around for about five years, their recent additions expect to be back on the market within two to three years" (p. 68). Consequently, the volume of associate turnover has the potential to have a huge monetary impact on organizations in the form of turnover costs.

Bliss (2007) claimed that if an organization wanted to get a true picture of what it costs to turn over an associate, there are six key areas to examine: (1) costs due to a person leaving, (2) recruitment costs, (3) new hire costs, (4) training costs, (5) lost productivity costs, and (6) lost sales costs. In determining the costs due to a person leaving, there are numerous costs to consider, most of which are never taken into consideration (Bliss, 2007; McPhillips-Jacka & Quinn, 2007). First, cost of the person

filling the vacant spot should be calculated. If this was an internal associate, then that person's normal productivity would be diminished, and over-time pay may be incurred. If a temporary person was brought in, there would be normal expenses associated with hiring a person through an agency. Second, the cost of lost productivity should be calculated. This should be calculated at 50% of the associate's salary and benefits compensation for each week the position is vacant, even if there were other associates covering part of the work load. The expense should be calculated at 100% if the position was not covered. Third, calculate all of the administrative and personnel time of conducting exit interviews, stopping payroll and benefits, and the cost of the manager who had to determine how to have the work covered so that the daily work flow was not interrupted. Fourth, calculate the expenses that were associated with training the new individual: internal training, external training, external academic education, and licenses and certifications. Calculate the cost of any severance and the cost of lost knowledge, skills, and contracts that this person may have taken upon leaving the organization. Bliss (2007) recommended this calculation be based on 50% if the person had one year or less time with the organization, and increasing this amount by 10% for each year of service. Sixth, calculate the impact of potential unemployment insurance premiums and time spent preparing for any litigation hearings. Last, if the person who left was a sales or customer service person, calculate the cost of losing customers or the expense to the organization to retain the customers.

When calculating the second area of recruitment costs specialists have identified five cost factors that should be included. First, consider the cost of print advertising, which could range from $200 to $5,000 depending on the market and method used, and

Internet advertising which could range from $300 to $500 per listing depending on the site (Bliss, 2007). Second, consider any potential agency fees. Agency fees could potentially range anywhere from 20% to 30% of the annual employee compensation (Bliss, 2007; McPhillips-Jacka & Quinn, 2007). Third, calculate the time invested by any staff recruiters and assistants in learning about the position, developing a resource strategy, preparing assessments and interview questions, reviewing resumes, conducting reference checks, scheduling physicals and drug screening, making travel arrangements and contacting employees to make final offers. This range of activities can consume, at a minimum, 30 to 100 hours of each person's time just to fill one position (Bliss). Fourth, calculate any time invested by an employee selection committed, this could be a minimum of 100 hours of total time (Bliss). Last, calculate the cost associated with all the third party verifications required by the organization: drug tests, physicals, criminal checks, educational checks, reference checks (Bliss). These costs must be calculated for every potential candidate on whom the cost is incurred, not just to the candidate to whom the offer of employment is extended.

Once the associate has been hired, the next two expense areas related to back-filling a vacated position are new hire costs and training costs. New hire costs include calculating the cost of putting the person on payroll, explaining the benefits program and signing the person up for benefits, creating security clearance, passwords, identification cards, business cards, and the cost of acquiring new or changing mobile phones, pagers, and automobile leases (Bliss, 2007). A second cost is that associated with the amount of time the manager or supervisor has to invest in order to build trust with the new associate.

According to Bliss (2007) training costs for new employees have four primary cost areas to consider. First, calculate the time the newly hired person spent in all training classes. This includes new hire orientation, departmental training and any additional licensing or certification training. Second, consider the time invested by the trainer. If it was an internal trainer, this person was potentially losing productivity elsewhere. If it was an external trainer, there was a monetary amount that should be considered. Next, consider all the mixed media materials that were needed to make a new hire productive in the position. Last, consider the time invested by the manager or supervisor in explaining and reviewing the new hire's work output and productivity. This was a loss in the supervisor's time and can have easily accounted for seven to eight hours per week until the new hire was fully up to speed.

The last two areas of cost associated with associate turnover relate to lost productivity and lost sales. Bliss (2007) offered two key pieces of information to consider when calculating lost productivity. First, consider how truly productive the new hire was during the first few weeks. During the first week there was no productivity, therefore the associate is 100% cost. During weeks two through four the associate was approximately 25% productive, so only 75% of salary and benefits was cost. As the associate moved to weeks 5 through 12 the associate was in a 50% - 50% split of productivity and cost. Weeks 13 through 20 moved this to a 75% - 25% split of productivity and cost. It was not until after week 20 that the new hire became a 100% productive associate. The second factor to consider when determining the cost of lost productivity was the down time and lost productivity of the manager, supervisor, peers and potential support staff who had to provide extra support to the new hire versus fully focusing on their own respective duties.

For the area of lost sales costs Bliss (2007) recommended that costs are determined based on the position that was vacated. Was the position a sales position, including inside and outside sales as well as telemarketers or non-sales position? If the vacated position was a sales position, divide the forecasted revenue per associate into weekly amounts and multiply that figure for each week the position is vacant. This also includes using the lost productivity calculations listed above until the new hire was fully productive. If the vacated position was a non-sales position, determine the revenue per associate by dividing the total company revenue by the average number of employees in a given year. Figure the lost revenue by multiplying the average weekly revenue per associate by the number of weeks the position is vacated. Regardless of an associate's position, sales or support, all associates are responsible for helping the organization grow revenue.

While the list of factors above is extensive, it is not exhaustive. Nor is it meant to imply that all the costs discussed above are associated with every vacated position. What should be taken from this information is that the costs associated with associate turnover have the potential to be quite significant and therefore have the potential to have a significant negative impact on the organization's bottom line. If one were to consider that turnover costs are approximately 150% of an associate's annual salary (McPhillips-Jacka & Quinn, 2007) it is not hard to see how quickly this number can manifest itself. As an example, in 2006 (see Table 13) the turnover for the Oklahoma County Financial industry was 2,540 individuals. Consider $30,000 as the average annual income for an individual working in the Financial industry in Oklahoma County, that would amount to a turnover cost of $45,000 per individual. If that calculation were expanded to all 2,540 positions

that were turned over in 2006, that would amount to $114,300,000. What organization would not like to remove this type of negative expenditure of funds? The costs of employee turnover highlight the importance of retaining associates by meeting their personal and learning needs

This is not to say that all turn over is bad or that in some cases it does not need to occur. However, when one looks closely at the expenses and impact associated with associate turnover it could be worth the time of organizational leaders to invest some time devising a plan or program which would promote the growth and retention of their current associates. A well devised plan could pay for itself in a relatively short period of time (Bliss, 2007).

Theoretical Framework for the Study

The proposed theoretical framework for this study was based on three conceptual areas: (1) Needs-Based Theory, (2) Adult Learning Theory, and (3) Instrumented Learning (see Figure 2). Needs-Based Theory and Adult Learning Theory were both conceptualized with several underpinning theories that concentrated on an individual's internal needs. These two theories were then combined with Instrumented Learning Theory as a way to address the need for a more effective individual workforce.

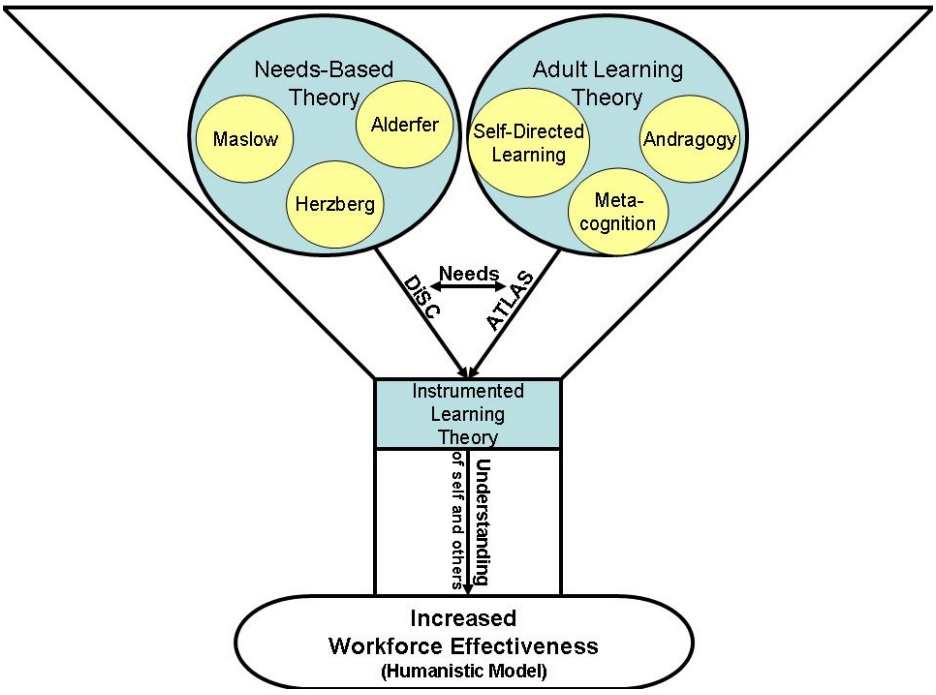

Figure 2. Proposed theoretical framework for this study: An approach to increased workforce effectiveness through meeting of individual needs

Needs-Based Theory

Many theorists, Victor Vroom, Abraham Maslow, Clayton Alderfer, David McClelland, Elton Mayo, Douglas McGregor, and Fredrick Hertzberg to name a few, have proposed the existence of internal needs within every individual. However, one of the most instrumental theorists for needs-based theory is Henry A. Murray. In 1938 Murray established a list which contained more than 20 motives associated with psychological and social needs (Lawler III, 1994). This list of motives would later provide the foundation for three needs-based theories that are significant to creating an effective workforce: Maslow's Hierarchy of Needs Theory, Alderfer's ERG Theory, and Hertzberg's Motivation and Hygiene Theory.

Maslow's Hierarchy of Needs theory. Abraham Maslow, a behavioral psychologist, first published his Hierarchy of Needs theory in 1943 (Lawler III, 1994;

Maslow, 1987). Maslow's Hierarchy of Needs theory states that an individual's needs are the main motivator in human behavior and that basic needs must be fulfilled before an individual can progress to more advanced needs (Deming, 2007; Maslow, 1987). Maslow's theory (Deming, 2007; Lawler III, 1994; Maslow, 1987) suggests that an individual's needs can be visualized in a hierarchy with each subsequent higher-level need providing the motivation as the current level need is met and that the individual is constantly in a state of motivation because as one need is satisfied another one has already been created to take its place.

Maslow's hierarchy consists of five levels (Deming, 2007; Lawler III, 1994; Maslow, 1987) (see Figure 3). Level one is the Physiological needs level. In this level the individual is concerned with basic survival needs such as food, water, shelter, oxygen, and sex. In the second needs level, Security, the individual needs to feel protected from dangerous situations, needs stability, and needs to feel absent of pain or illness. Membership needs are the focus of level three. Here the individual is concerned with being part of social groups and the feelings of inclusion, belonging and love. Level four addresses the issue of Esteem needs, which include self-esteem and public-esteem. The last needs level is that of Self-actualization; this is where the individual is intent on becoming all that is possible.

Deming (2007) related Maslow's theory to human brain physiology. He asserted that in addition to psychological research, Maslow's theory has also been supported by over two decades of brain research:

> The brain is really a triune brain. One brain, called the stem or reptile brain takes care of three things: physical needs, survival, and sex. It ensures that the species continues. The second part of the brain is called the limbic system. This part of the brain takes care of emotions. The third

> part of the brain is called the neocortex or the cerebrum. This is where purpose, creativity, and logic – the things we want to believe we are paying attention to – occur. The triune brain – physical, safety, sex, then emotions, then logic and creativity – follows Maslow's hierarchy of needs. (p. 3, ¶ 3)

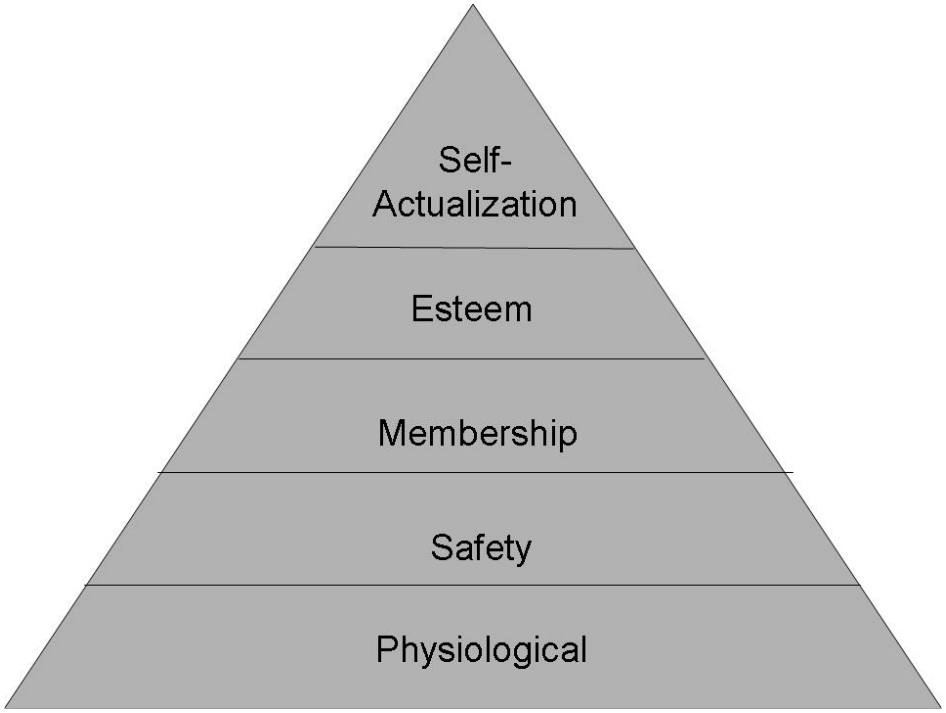

Figure 3. Maslow's Hierarchy of Needs. Source: (Deming, 2007, p. 2).

In the business world it is leadership's responsibility to assess how to keep each individual associate in the upper-level of Maslow's hierarchy and how to best utilize various talents and skills. This suggests that each individual must have his physical needs met, feel safe, and have a feeling of belonging. Maslow's theory indicates that only then can an associate begin to grow in the areas of esteem and self-actualization.

Alderfer's ERG theory. In 1969 Alderfer redesigned Maslow's Hierarchy of Needs and proposed the ERG Theory (Alderfer, 1972; Lawler III, 1994). In his theory, Alderfer states that there are essentially three core needs: (1) Existence, which includes

all the various forms of material and physiological desires; (2) Relatedness, which involves significant other individuals, self-esteem and social needs; (3) Growth, which propels an individual to create innovative or dynamic effects on the environment or himself. A comparison of the levels of needs proposed by Maslow and Alderfer is shown in Figure 4.

Like Maslow, Alderfer contends that satisfaction of a need heightens its importance and the importance of higher-level needs (Alderfer, 1972; Lawler III, 1994). He also agrees with Maslow's hypothesis that the satisfaction of growth needs make them more important, not less important (Alderfer, 1972; Lawler III, 1994). However, Alderfer's theory differs from Maslow's theory in four fundamental ways.

Figure 4. Alderfer's ERG Theory and Comparison with Maslow's Hierarchy of Needs Theory. Source: (Alderfer, 1972, p. 25)

First, Alderfer's theory has three categories while Maslow's has five (see Figure 4). Alderfer contended that there is some ambiguity in Maslow's categories. Alderfer's

position is that “safety needs to overlap with both physiological needs and love needs” (Alderfer, 1972, p. 24) and that esteem needs need to overlap with love and self-actualization needs (p. 24). Alderfer places material safety needs in his Existence category and interpersonal safety needs in his Relatedness category; he places interpersonal esteem in his Relatedness category and self-confirmed esteem in his Growth category (Alderfer, 1972).

Second, Alderfer proposed that “the lack of satisfaction of higher-order needs can lead to lower-order needs becoming more important” (Lawler III, 1994, p. 37). Next, he also argued that “the importance of any need is influenced by the satisfaction/frustration of the needs above and below it in the hierarchy” (p. 37). Fourth, Alderfer argued that “all needs can be simultaneously active; thus prepotency does not play a major role in his theory as it does in Maslow’s” (p. 37).

In relation to industrial and corporate organizations, Alderfer’s theory can be interpreted to mean that an individual in an instructional or leadership role must recognize that each associate has multiple needs that need to be simultaneously satisfied. According to the ERG Theory, if an instructor or leader only focuses on one need at a time the associate may not be effectively motivated and may regress into lower-levels of need thereby becoming less productive.

Hertzberg’s Motivation and Hygiene theory. Frederick Herzberg, a clinical psychologist, was a contemporary of Abraham Maslow. While Maslow explored the order and satisfaction of assorted needs and how individuals pursue these needs, Herzberg was exploring a theory regarding the increasing importance of the needs esteem and self-actualization, levels four and five of Maslow’s hierarchy of needs.

During the 1950s and 1960s, Herzberg decided to examine and research the primary factors affecting an individual's performance in the workplace (Hertzberg, 1967; Hertzberg, Mausner, & Snyderman, 2007; Lawler III, 1994). His theory was originally developed by interviewing 200 accountants and engineers to gain their perspectives on work motivators, attitudes and relationships (Halepota, 2005; Hertzberg, 1967). As a result of this study Herzberg discovered there are two factors that cause motivation or demotivation in an organization (see Figure 5). In Hertzberg's theory, Motivational factors are referred to as job enrichment factors and include: achievement, recognition, responsibility, advancement, and work itself (Halepota, 2005; Hertzberg, 1967; Hertzberg et al., 2007). Demotivational factors are referred to as hygiene factors. These factors include: status, security, salary, supervision, personal life, organizational policies, and relationships with subordinates, peers and supervisors (Halepota, 2005; Hertzberg, 1967; Hertzberg et al., 2007). These factors do not directly motivate workers; however, their absence can be demotivating.

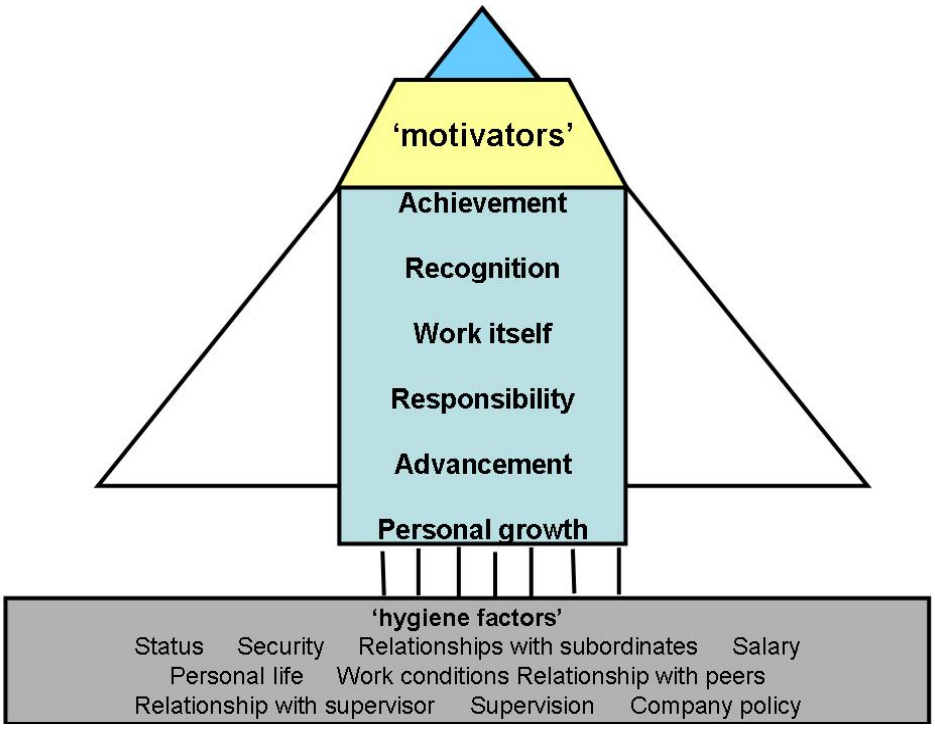

Figure 5. Herzberg's Motivation and Hygiene Theory. Source: (Chapman, 2003).

Since its initial debut, much research has been directed towards testing the Motivation and Hygiene theory. Much of the attention can be attributed to two aspects of the theory which are quite unique. First, the Motivation and Hygiene theory states that satisfaction and dissatisfaction do not exist on a continuum running from satisfaction on one end, through neutral, and on to dissatisfaction on the other end; the two forms are actually on independent continua, one running from satisfied to neutral and the other running from neutral to dissatisfied (Lawler III, 1994). Second, the Motivation and Hygiene theory emphasizes that different facets influence feeling of satisfaction or dissatisfaction (Lawler III, 1994).

An important aspect of the Motivation and Hygiene theory is that a person can be very satisfied and very dissatisfied at the same time. The theory also implies that factors such as improved working conditions, better technical supervision, increased salary,

security, or improved relationships with supervisors, peers or subordinates may impact the amount of dissatisfaction that is experienced; however, none of these factors will either cause or increase the level of satisfaction that is experienced. According to this theory, the only way to increase satisfaction is by implementing changes that will impact the motivational factors.

An important concept for organizational instructors and leaders to take from this theory is that hygiene factors do not cause employee satisfaction. Even though the increase of hygiene factors, or removal of issues with these factors, may make an individual more productive, these increases/removals will not serve as a motivational factors. Many leaders believe that motivation comes from giving rewards, usually in the form of monetary rewards. This is in direct contrast to Herzberg's theory which states that achievement, recognition, responsibility, advancement, and work itself are the most effective ways to motivate an associate.

Adult Learning Theory

Since the 1920s there has been one question that has provided the foundation for research in the field of adult education: Can adults learn (Merriam, 2001a)? In the 1970s and 1980s Malcolm Knowles began to explore the concept of adult learning (Merriam, 2001b) and asking more specific questions. Do adults learn differently from children? What are the distinguishing factors? What facets of adult learning can be identified and utilized to effectively maximize adult learning? What Knowles discovered and proposed was that there are two main constructs of adult learning theory: andragogy and self-directed learning. These two constructs are now known as the two main pillars of adult learning theory (Merriam, 2001a).

Andragogy. The first pillar of adult learning theory was introduced from Europe in 1968 by Malcolm Knowles. More than 30 years ago Knowles (1968, p. 351) suggested a "new label and a new technology" of adult learning to distinguish it from pre-adult learning. The concept of andragogy, "the art and science of helping adults learn," was contrasted with pedagogy, the art and science of helping children learn (Knowles, 1980, p. 43). Merriam and Caffarella (1999) and Merriam (2001a) assert that there are five assumptions underlying the theory of andragogy. First, as an individual matures his self-concept moves from that of a dependent personality toward one of self-directedness. Second, an adult accumulates a growing reservoir of experiences which is a resource for learning. Next, the readiness of an adult to learn is closely related to the developmental tasks of his changing role in society. Fourth, there is a change in time perspectives as an individual matures – from future application of knowledge to immediacy of application. Last, internal factors, not external factors, serve as the motivating force for adults.

In the 1970s and 1980s there was much debate and discussion on two topics regarding the validity of andragogy as an actual theory of adult learning (Merriam, 2001a; Merriam & Caffarella, 1999). The first topic was whether or not andragogy could be considered a "theory" of adult learning. One of arguments was that andragogy had been classified "as a theory of adult education, theory of adult learning, theory of technology of adult learning, method of adult education, technique of adult education, and a set of assumptions" (Davenport & Davenport, 1985, p. 157 as cited in Merriam, 2001a). After hearing such arguments, Knowles changed his position that andragogy was a theory and posited that it was more of a model of assumptions about learning that serves as a framework for an emergent theory (Merriam, 2001a).

The second topic of debate, which is still in contention today, is the degree to which the assumptions of andragogy only apply to adult learners (Merriam, 2001a; Merriam & Caffarella, 1999). After much inquiry and analysis of his five assumptions of andragogy by educators both in and out of the field of adult education, Knowles stepped down from his original position that andragogy was only a characteristic of adult learners and learning. In a later work, Knowles (1980) proposed that pedagogy and andragogy are not two entirely different concepts measured on different continua, but rather two opposite ends of the same continuum. This acknowledgement by Knowles changed the concept of andragogy from one defined by the type of learner, adult or child, to one defined by the learning situation and technique.

Self-direct learning. The second pillar of adult learning theory was introduced by Allen Tough in the 1960s and 1970s (Tough, 1979). His work was viewed as the first comprehensive description of self-directed learning as a form of study (Merriam, 2001a, p. 289). Initially, research in self-directed learning consisted of four areas of emphasis (Merriam & Caffarella, 1999, p. 289). The first emphasis focused on verifying that adults intentionally learned on their own and examined how adults went about the learning process. Following this initial exploration and mining of data, researchers started providing more complex conceptual models of self-directed learning. Next researchers debated over what the goals of self-directed learning should be and began exploring the individual characteristics of those who were viewed as self-directed learners. The last task that researchers were interested in was bringing greater clarity to the term “self-directed learner”.

What is clear from the research done on this theory is that the major facets of self-directed learning can be clarified in three broad categories (Merriam & Caffarella, 1999). The first category addresses the three primary goals of the self-directed learning: "(1) to enhance the ability of adult learners to be self-directed in their learning, (2) to foster transformational learning as central to self-directed learning, and (3) to promote emancipatory learning and social action as an integral part of self-directed learning" (p. 290).

The second category addresses self-directed learning as a learning process in which learners "take the primary initiative for planning, carrying out, and evaluating their own learning experiences" (Merriam & Caffarella, 1999, p. 293). This category also contains three models for self directed learning: (1) Linear models where learners progress through a series of sequential steps to reach their learning goals (p. 293); (2) Interactive models where the process is not so well defined or linear in nature. Here the emphasis is on the personality characteristics of each learner, their cognitive processes and the context of learning. These components all come together to establish the environment for the self-directed learning (p.295); (3) Instructional models which represent frameworks that instructors in formal education settings could use to integrate self-directed methods into their programs and activities. This approach allows for more learner control and independence with the two settings (p. 302). The final category addresses self-direction as a personal attribute of learners. The assumption underlying this category is that learning means becoming more self-directed and self-governing (p. 305).

In summary, there are at least three ways in which both andragogy and self-directed learning contributing to the knowledge of adult learning; thus making them the strongest pillars of the adult learning theory (Merriam, 2001b):

> First, the *adult learner* is seen wholistically. The learner is more than a cognitive machine processing information. He or she comes with a mind, memories, conscious and subconscious worlds, emotions, imagination, and a physical body, all of which can interact with new learning. Second, the *learning process* is much more than the systematic acquisition and storage of information. It is also making sense of our lives, transforming not just what we learn but the way we learn, and it is absorbing, imagining, intuiting, and learning informally with others. Finally, the *context* in which learning occurs has taken on greater importance. Not only can we see learning as situated in a particular context, but we can examine how race, class, gender, power and oppression, and conceptions of knowledge and truth shape the context in the first place and subsequently the learning that occurs. (p. 96)

Metacognition Theory. Several internationally known researchers and their psychological theories have led the way for the field of Metacognition. According to Son, (2007) The two most influential are Lev Vygotsky for his work in the late 1930s through late 1970 in the area of learner-centered learning and Jean Piaget in the 1970s and 1980 for his work in classifying the stages of cognitive development. Although the works of these two researchers laid the foundation for metacognition, it was psychologist John Flavell who would make the most important discoveries in this field (Son, 2007). Flavell (1976) provided the following definition of metacognition:

> Metacognition refers to one's knowledge concerning one's own cognitive processes and products or anything related to them, e.g., the learning relevant properties of information or data… Metacognition refers, among other things, to the active monitoring and consequent regulation and orchestration of these processes in relation to the cognitive objects on which they bear, usually in the service of concrete goal or objective. (232)

The origins of metacognitive theories are thought to be rooted in three distinct areas: (1) Cultural learning, which predicts that metacognitive theories are internalized

from one's culture through social learning; (2) Individual construction, which states that much of what an individual knows about cognition, occurs aside from formal education; (3) Peer interaction, which engages a level of social construction that is different from both cultural learning and individual construction, even though it may be influenced by cultural processes (Schraw & Moshman, 1995).

A variety of criteria have been utilized for discerning the attributes of various theories. Schraw and Moshman (1995) suggested there are two primary attributes of metacognitive theory. The first primary attribute is that it permits an individual to combine diverse characteristics of metacognition in a single framework (p. 357). The second attribute is that metacognitive theories harmonize beliefs that allow an individual to predict, control and explain his cognition or the cognition of others (p. 358). The extent to which a metacognitive theory encompasses these attributes and the degree to which an individual is aware of these attributes varies from individual to individual, and metacognitive theories vary over time as one experiences life events and engages in self-reflection (p. 358).

Metacognition is an important characteristic for processing information, with major implications for industrial and corporate settings (Kleitman & Stankov, 2007). Most theories of metacognition distinguish between the knowledge of cognition and regulation of cognition (Schraw & Dennison, 1994; Schraw & Moshman, 1995; White & Frederiksen, 2005). Knowledge of cognition is awareness about one's own cognitive processes as well as how, when and why to utilize strategies that will engage cognitive resources and generally encompasses three different types of awareness: (1) Declarative, which includes knowledge about one's self as a learner and the factors that influence

one's performance; (2) Procedural, which refers to the knowledge about implementation of procedural skills; (3) Conditional, which refers to knowing when and why to apply cognitive actions (Brown, 1987; Schraw & Moshman, 1995).

Regulation of cognition refers to activities that assist in controlling an individual's learning. There are three processes of metacognitive regulation: (1) Planning, which involves the selection of appropriate strategies and the allocations of resources that affect performance; (2) Monitoring, which refers to an individual's awareness of comprehension and task performance; (3) Evaluation, which refers to appraising the performance after the completion of the task (Conti & Kolody, 1999; Efklides, 2006; Fellenz & Conti, 1989; Schraw & Dennison, 1994; Schraw & Moshman, 1995).

Metacognition demands the ability of an individual to be introspective about personal performance and the ability of an individual to distinguish personal perspectives from those of others. Brown, (1978) asserted that by examining the metacognitive development of an individual, not only will false barriers between traditional cognitive domains be lessened, but barriers across various distinct areas of inquiry may also be removed. Brown (1978) also claimed that this weakening and removal of barriers will be of great value if the industrial or organizational instructor is acutely focused on the development of the whole person, not just the development of isolated skills.

Instrumented Learning Theory

The concept of instrumented learning theory began to develop in the mid 1950s and spawned the invention of learning instruments (Blake & Mouton, 1972a). Instrumented learning refers to the process by which an instructor utilizes various tools to facilitate learning and often do more than an instructor can do by way of providing a

learning experience (Blake & Moulton, 1972a, 1972b). This new approach to learning provides the instructor with three distinct reasons to utilize instrumented learning (Blake & Moulton, 1972a, 1972c). First, the instruments provide the instructor with specific information that can be used to coach a learner's performance. When the instructor is providing an individual with specific information regarding personal responses or feelings the learner will not feel as threatened and is more likely to modify necessary behaviors. Second, the instruments provide a way to objectively assess a learner's behaviors versus an instructor providing his subjective opinion. When presented with facts, instead of opinions, learners will be more willing to discuss their feelings or attitudes. Last, learning instruments provide a means for longitudinal assessment. This allows both the instructor and the learner to examine progress and assess where additional revisions may need to be made.

Learning instruments are very flexible, may be utilized for various types of learning situations, and are available using a variety of techniques. Blake and Mouton (1972a, 1972b) stated that the most common techniques include: (1) Rating, which ask a learner to place a value on how often something is done or possibly the degree to which something is favored; (2) Ranking, which requires a learner to rank in a particular order (i.e., highest to lowest, or most important to least important) the value associated with the items listed; (3) Forced choice, which requires a learner to choose one thing over another; (4) Sentence completion, which takes on a more open-ended approach by giving a learner the stem of a sentence and then requiring the learner to write in the remainder of the sentence based on what would be done if actually presented with a specific situation; (5) Multiple-choice, which provides a learner a situation or question and a list of three to five

possible answers and requires the learner to select the answer that most closely aligns with the way the situation would be addressed or the question answered if it were presented in reality.

Learning instruments also allow the learning process to go "from a teacher-tell approach to a self-oriented learning orientation" (Blake & Mouton, 1972a, p. 17). In the traditional classroom, the instructor is the center of knowledge and he tells, lectures, or demonstrates exactly what the learner needs to know or do. The learner listens and practices the skills and is then tested and graded on how well the information was learned. The contrast to that is what Blake and Mouton (1972a, 1972c) refers to as a four-phase cycle of experience: Dilemma, Invention, Critique and Generalization, which transforms the instructor into a "Learning Manager" (1972a, p. 17) and transforms the learner into a self-directed learner. The Dilemma phase is "concerned with confronting *dilemmas* – thought-provoking predicaments – and discovering how to solve them" (1972a, p. 17). The Invention phase requires that the learner assess each dilemma and devise possible solutions or outcomes (1972a, 1972c). The Critique phase consists of either: (a) feedback from others on the observed actions of the learner and how those actions impacted them, or (b) self-assessment where the learner reflects on personal actions and assesses them in relation to the desired results (1972a, 1972c). The last phase of the cycle is Generalization. This occurs when the learner "is able to see how a specific experience or a specific set of facts fits as a basis for integrating a larger class of experiences or knowledge" (1972, p. 18). Generalization is the end of the cycle; however the applications must become integrated into the learner's skill set if they are to be

considered learned. “When a person is deliberately trying to apply principles he has learned, he is in the best position to ‘learn from experience’” (Blake & Mouton, p. 18).

Although there are some very strong arguments for the implementation and use of instrumented learning, an instructor would be remiss if he did not also explore the concerns that are associated with this theory. First, traditionally, direct observation methods based on machines or skilled observers have been viewed as objective approaches to measurement, and self-reported methods have been viewed as generating more subjective data (Critchfield, Tucker, & Vuchinich, 1998). Second, there is an innate suspicion of self-report data because the individual providing the information could, either intentionally or unintentionally, report biased data (Baldwin, 1999). However, despite these concerns, industrial and corporate hiring and training personnel continue to increase their use and reliance on self-report assessments because, in most cases, there is just no other way to gather the information (Baldwin, 1999).

Learning Strategies

Individuals have a propensity to approach real-life learning situations with various learning strategies (Conti & Kolody, 1999). Learning strategies have been defined by Fellenz & Conti (1989) as external behaviors that each individual develops through personal experience and whereby the learner makes a conscious decision to use said strategies to accomplish a learning task. Many learning strategies exist because there are various types of learning styles.

Some of the differences between learning styles and learning strategies have been identified in the literature. Learning styles address the various ways of approaching tasks which are characteristic of individuals, whereas learning strategies are ways to address or

complete a specific learning task or situation. Learning styles refer to the way an individual processes information, whereas learning strategies address the way an individual approaches a specific learning task (Conti & Kolody, 1995). Learning styles focus on the individual, whereas learning strategies focus on the task (Schmeck, 1988). Learning strategies are also different from learning styles in that strategies use external aids, such as notes, recording, or pictures, that assist the individual in organizing and retaining information (Weinstein, Goetz, & Alexander, 1988).

For adult learners, the function of learning strategies has been linked to real-life learning situations (Conti & Kolody, 1999) such as those found in the workplace. Learning strategies are techniques and skills that each individual decides to utilize in order to successfully complete a specific learning task. The strategies used will vary from individual to individual and also vary depending on the learning purpose. Generally, the strategies an individual uses are so routine and customary that little to no thought is given; however, sometimes much consideration and deliberation must occur before a specific learning strategy is selected for a specific learning task (Fellenz & Conti, 1989).

Learning Strategies Development: SKILLS Instrument

Extensive learning strategies research, such as that conducted by Conti and Kolody (1995, 1998, 1999) and Fellenz and Conti (1989, 1993) has identified five vital areas of learning strategies using the *Self-Knowledge Inventory of Lifelong Learning Strategies (SKILLS)* assessment. SKILLS is an instrumented learning tool used in the field of adult education that was specifically developed to measure these five key areas of Metacognition, Metamotivation, Memory, Critical Thinking, and Resource Management (1993). SKILLS is comprised of 15 learning strategies that are split among these five

learning areas. On the SKILLS instrument, individuals are asked to read each one of six learning scenarios and then answer the 15 questions at the end of each scenario. There are three questions from each of the five learning areas. The responses to these questions are then assessed to determine the specific learning strategy an individual used to solve the problems (Fellenz & Conti, 1993).

Metacognition

In research by Fellenz and Conti (1989), the concept of metacognition was analyzed by observing learners who had the ability to reflect upon and ultimately control their learning processes. In this same research, Fellenz and Conti (1989) went on to state that the learners who were conscious of the learning processes exercised more control over those processes and ultimately became more effective learners.

Related to the cognitive domain, Fellenz and Conti (1989) claimed that metacognition is generally defined as knowing about one's personal process of learning and thinking. It is a conscious, reflective venture and it is one that requires the learner to analyze, assess and manage learning activities. Merriam and Caffarella (1999) asserted that metacognition is often regarded as the highest level of mental activity and is necessary for intricate problem solving.

According to several researchers, metacognition has three components: Planning, Monitoring, and Evaluation (Conti & Kolody, 1999; Efklides, 2006; Fellenz & Conti, 1989; Schraw & Dennison, 1994; Schraw & Moshman, 1995). Planning suggests that the learner is self-directed enough to take responsibility for learning and can systematize the steps necessary to accomplishing the learning tasks. Monitoring means the learner must check the progress of the learning activities to determine whether or not the learning is

progressing at the desired rate of speed. Some tools that can be used for monitoring include self-tests, progress comparison, feedback, using resources, and tracking logs (Conti & Kolody, 1999; Fellenz & Conti, 1989). Evaluation refers to amending the original learning plan based on the observed results from the Monitoring component and then implementing new strategies as necessary. Conti and Kolody (1999) stated that metacognition is "a conscious, reflective endeavor; it is one that requires the learner to analyze, assess and manage learning activities" (p. 3).

Over time learners mature, and some researchers believe that through this maturation process the metacognitive process also develops. This development is done naturally as learners experience new and varied changes or demands in their cognitive skills and abilities. Depending on the resources, activities and strategies employed, learners ultimately decide how much they learn (Phye & Thomas, 1986).

Metamotivation

Fellenz and Conti (1993) define metamotivation as the awareness and control of factors that strengthen and direct one's learning. Metamotivation relates to learners being aware of and contemplating why they are motivated to participate in a learning situation. Motivation is regarded as an aspect that shapes adult learning. According to McCombs (1998), "An important functional role of motivation is to contribute to the maintenance of positive self-views and perceptions of self-efficacy and personal control that underlie the ability to change negative attitudes toward learning" (p. 142).

Deci and Ryan (1985) described energy and direction as two factors that influence motivation. Energy refers to the needs that are intrinsic to the individual and those that are acquired through interaction with the environment. Direction refers to the process and

structures of the behavior; thus giving each individual internal and external stimuli. Focusing on the internal processes associated with adult education and learning, motivation in adult learning situations has been referred to as "metamotivation." In order to differentiate the concept from external motivation, which is more prevalent in traditional learning situations, the prefix "meta" is used to denote "internal" (Fellenz & Conti, 1989).

Related to the affective domain, metamotivation is comprised of three components: Attention, Reward/Enjoyment, and Confidence (Conti & Kolody, 1999). Attention refers to a learner setting aside time and focusing on the material to be learned without distractions. Generally individuals split their attention between two or more areas at the same time and in varying degrees. One way to remove unwanted distractions is to set a specific location and time for uninterrupted study (1999).

Reward/Enjoyment refers to identifying the value one places on learning specific material, having fun or experiencing some level of satisfaction with learning (Conti & Kolody, 1999). An example of Reward/Enjoyment is taking pride in personal accomplishments growth (1999). Confidence refers to the learner's belief in personal ability to successfully complete the learning task and belief that the task is worth completing (1999).

Wlodkowski (1985) related motivation to time and developed a learning model based on a time continuum which he named "The Time Continuum Model of Motivation." In this learning model, there is always a beginning, middle, and end. According to Wlodkowski, any one of these three phases can influence learner motivation. According to Wlodkowski, beginning learning processes are attitude needs;

middle learning processes are stimulation affect; and ending learning processes are competency reinforcement (pp. 60-61). Wlodkowski (1985) went on to state that for learning to occur the instructor must have ability and provide quality instruction. Without these two components, no matter how motivated, learners would be unable to accomplish their learning goals. Motivated learners work longer and harder, and with more vigor and intensity than those who are not motivated. Furthermore, when learners are motivated more concentration and care occur in the learning process and this has a profound psychological affect to the learning of material (Wlodkowski).

Memory

Memory is "the capacity of humans to retain information, to recall it when needed and recognize its familiarity when they later see it or here it again" (Wingfield & Byrnes, 1981, p. 4). At its most basic level, memory refers to the ability to recall what has been learned; at a more intricate level it is the adhesive that holds one's consciousness together (Lemme, 2006). Memory is "viewed in its relationship to adult learning and the influence it can have on decision making and consequent human behavior" (Paul & Fellenz, 1993, p. 24).

Within the perspective of learning, memory processes, acquisitions, structure storage, retention, and retrieval are critical components (Conti & Fellenz, 1991) and are reciprocally reinforcing of each other. For example, if a person does not acquire new knowledge there is nothing to store for future use. If there is nothing stored, there is nothing to retrieve. If there is nothing to retrieve, there is no knowledge. These processes may be enhanced by or accomplished using either internal or external memory aids. Internal memory aids are strategies used by the individual utilizing one's own processes

or methods. External memory aids are techniques that rely on the interaction of the cognitive processes of the individual and the manipulation of the situation or environment to guarantee recollection (Paul & Fellenz, 1993). The three Memory components of the SKILLS instrument include: Organization, External Aids, and Memory Application (1993).

Organization strategies aid in processing information so that it can stored, retained and retrieved more easily and effectively (Conti & Kolody, 1999). One commonly used organizational technique is called chunking. Chunking is the process of organizing information into groups or subsets so that like items or thoughts are put together, thereby creating fewer categories of data (Fellenz & Conti, 1993). Conti and Kolody (1999) stated that when information is chunked, it is easier for the learner to work with and remember larger amounts of data. External Aids include such items as calendars, day planners, to do lists, and visual reminders such as post-it notes. Use of these types of strategies allows an individual to utilize the environment to enhance recollection. Memory application, such as mnemonics, refers to internal cues an individual can utilize to enhance memory. Mnemonic devices include rhymes, songs, phrases or rhythms. Examples of mnemonic devices might include the ABC song, the sentence learned to remember the order of the planets, or the poem learned to remember parts of the periodic table of elements. In adult learning, memory application is used heavily for critical thinking and problem solving (Paul & Fellenz, 1993).

Critical Thinking

Critical thinking examines how an individual differentiates and reflects upon new information. Conti and Kolody (1999) referred to critical thinking as a reflective process

whereby the learner utilizes higher order thinking skills in order to enhance and improve the learning process. While problem-solving and decision-making are, at times, incorporated into the higher-order thinking process, Fellenz and Conti (1993) asserted that critical thinking has the more important goal of improving individual and societal learning. They pointed out that our society continues to advance deeper and deeper into the information age, thereby causing our value and appreciation for higher order thinking skills to increase (1993).

Brookfield (1987) developed a model of critical thinking, based on four components, which were used in the development of SKILLS. These four components are: (a) Identifying and challenging assumptions based one's own conclusions, not merely what one is told; (b) Challenging the importance of context, because what has worked previously or in a different situation may not be the best solution for the current situation or the future; (c) Imagining and exploring alternatives ways and means by brainstorming ideas, either alone or as part of a larger group; (d) Reflective skepticism which means one does not accept knowledge or information based solely on claims of universal truth.

The SKILLS critical learning strategies incorporated these components as: (a) Testing Assumptions, (b) Generating Alternatives, and (c) Conditional Acceptance. Testing of assumptions refers to the process of the learner challenging what is presumed to be true and the willingness to test these assumptions (Conti & Kolody, 1999; Fellenz & Conti, 1993). The SKILLS assessment uses several activities to assess whether or not the learner challenges the assumptions presented in real-life learning situations. These activities permit the learners to "examine the accuracy or the acceptance uncritically

given to an assumption, while others prompt them to identify relationships, spot inconsistencies, or question value sets" (Fellenz & Conti, 1993, p. 32).

Generating Alternatives entails exploring alternatives when engaged in the critical thinking skills necessary for addressing the complex situations which arise as part of one's real-life (Conti & Kolody, 1999; Fellenz & Conti, 1993). The SKILLS assessment examines the learner's preference to hypothesize while grounding options within a given situation and include strategies such as brainstorming, identifying alternative solutions, and ranking those solutions (Fellenz & Conti, 1993). Conti and Kolody (1999) refer to Conditional Acceptance as "advocating reflective skepticism to avoid absolutes or over simplifications" and state that conditional acceptance is measured by "monitoring results and evaluating consequences" (p. 8). The SKILLS model uses these strategies, along with other activities like questioning one-dimensional answers and predicting consequences as ways to assess conditional acceptance.

Resource Management

Several of the learning strategies used in the SKILLS assessment address the successful use of resources in effort to supplement the learning experience (Conti & Kolody, 1999). Resource Management is comprised of three components: (a) Identification of Resources, (b) Critical Use of Resources, and (c) Use of Human Resources (1999). Identification of Resources refers to "the identification and location of the best possible source of information which may include modern information, sources, print sources, people, models, processionals or agencies" (1999, pp. 8-9). One of the primary concerns of the learner at this point is whether or not to use a particular source. Hill (1992) pointed out those learners who are more familiar with surfing the Internet

may choose this method of investigation versus going to the library or on-line library and conducting their investigations by utilizing peer reviewed journals. However, whichever way the learner chooses to proceed, the learner must assess whether or not the time, and energy invested yield the best and most reliable data.

According to Conti and Kolody (1999) Critical Use of Resources involves "critical reflection about the material and selection of the most appropriate resources rather than simply those that are readily available" (p. 9). Some items one should consider include: (a) How recent is the material? (b) Is the source biased? (c) Is the material truthful? Some ways to address these issues include looking at the issue or publication date of the material; identify if there are there other authors, researchers or experts who concur with the article in question; and if possible contacting the author and asking clarifying questions.

The third component of Resource Manages is the Use of Human Resources, or how one incorporates others into the learning process. The Use of Human Resources refers to more than just including others in the learning environment. According to Fellenz and Conti(1993), it means one engages in "dialogue that involves listening to people with different opinions or insights into issues as well as the use of discussion to think through or study problems. In some situations, the support provided by human resources may be as important as the information they contribute" (p. 37). Conti and Kolody (1999) claimed this support and networking are important in the measurement of a learner's preference in incorporating the use of human resources in their learning process.

Learning Strategies Development: ATLAS Instrument

After the development of SKILLS in 1991, numerous studies were conducted with diverse populations. Conti (in press) stated that collectively, these studies produced two important findings. First, the studies found that demographic variables were not useful in discriminating among different groups in their learning strategy preferences. Second, the studies consistently found that distinct groups of learners existed when they were identified by the pattern of learning strategies the learners used. In combination these two findings indicated that patterns of learning strategy use cut across both age and gender, two commonly used demographics in education studies. The studies found that placement in a learning strategy group was dependent on the strategies people choose to use; it was not predetermined by other factors. Thus, when learners enter into a learning task they have flexibility in the learning strategies they choose to use. The research indicated that when learning strategies were defined by the five concepts in SKILLS, there were clear patterns in the learning strategies learners have a predisposition to use when beginning a learning situation (Conti, in press).

In light of this information, a project was undertaken to develop an instrument for identifying the pattern of learning strategy usage of learners. The goal of this project was to develop an instrument that was easy to administer, could be completed quickly, and could be used immediately by both facilitators and learners. The instrument developed was ATLAS (***A****ssessing* ***T****he* ***L****earning Strategies of* ***A****dult****S***).

ATLAS consists of five items constructed in a flow-chart design (see Figure 6) and can be completed in approximately one to three minutes (Conti, in press). By responding to two or three of the items, learners can identify their preferred learning

strategy. Each item begins with a stem sentence that directs the learner to two options. Each option leads the learner to either: (a) instructions to proceed to the next item, or (b) to information about the learner's group placement. ATLAS will identify each learner as either a Navigator, Problem Solver or Engager.

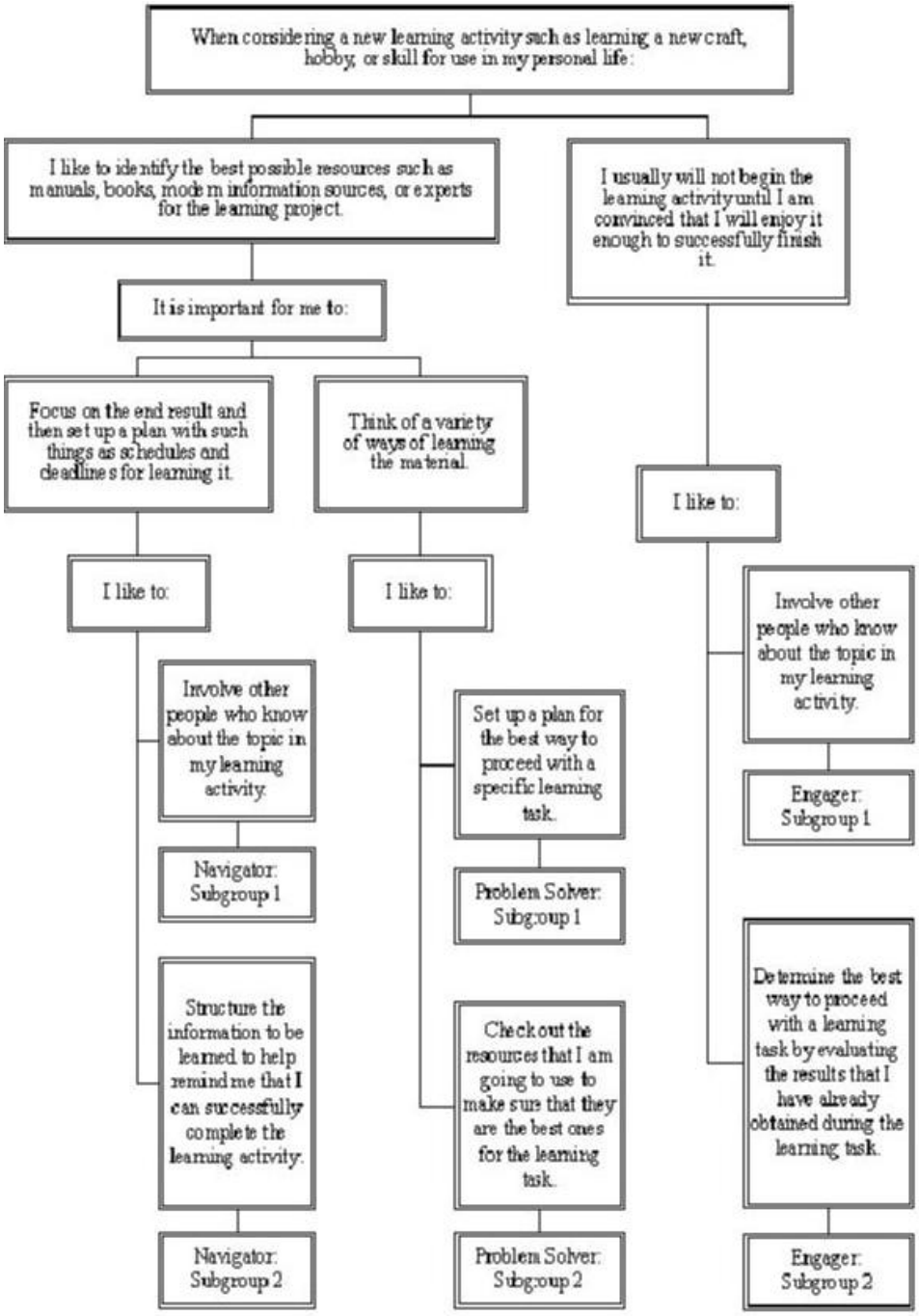

Figure 6. Flow-chart of items in ATLAS. (Source: Conti, in press).

Navigators

Conti and Kolody (1998) described navigators, as measured by ATLAS, as learners who chart a course for learning and then follow that course. According to Conti

(in press) these learners engage in learning activities by looking externally for resources that will aid them in accomplishing the learning task and then, almost immediately, begin to narrow and focus these resources. Learners in this group are always searching for improvement and because of that, every thing in the learning process relates to being efficient and effective:

> Navigators have a demand for order and structure, are logic oriented, are objective, and perfectionists. In learning situations, they like structure and are highly organized, want schedules and deadlines, desire clear learning objectives and expectations, and like summaries and recaps at the end and advanced organizers at the beginning of the learning activity. They use many organizational tools such as colored markers, staples, and binders. They expect and appreciate prompt feedback and will often clarify the details of a learning task several times. Navigators are results oriented and seek logical connections. For them, emotions are not a consideration in learning and liking the teacher and subject are not important. Consequently, they tend not to like group work unless it is led by an expert (Ware, 2005) because they hate slackers and feel that they can often do the work more efficiently by themselves. Navigators put much internal pressure on themselves by seeking perfection, are hyper-critical of errors they make, and often need a period of time to deal effectively with criticisms of their work. (Conti, in press, p. 23)

Problem Solvers

Conti and Kolody (1998) described ATLAS Problem Solvers as learners who rely heavily on all the strategies in the area of critical thinking. According to Conti (in press) these learners engage in learning activities by looking externally at all available resources that will aid them in the completion of the learning task and then, almost immediately, begin to generate additional alternatives based on those resources:

> Problem Solvers are storytellers who elaborate extensively on stories about their experiences because these provide concrete examples for learning. Because they are constantly seeking alternatives, most of their learning activities relate to generating alternatives. Because they are open minded to so many learning possibilities, they often have difficulty making decisions. Consequently, they do not do well on multiple-choice tests because these limit divergent thinking, and Problem Solvers

> procrastinate because it allows thinking to continue. Once they are interrupted in the learning process, they have difficulty in starting it again.
>
> …Problem Solvers view trial-and-error as a process for generating more alternatives. Because they are curious, inventive, and intuitive, learning is an adventure for Problem Solvers and is one they prefer to do in their own way without rigidity or didactic orders. Of the three learning strategy preference groups, the Problem Solvers are the most comfortable dealing with abstract ideas, and they often think in terms of symbols. Problem Solvers are very confident of their own abilities and will often ask questions in class just to help others understand better even if they do not want to know the answer. Problem Solvers are very descriptive and detailed in their answers and insist on using ma[n]y examples to explain an idea. As a result, they are storytellers who enjoy the process of telling the story more than worrying about its completion; although they may seem sometimes to get lost in the details, they will eventually "boomerang" back to the main point of their story. (Conti, in press, p. 24)

Engagers

Conti and Kolody (1998) described ATLAS Engagers as learners who love to learn, learn with feeling and learn best when they are actively engaged in meaningful matter. Conti (in press) stated that these learners engage in learning activities from the affective domain; in other words, before they will become involved in a learning task, they will take some time to contemplate whether or not they will enjoy the learning enough that it is worth their time, effort and energy:

> For Engagers, everything in the learning process relates to building relationships with others. Feelings are the key for the Engagers, and this is reflected in the use of emotional words and terms with feelings such as love and fun. Learning has an aura of excitement for Engagers, and they fully immerse themselves in the learning once they engage in it. They seek and find joy in the learning process and delight in new accomplishments. However, they can get bored quickly. To avoid this, the instructor needs to have them actively engaged in the learning and must remember that Engagers are as interested in the process of learning and the relationships that are built during this process as they are in the academic outcomes of the learning. Unlike Problems Solvers, Engagers are not interested in developing new or abstract ways of doing things; instead, they will often take the path of least resistance to get to a final result or they will utilize shortcuts created by others because these things allow more time and

> energy for concentrating on the dynamics of the learning process. Engagers are excellent networkers who love group work. They tend to develop an emotional affinity with the teacher and have a hard time separating themselves from their work; a positive relationship with the instructor can be catalysis for engagement for them. Because the central feature of learning for Engagers is building relationships, they rely heavily on human resources. (Conti, in press, pp. 25-26)

DiSC Theory and DiSC Classic

The theory of human behavior that was codified in the DiSC instrument was created by William Moulton Marston in 1928 (DISC Profiles, 2002; Inscape Publishing, 1996a; Marston, 1928). In extensive research into human behavior, Marston (1928) found that understanding an individual's perceptions provided a unique and insightful perspective as to how one would respond behaviorally to various situations. Marston wanted to create a way to measure behavior and consciousness energies; the DiSC profile instrument developed from his quest for ways to measure these two types of energies (DISC Profiles, 2002). Marston focused on what he viewed as the "motor self," a muscular predisposition to react to different stimuli in various predictable ways and "motor stimuli," short lasting influences that impact how the motor self responds to various situations (1928). Marston believed that emotions involve an urge to move in a particular fashion; he distinguished emotions from feelings which he viewed as perceptions (Berens, 2001).

From these two points of focus, Marston (1928) created what he called the Emotion Circle (see Figure 7) and proposed two guiding principles:

> (1) Alliance and antagonism of motor stimuli toward the motor self evoke corresponding alliance and antagonism from the motor self. (2) Inferior intensity of volume of the motor stimulus evokes increase of intensity or volume from the motor self and superior volume or intensity of the motor stimulus evokes decrease of intensity or volume from the motor self. (pp. 102-103)

According to Marston (1928) it is easier if one thinks of the relationship between motor self and motor stimulus as a form of mathematical equation where at any given time both sides must be balanced. For example, if value X is subtracted from one side of the equation value X must be added to the other side of the equation to keep it in balanced. When every possible combination of these two sets of variables are combined, the outcome is a continuous series of motor stimuli and a corresponding series of motor self responses, each varying from its predecessor by a noticeable quantitative difference in degree of harmony, and in a degree of intensity difference (Marston, 1928).

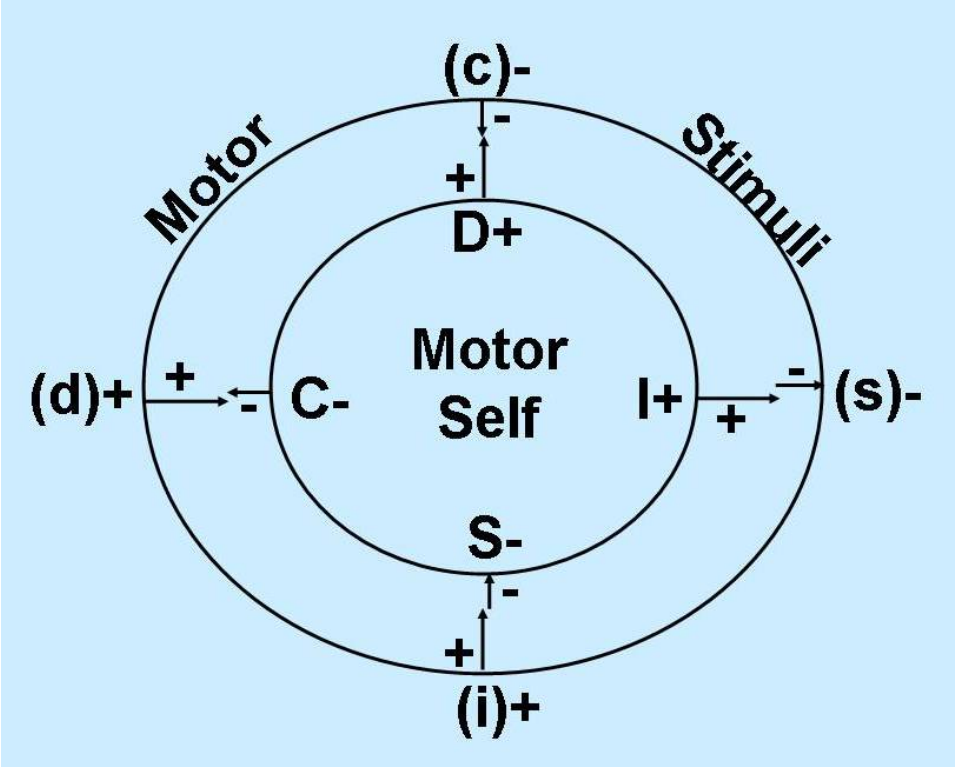

Figure 7. Marston's Emotion Circle. The capital letters D, I, S, C indicate responses of the motor self. A (+) near one of these letters, inside the motor self, indicates an increase of the motor self during response; while a (-) indicates a decrease.

The arrows between the motor self and motor stimuli indicate a relationship between these two elements during response. The length of the arrows indicates predominance of one or the other element (also indicated by a (+) or (-) near the arrow). Arrows pointing in opposite directions indicate antagonism between motor self and motor stimuli; arrows pointing in the same direction indicate alliance.

The small letters (d), (i), (s), and (c) indicate the type of motor stimulus adequate to evoke each response; the motor stimulus (c) being in the same relationship to the motor self as the motor self is to its motor stimulus at C, etc. A (-) near a small letter indicates a decrease of the motor stimulus as a result of the motor self's action upon it; while a (+) indicates an increase. Source: (Marston, 1928).

Marston (1928) summarized the relationships and reactions at each of the primary motor self points as follows:

1. At point D the motor stimulus is antagonistic to the motor self and is inferior in strength in relation to the motor self. The reaction of the

motor self is antagonistic to the motor stimulus and has an increase of strength in relation to the motor stimulus.

2. At point I the motor stimulus is allied with the motor self and is inferior in strength in relation to the motor self. The reaction of the motor self is allied with the motor stimulus and has an increase of strength in relation to the motor stimulus.
3. At point S the motor stimulus is allied with the motor self and has superior strength in relation to the motor self. The reaction of the motor self is allied with the motor stimulus and has a decrease in strength in relation to the motor stimulus.
4. At point C the motor stimulus is antagonistic to the motor self and has superior strength in relation to the motor self. The reaction of the motor self is antagonistic to the motor stimulus and has a decrease of strength in relation to the motor stimulus.

The identifiers Marston (1928) selected were based on three criteria:

1. The lay meaning of the word had to describe with great accuracy the objective relationship between the motor self and motor stimulus.
2. The name selected had to represent the experience in question, as observed introspectively in everyday life.
3. The advantage of new terms not already weighted with dissimilar affective meaning of literary origin.

DiSC Personal Profile System Development

The *DiSC Personal Profile System* (DPPS), is based on Marston's two-axis, four-dimensional model; the model separates behavior into four dimensions: Dominance, influence (known as inducement in Marston's model), Steadiness (known as submission in Marston's model), and Conscientiousness (known as compliance in Marston's model) (DISC Profiles, 2002; Inscape Publishing, 1996a; Marston, 1928). Although Marston developed the descriptive categories and devised a structure to understand and describe human behavior, Marston himself did not develop the DiSC assessment nor did he ever use it (DISC Profiles, 2002; Inscape Publishing, 1996a).

In 1972 John Geier at the University of Minnesota took Marston's initial work and developed the DiSC instrument (Berens, 2001). Geier was interested in researching traits and clusters of traits that would aid researchers and scientists in understanding how people behave in society. Geier interpreted Marston's work by using trait clusters to identify surface traits which can be analyzed and appear to have some type of underlying unity (2001). This original DiSC instrument consisted of twenty-four sets of four words constructed with words used by Marston (Inscape Publishing, 1996a). Each of the terms was included on the basis of consistency with Marston's original model, each set of four words contained one term that was believed to be related to each of the four dimensions and the words were presented in a forced-choice format, i.e. "most like me" and "least like me" (1996a).

In 1994, Inscape Publishing began an extensive two-part research project. Part one consisted of an extensive literature survey, and part two consisted of a stratified random sample of the U.S. workforce which would provide the data to revise, re-norm,

and re-validate the DiSC instrument (Inscape Publishing, 1996a). The DPPS was evaluated to ascertain what, if any, changes were needed to make the DiSC assessment more contemporary and what could be done to increase the reliability of the instrument. Information from customers, distributors and staff was reviewed and incorporated into the analysis instrument and a Delphi process was used to identify and evaluate new items for the DPPS (1996a). The result of this project was the *DiSC Personal Profile System 2800 Series* which was now more contemporary and incorporated more than 40 changes including: word changes; changes in word groups; and the addition of four new response groups, which research indicated improved the reliability of the instrument (1996a).

Personality Traits

It is generally accepted that people are different in numerous ways and that a useful and systematic way to determine consistency and predictability of an individual's behavior is desirable. One way of achieving this is through observation of two types of personality traits. The first types of traits are *source traits* which are internal characteristics that supposedly dictate one's behaviors (Meehl, 2006). In the 1940s Raymond Cattell conducted research which began with 171 trait elements. From these trait elements Cattell was able to identify 16 source traits (Conn & Rieke, 1994). This list of traits includes: Warmth, Reasoning, Emotional Stability, Liveliness, Dominance, Rule-Consciousness, Social Boldness, Sensitivity, Vigilance, Abstractedness, Privateness, Apprehension, Openness to Change, Self-Reliance, Perfectionism, and Tension (1994). The second types of traits, known as *surface traits*, are behaviors one can observe and label (2006). The Global Factors, surface traits, were later derived from Cattell's original work (1994). This list of traits includes: Extraversion, Anxiety, Tough-Mindedness,

Independence, and Self-Control (1994). In other words, surface traits describe observable behaviors, whereas source traits can only be inferred from surface traits and are most commonly used to *explain* one's behavior (Inscape Publishing, 1996b). As a visual representation, one can think of Source and Surface Traits in terms of an iceberg (see Figure 8). The general Iceberg Theory of human behavior states that 90% of the behavior iceberg, Source Traits, is below the water line and unseen to the observer, and only 10% of the iceberg, Surface Traits, is above the water line and visible to the observer .

Figure 8. Visual representation of observable Surface Traits and unobservable Source Traits. This visual has been adapted from several sources and the researcher constructed this visual to represent that which is observable (Surface Traits) and that which is unobservable (Source Traits).

The developers of the DiSC profile instrument assert that when personality measurement focuses on surface traits, it is adequate to establish a general understanding of what the trait represents and to measure the traits appropriately (1996b). When

personality measurements focus on source traits, a substantial body of research must be amassed and surface, or face validity, is simply not adequate enough to justify them (1996b). When an individual is interpreting the D, I, S, and C values it is important to remember that the instrument was created as a means to describe behavior manifestations of personality (surface traits), not to explain emotions (source traits).

Some of the confusion around surface traits and source traits may be because the initial Marston theory was created to explain emotions (Inscape Publishing, 1996b; Marston, 1928), not personality. Personality can be defined as one's "enduring, persistent response patterns across a variety of situations" (Inscape Publishing, 1996b, p. 10), which are comprised of various tendencies, motivation, attitudes, and beliefs all combined in some pattern to establish a self-concept (Rorer, 1992). In contrast, emotions can be defined as a complex state involving physical changes, psychological excitement and generally an impulse toward behavior (Smith & Lazarus, 1992). In applying the information obtained from utilizing the DiSC assessment, users have most often interpreted it as a measure of behavioral personality, not emotion (1996b).

Personality Prototypes

Even in its current form, the DiSC assessment uses some words that are more closely aligned with emotional descriptives than personality descriptives (Inscape Publishing, 1996b). However, 27 of the 112 words (23%) on the DiSC assessment are also part of a core list of words used to research the "Big Five" factors of personality prototypes (John, 1992), previously referred to as Surface Traits. Before examining how DiSC and its four categories align with the Big Five, one general difference needs to be

noted: the DiSC word list contains words that most people view as positive (1996b), whereas the Big Five contains both positive and negative words.

The first factor of the Big Five examines Extraversion; other assessments also use Assertiveness, Gregariousness, or Power (1992). The DiSC assessment items for this factor include: talkative (i), assertive (D), outgoing (i), outspoken (D), dominant (D), forceful (D), enthusiastic (i), sociable (i), and adventurous (D) (1996b). The second factor of the Big Five examines Agreeableness; other assessments refer to it as Social Adaptability, Likeability, Independence, or Love (1992). The DiSC assessment items for this factor include: sympathetic (S), kind (S), generous (S), helpful (S), good-natured (S), friendly (i), cooperative (S), and gentle (S) (1996b). According to John (1992), the factors of Extraversion and Agreeableness account for most of the measured differences between people. This means that these two factors are the most recognizable and used to distinguish one person from another.

Factor three of the Big Five addresses Conscientiousness, sometimes referred to as Self-Control. In the Big Five this factor addresses traits like conscientiousness, reliability, and responsibility from a specific perspective, that of work or employment, whereas the DiSC assessment measures thoroughness (C), conscientiousness (C), cautiousness (C), and precision (C) from a broader perspective of general honesty and trustworthiness (1996b). Factor four of the Big Five addresses Emotional Stability or Anxiety. This factor only contains two items from the DiSC assessment: calm (S), and contented (S) (1996b). According to the instrument representatives (1996b), the reason for lack of DiSC items in this factor is because this factor tends to measure items that are generally described as neurosis items, and, as stated earlier, the DiSC assessment

contains words that people view as positive. The final factor is often labeled Intellect, Culture, Flexibility, Tough Mindedness and Openness to Experience. This factor is meant to assess an individual's willingness to learn (1992). Although it does not appear that the DiSC assessment specifically addresses this area, there are three items, original (D), insightful (C), and logical (C), that do appear on the Big Five factor list (1996b).

The DiSC assessment has much in common with the personality measurements as outlined by the Big Five, specifically in Factors I (Extraversion), II (Agreeableness) and III (Conscientiousness), which account for most of the observed surface trait variation among individuals (1996b). Beyond that, DiSC also possesses features which are not associated with the Big Five:

1. The separation of Factor I (Extraversion) into Dominance and Influence.
2. The combination of Steadiness items with Agreeableness on the S scale.
3. The inclusion of thinking items on the C scale.

DiSC Graphs

The DiSC assessment uses three different types of graphs to provide the user with insightful behavior and personality information. Graph I plots the responses (i.e. words) the user indicted were most like self; Graph II plots the responses the user indicated were least like self; while Graph III plots the differences in Graphs I and II (Inscape Publishing, 2001). Given the generic titles of these graphs, there has been much speculation over the years as to what each graph is describing. Some hold to the theory that Graph I is the public self, Graph II is the private self and Graph III is the real self (Inscape Publishing, 2005a). Others agree that Graph III is the real self; however, assert that Graph I reflects the ideal self, while Graph II reveals less than desirable

characteristics (2005a). Yet another perspective is that Graphs I and II are simply a means to an end, the creation of Graph III, and should be ignored (2005a).

In attempt to resolve these controversies, Inscape Publishing began two massive research projects related to the DiSC in 1994. The first project was designed to review all of Marston's work in relation to this topic. As it was discovered, study of this difference between personal and public self comprised the vast majority of Marston's work. Marston's emphasis on the distinction between public and private self may have led some researchers to believe that was the intent or focus of his theory; it may also explain why some have found the topics of public self versus private self so interesting as a way to expose deeper insights to DiSC users (Inscape Publishing, 2005a).

The second project involved initiating two studies to explore this topic. Study one examined the possibility that Graph I measured the public self, and study two examined the possibility that Graph II measured the private self. Based on the findings of these two studies, there were no findings that supported either of these interpretations for Graphs I and II (Inscape Publishing, 2005a).The findings suggested that in all likelihood, the graphs reflected a set of emotions and behaviors that were in agreement with individuals' over-all, general self-concept (2005a).

Nonetheless, Inscape Publishing (2005a) claimed that researchers and users currently know three things:

1. Marston did not design a theory, or an instrument for that matter, specifically to measure either private or public self-perceptions.
2. Currently, there is not any well-documented support that any of the graphs are indicators of anything other than measurements of general self-concept.

3. Until new research suggests otherwise, Graph III remains the most accurate indicator of user behavior in the DiSC model.

Dominance

This DiSC dimension focuses on shaping the environment by overcoming opposition to accomplish results. People who score high in the intensity of the D or Dominance dimension are very active in dealing with problems and challenges, while those who score lower in this dimension want to do more investigating before making a commitment. High D individuals may commonly be described as demanding, forceful, egocentric, strong willed, driving, determined, ambitious, aggressive and pioneering, while those with lower scores may be described as conservative, low keyed, cooperative, calculating, undemanding, cautious, mild, agreeable, modest and peaceful (DISC Profiles, 2002). Inscape (2001) provides four broad descriptions of individuals in the Dominance dimension:

1. Tendencies include – getting immediate results, causing action, accepting challenges, making quick decisions, questioning the status quo, taking authority, managing trouble, and solving problems
2. Desires an environment that includes – power and authority, prestige and challenge, opportunities for individual accomplishments, wide scope of operations, direct answers, opportunities for advancement, freedom from controls and supervisions, and many new and varied activities
3. Needs to be around others who – weigh pros and cons, calculate risks, use caution, create a predictable environment, research facts, deliberate before deciding, and recognize the needs of others
4. To be more effective, the person needs to – receive difficult assignments, understand that they need people, base techniques on practical experience, receive an occasional shock, identify with a group, verbalize reasons for conclusions, be aware of existing sanctions, and pace self and to relax more (p. 7)

Influence

This DiSC dimension focuses on shaping the environment by influencing or persuading others. People who score high in the intensity of the I or Influence dimension influence others through talking and activity and tend to be somewhat emotional, while those with lower scores influence more by data and facts, and not with feelings. High I individuals may commonly be described as convincing, magnetic, political, enthusiastic, persuasive, warm, demonstrative, trusting and optimistic, while those with lower scores may be described as reflective, factual, calculating, skeptical, logical, suspicious, matter of fact, pessimistic, and critical (DISC Profiles, 2002). Inscape (2001) provides four broad descriptions of individuals in the Influence dimension:

1. Tendencies include – contacting people, making a favorable impression, being articulate, creating a motivating environment, generating enthusiasm, entertaining people, viewing people and situations with optimism, and participating in a group
2. Desires an environment that includes – popularity, social recognition, public recognition of ability, freedom of expression, group activities outside of job, democratic relationships, freedom from control and detail, opportunities to verbalize proposals, coaching and counseling, and favorable working conditions
3. Needs to be around others who – concentrate on the task, seek facts, speak directly, respect sincerity, develop systematic approaches, prefer to deal with things instead of people, take a logical approach, and demonstrate individual follow-through
4. To be more effective, the person needs to – control time, if D or S is low, make objective decisions, use hands-on management, be more realistic when appraising others, make priorities and deadlines, and be more firm with others, if D is low (p.7)

Steadiness

This DiSC dimension focuses on cooperating with others within existing circumstances to carry out the task. People who score high in the intensity of the S or Steadiness dimension want a steady pace, security, and do not like sudden change, while

those who score lower like change and variety. High S individuals may commonly be described as calm, relaxed, patient, possessive, predictable, deliberate, stable, consistent and tend to be unemotional and poker faced, while those with lower scores may be described as restless, demonstrative, impatient, eager, or impulsive (DISC Profiles, 2002). Inscape (2001) provides four broad descriptions of individuals in the Steadiness dimension:

1. Tendencies include – performing in a consistent and predictable manner, demonstrating patience, developing specialized skills, helping others, showing loyalty, being a good listener, calming excited people, and creating a stable/harmonious work environment
2. Desires an environment that includes – maintenance of the status quo unless given reasons for change, predictable routines, credit for work accomplished, minimal work infringement on home life, sincere appreciation, identification with a group, standard operating procedures, and minimal conflict
3. Needs to be around others who – react quickly to unexpected change, stretch toward the challenges of accepted tasks, become involved in more than one thing, are self-promoting, apply pressure on others, work comfortably in an unpredictable environment, help to prioritize work, and are flexible in work procedures
4. To be more effective, the person needs to – be conditioned prior to change, validate self-worth, know how personal effort contributes to the group effort, have colleagues of similar competence and sincerity, know task guidelines, and have creativity encouraged (p. 7)

Conscientiousness

This DiSC dimension focuses on cooperating with others within existing circumstances to ensure quality and accuracy. People who score high in the intensity of the C or Conscientiousness dimension adhere to rules and regulations, like structure, like to do quality work and like to do it right the first time, while those who score lower like to challenge the rules, and want independence. High C individuals may commonly be described as careful, cautious, exacting, neat, systematic, diplomatic, accurate and tactful, while those who score lower may be described as self-willed, stubborn, opinionated,

unsystematic, arbitrary, and careless with details (DISC Profiles, 2002). Inscape (2001) provides four broad descriptions of individuals in the Conscientiousness dimension:

1. Tendencies include –adhering to key directives and standards, concentrating on key details, thinking analytically/weighing the pros and cons, being diplomatic with people, using subtle or indirect approaches to conflict, checking for accuracy, analyzing performance critically, and using a systematic approach to situations or activities
2. Desires an environment that includes – clearly defined performance expectations, values of quality and accuracy, reserved and business like atmosphere, opportunities to demonstrate expertise, control over factors that affect their performance, opportunities to ask "why" questions, and recognition for specific skills and accomplishments
3. Needs to be around others who – delegate important tasks, make quick decisions, use policies only as guidelines, compromise with the opposition, state unpopular positions, initiate and facilitate discussions and encourage teamwork
4. To be more effective, the person needs to – have time to plan carefully, know exact job descriptions and performance objectives, schedule performance appraisals, receive specific feedback on performance, respect people's personal worth as much as their accomplishments, and develop tolerance for conflict (p.7)

Classical Profile Patterns

Behavioral patterns, determined by the shape of one's DiSC profile graph, provide an integrated interpretation of the user's behavioral style by combining the four DiSC dimensions. Each DiSC Classical Profile Pattern describes the behavior of individuals with a specific blend of the four DiSC behavioral dimensions (Inscape Publishing, 2001). In total, there are 18 patterns presented with the DiSC documentation. Three of the 15, Undershift, Overshift, and Tight, are used to identify potential errors an individual may have made. The remaining 15 Classical Profile Patterns describe the complexity and subtlety of behavior. In each of the 15 patterns, insights into work behavior are summarized in nine key areas (2001):

1. Emotions, which examines an individual's general emotional demeanor.

2. Goals, which describe what one is most motivated to obtain.
3. Judges Others By, or the basis on which one person evaluates another person.
4. Influences Others By, which examines how one can affect the behavior of others.
5. Value to the Organization, which describes how one contributes to an organization.
6. Overuses, which explores how one's strengths can become limitations.
7. Under Pressure, this illustrates how one reacts to stressful situations.
8. Fears, this area describes what causes one discomfort.
9. Would Increase Effectiveness Through, provides a guideline to follow for achieving maximum success.

Full descriptions of each DiSC Classical Profile Pattern are located in Appendix A.

CHAPTER 3

METHODOLOGY

Design and Approach

This study utilized descriptive research methodology which determines and describes the way things exist (Fraenkel & Wallen, 2003; Gay & Airasian, 2000). In educational research, the most commonly used descriptive methodology is the questionnaire (Fraenkel & Wallen, 2003) where studies are designed to gather information about the abilities, preferences, behaviors, practices, concerns or interests of a particular group of individuals (Gay & Airasian, 2000). In this type of study it is common for the researcher to collect data from surveys or questionnaires that are self-administered by the participants (Gay & Airasian, 2000). This study used questionnaire data from participants who completed a behavior style assessment and a preferred learning strategy assessment as well as demographic data.

Quantitative data was collected from the *DiSC Classic Personal Profile System 2800 Series* (DiSC) instrument and the ***A****ssessing* ***T****he* ***L****earning Strategies of* ***A****dult****S*** (ATLAS) instrument. These data, along with the demographic variables of age, gender, ethnicity, level of management, education, and industry, were used to describe the behavior and learning strategy preferences of the sample. All data were based on self-assessment in a volunteer sample.

Population and Sample

A population "is the group of interest to the researcher, the group to whom the researcher would like to generalize the results of the study" (Fraenkel & Wallen, 2003, p. 97). The population of interest for this study was individuals (associates) working in industrial or corporate organizations in the Oklahoma City, OK, with no preference given to management or non-management level associates.

A sample refers to a subset of the desired population from which information is collected (Fraenkel & Wallen, 2003; Gay & Airasian, 2000). "The "goodness" of the sample determines the meaningfulness and generalizability of the results… a good sample is one that is representative of the population from which it was selected" (Gay & Airasian, 2000, p. 123). In descriptive research the technique of cluster sampling is commonly used to congregate a sample that is representative of the targeted population which, in some cases, may be very large or very geographically disbursed (2000, p. 129). This approach is also more time and cost effective and is generally more convenient for the researcher (2000, p. 129). This was the situation in this study. The researcher gathered information from 124 individuals at industrial or corporate organizations in the Oklahoma City area who had completed a questionnaire that consisted of the *DiSC Personal Profile System 2800 Series,* ATLAS (***A****ssessing* ***T****he* ***L****earning Strategies of* ***A****dult****S***) and demographic information. The researcher gathered information from individuals at three Oklahoma City businesses. These businesses were selected because: (a) the researcher had connections within each organization, (b) the researcher obtained consent from each organization to participate in the study, (c) the organizations represented a mix of organizations, (d) the organizations represented large sectors of Oklahoma City and

Oklahoma industry, and (e) The researcher has a working knowledge of each industry; he has worked in the financial industry for 13 years, he worked for Cox Communications Inc. for 3 years, and he currently works for Great Plains Coca-Cola Bottling Company.

The researcher also attempted to obtain consent from two public and one private oil and gas companies because of this industry's prominence in Oklahoma. However, none were willing to participate in the study. During May of 2008 the researcher met with the participating organizations to collect data from their associates as described in the Procedures section of this chapter.

Profiles of Companies in Sample

American-Fidelity Assurance Group

American-Fidelity Assurance Group associates account for 43 of the 124 participants in this study. Founded in 1960 on the principles of fairness and financial security, American-Fidelity Assurance Group has achieved unparalleled success as one of the largest private, family-owned life insurance companies in the nation. American-Fidelity Assurance Group is a unique, family-owned organization providing insurance products and financial services to education employees, trade association members and companies throughout the United States and across the globe. The Oklahoma City-based company employs over 1,400 associates and serves more than one million customers in 49 states and 20 countries.

American-Fidelity Assurance Group has been ranked among Fortune magazine's 100 best companies to work for in the United States each year since 2004, and has been the highest ranked insurance company on the list all four years. Since 1982, American-Fidelity Assurance Group has consistently been rated "A+" by A. M. Best Company

(Best, 2008), one of the leading insurance company rating services in America. American-Fidelity Assurance Group is a unique, family-owned organization providing insurance products and financial services to education employees, trade association members and companies throughout the United States and across the globe.

American-Fidelity Assurance Group was not willing to share any demographic information pertaining to their organization.

Cox Communications Incorporated

Cox Communications Incorporated (CCI) associates account for 50 of the 124 participants in this study. Cox Communications Incorporated is one of the four subsidiaries of Cox Enterprises. Cox Enterprises is the successor company founded by James M. Cox in Dayton Ohio in 1898. Cox Enterprises is a privately held organization with 98% of the company being held by Cox's daughter, Anne Cox Chambers and the two children, James C. Kennedy, Blair Parry-Okedon, of her late sister, Barbara Cox Anthony. James C. Kennedy, Anthony's son, is the current chairman and CEO of the organization. Cox Enterprises is currently headquartered in Atlanta, Georgia and publishes a total of 16 different daily news papers, and 30 non-daily papers. The organization owns 15 television stations, 81 radio stations, and a large cable television enterprise (Cox Communications Incorporated).

Cox Enterprises expanded their footprint into cable television in 1962 by purchasing three cable systems in Pennsylvania followed by systems in California, Oregon and Washington. This subsidiary company, previously known as Cox Broadcasting Corporation, was officially formed in 1964 when it was established as a publicly traded company on the New York Stock Exchange. In 2004, Cox Enterprises

announced its intention to purchase those shares of Cox Communications Incorporated which they did not own; this purchase would take CCI from a publicly traded corporation to a privately held corporation. A $6.6 billion tender offer was completed in December of that year, and Cox Communications Incorporated has been a wholly owned subsidiary since (Farrell, 2005).

Cox Communications Incorporated provides digital cable television and telecommunications services to more than 5.9 million customers, including 2.9M digital cable, 3.5M Internet, and 2.2M digital telephone customers; and employs more than 22,000 associates in 14 states. The Oklahoma market services approximately 550,000 customers in over 100 communities and employs approximately 2,000 associates (Cox, 2008).

In 2007, *Diversity Inc*. magazine named Cox Communications Incorporated number 25 in its Top 50 Companies for Diversity (DiversityInc, 2007), and in Cox climbed to the sixth position on *Diversity Inc's* 2008 list (DiversityInc, 2008a). Also in 2008, Cox was named #8 on the Top 10 Companies for African Americans (DiversityInc, 2008b).

Cox Communications Incorporated was not willing to share any demographic information pertaining to their organization.

Great Plains Coca-Cola Bottling Company

Great Plains Coca-Cola Bottling Company (GPCCBC) associates account for 31 of the 124 participants in this study. Great Plains Coca-Cola Bottling Company is one of the 300 member world-wide bottlers of Coca-Cola (Coca-Cola, 2008b). Each member is a member of the Coca-Cola Bottlers Association which reports to Coca-Cola Enterprises.

Coca-Cola was established in 1886 by pharmacist Dr. John Pemberton (Coca-Cola, 2008b). However, it was not until 1894 when a candy store owner, Joseph A. Biedenharn, in Vicksburg, Mississippi, noticed the rapid sales of the new fountain beverage and began bottling Coca-Cola to sell to his customers (Coca-Cola, 2008a). Today, the Coca-Cola Company, headquartered in Atlanta Georgia, develops products, produces related marketing and advertising programs, and sells syrup concentrate to Coca-Cola Enterprises (CCE, 2008). Coca-Cola Enterprises is the world's largest marketer, producer and distributor of products of The Coca-Cola Company. Coca-Cola Enterprises is an independent, public company traded on the New York Stock Exchange under the stock symbol CCE. The Coca-Cola Company owns approximately 35% of Coca-Cola Enterprises (CCE, 2008).

Currently the Coca-Cola companies employ over 90,000 associates and distributes more than 2,800 products in over 200 countries (Coca-Cola, 2008b). Coca-Cola companies are number one in sales of sparkling beverages, juices and juice drinks, number two in sales of sports drinks, number three in sales of bottled water, and own four of the world’s top five nonalcoholic sparkling beverage brands (Coca-Cola, 2008b). In 2007, *Diversity Inc*. magazine named Coca-Cola number four in its Top 50 Companies for Diversity (DiversityInc, 2007), and in Coca-Cola climbed to number two on *Diversity Inc's* 2008 list (DiversityInc, 2008a).

The Oklahoma City franchise for Coca-Cola was first incorporated in 1903 as the Oklahoma Coca-Cola Bottling Company. In 1922 the Browne Family bought the franchise and began a tradition that has been an important part of Oklahoma for the last 86 years. In 1980, the name of the company was changed to Great Plains Coca-Cola

Bottling Company. Great Plains Coca-Cola Bottling Company is a private, family owned business.

Great Plains Coca-Cola Bottling Company is headquartered in Oklahoma City, Oklahoma and is one of the largest Coca-Cola bottling companies in the United States, distributing Coke products to more than 2.5 million consumers throughout central and northeast Oklahoma and northwest Arkansas (Hoovers, 2008). In 2007, Great Plains Coca-Cola Bottling Company generated more than $281M in sales (Hoovers, 2008), employs 1,500 associates (Staff, 2007) and was named the 2007 bottler of the year by *Beverage World* (Cioletti, 2007).

Great Plains Coca-Cola Bottling Company was not willing to share any demographic information pertaining to their organization.

Instrumentation

The researcher-developed survey instrument for this study consisted of three parts. Part one was a replica of the *DiSC Personal Profile System 2800 Series*. This section of the survey carried all of the validity and reliability associated with the *DiSC Personal Profile 2800 Series* instrument as described below. Part two of the survey was a paper based format of ATLAS (***A****ssessing* ***T****he* ***L****earning Strategies of* ***A****dult****S***). This section of the survey carried all of the validity and reliability associated with the ATLAS instrument as described below. Part three of thee survey consisted of six demographic questions related to age, gender, management level, ethnicity, highest level of education, and industry.

DiSC Personal Profile System 2800 Series

The DiSC assessment is a 19 page instrument that can be used to identify a learner's personality/behavior profile. In this assessment there is a one page response sheet (see Appendix B) containing 28 forced-choice groups of words. Each grouping consists of four words and two columns. For each group of words the learner must choose one of the four words that is Most Like Me (Most) and one of the four words that is Least Like Me (Least). For each grouping of words the learner must indicate only one word for the Most Column and one word for the least column. This will result in the learner choosing a total of 28 words that are Most Like Me (Most) and 28 words that are Least Like Me (Least) for a total of 56 word choices. The remaining 18 pages of the instrument are used by the learner to help interpret the information from output Graphs I, II, and III (see Chapter 2 for information on DiSC graphs).

Once all Most and Least Choices have been made, the learner adds up all of the responses related to the Dominance Most trait, influence Most trait, Steadiness Most trait and Conscientious Most trait. These four numbers will be used by the learner to determine Graph I. The learner repeats this same process for the Least Column. These four numbers will be used by the learner to determine Graph II. Next, the learner nets the Dominance Most number against the Dominance Least number; this will result in the Dominance difference number. The learner repeats this process for the remaining three traits. Once the learner has a value Dominance Difference, influence Difference, Steadiness Difference, and Conscientious Difference the learner then uses these four numbers to determine Graph III. The information from Graph III is the information needed to determine the learner's Classical Profile Pattern (see Appendix A for full description).

The current *DiSC Personal Profile System 2800 Series* (DiSC) assessment was founded on Marston's original work on human behavior from 1928. In this original work, described in Chapter 2, there were 24 groupings of words with each grouping consisting of four words thought to be related to one of the four categories D, i, S, and C (see Chapter 2 for details). In 1972 the DiSC assessment was validated and normed on 1,000 individuals. This group of individuals was comprised of 752 males and 248 females from the business population. This predominantly Caucasian sample of business people consisted of: 432 executives and supervisors, 183 sales, 55 engineers, 63 applicants, 35 technical, 113 clerical, 43 students, 18 machinists, and 58 miscellaneous (Inscape Publishing, 1996a).

In October of 1993 Inscape Publishing began a three year research agenda to improve the validity and reliability of the original *DiSC Personal Profile System* (Inscape Publishing, 1996a). This initial exploratory research consisting of 3,000 individuals did in fact indicate that the learning instrument did need to be modernized (Inscape Publishing, 1996a). A Delphi process was used to identify and evaluate potential revisions and new items for the *DiSC Personal Profile System*. In order to determine the viability of the changes to the instrument Inscape Publishing used a random sample stratified on several key variables to match the general U.S. workforce population. Specifically, the researchers designed a study that matched the educational level, ethnicity, age, and gender characteristics of the U.S. workforce (Inscape Publishing, 1996a). To support this stratified random sample, the researchers looked for a variety of job categories, levels and industries across five geographic locations: Atlanta, Georgia; Boston, Massachusetts; Houston, Texas; Irvine-Los Angeles, California; and Minneapolis, Minnesota (Inscape

Publishing, 1996a). The researchers did not report encountering any unusual circumstances during this process. This research produced two key results. First it was determined that the original forced-choice format of the assessment was the best method of administering the assessment because it provided consistency; participants could only select from one of the four options, there was no option to write in any different responses that would complicate analysis (Inscape Publishing, 1996a). Second, four new questions were added to the new assessment currently known as the *DiSC Personal Profile System 2800 Series*, which was launched in 1994 (Inscape Publishing, 1996a).

From its launch in 1994 to 1996, Inscape Publishing collected and analyzed *DiSC Personal Profile System 2800 Series* data on an additional 812 individuals. Of this sample, 45% were male and 55% were female; 28% had a high school education or less, 27% had some post-secondary education, 30% had graduated college and 15% had obtained at graduate or professional degree (Inscape Publishing, 1996a). The ethnic breakdown consisted of: 10% African-American, 2% Asian, 80% Caucasian, 5% Hispanic, 2% Native American and 2% who responded Other (1996a). This sample from the general U.S. workforce consisted of individuals employed in the areas of: general clerical 8%, secretarial or administrative 7%, sales 7%, technical 6%, warehouse or general labor 6%, supervisory 6%, mid-level management 10%, executive 4%, professional 25%, and other 22% (1996a). The research did not provide any operational definitions as to the distinct differences of what constituted a supervisory, mid-level management, or executive position. Because the original sample had been so carefully drawn, researchers wondered if the addition of almost twice as many respondents would significantly change the distribution of scores (results) obtained from the original

development of the *DiSC Personal Profile System 2800 Series* (1996a). While the distribution of scores did change, the distribution changed only slightly, the changes were positive, and the change in the distribution of the scores provided for a more normal, bell shaped curve (Inscape Publishing, 1996a).

Construct validity. This is the most important form of validity because it addresses the most fundamental question of validity: What is the instrument really measuring (Gay & Airasian, 2000)? Constructs are non-observable traits like intelligence, honesty, trustworthiness, and patience that attempt to explain a person's behavior (Fraenkel & Wallen, 2003; Gay & Airasian, 2000). Inscape Publishing (2005b) provided an example using the D scale (see Chapter 2 for scale descriptions) from the *DiSC Personal Profile System 2800 Series*. This construct measures the construct of dominance. This construct is theoretically associated with various other constructs. For example, it is reasonable to assume that a person who is extremely dominant will be rated as highly aggressive by their peers. Thus, dominance and a peer rating of aggressiveness are theoretically related. Inscape Publishing used three tests to determine construct validity: Scale Intercorrelations, Multidimensional Scaling, and Factor Analysis.

Scale Intercorrelations examine the validity of a learning instrument as a whole. Learning instruments such as DiSC posit an underlying model in which the various scales are thought to have a specific relationship to each other. The DiSC model proposed that adjacent scales (D/i, i/S, S/C, and C/D) will have weak to average correlations (Inscape Publishing, 2005b). Table 14 illustrates the data gathered from 7, 038 individuals in 2002 who completed the *DiSC Personal Profile System 2800 Series*. The individual DiSC scales supported this model that weaker correlations were noticed between adjacent

scales and that stronger negative correlations were noticed between scales diagonally across from each other (C and i, and D and S) (2005b).

Table 14. Scale Intercorrelations among the DiSC scales

	D	i	S	C
D	0.87			
i	-0.11	0.81		
S	-0.82	-0.22	0.82	
C	-0.37	-0.71	0.30	0.77

Note. Cronbach's Alpha reliabilities are shown in the shaded area along the diagonal, with the correlation coefficients among the scales listed within the body of the figure. (Source: Inscape Publishing, 2005b).

The second statistical technique that added construct support to the *DiSC Personal Profile System 2800 Series* was Multidimensional Scaling. This technique provided two primary advantages to the researchers. First it allowed for a visual inspection of the relationships among the four scales and second it allowed the researchers to look at all of the scales concurrently (Inscape Publishing, 2005b). The sample size for this test consisted of 45,588 individuals who had taken the online version of the *DiSC Personal Profile System 2800 Series* (2005b). Figure 9 illustrates scales that are closer have a stronger positive relationship, while scales that are farther part have a stronger negative relationship (2005b). Like the test of Scale Intercorrelations, the scales that are closer are adjacent to each other while the scales farther apart are diagonal from each other.

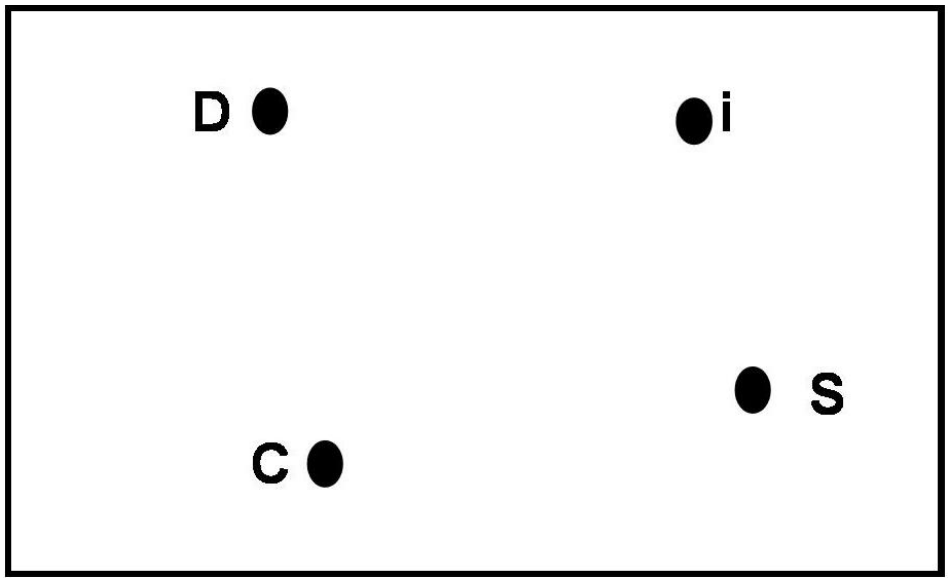

Figure 9.Multidimensional Scaling among the DiSC scales. (Source: (Inscape Publishing, 2005b).

The third statistical technique used for construct validation was factor analysis. Factor analysis, unlike the previous two statistical techniques, was used to examine and describe the *DiSC Personal Profile System 2800 Series* on the level of items, not the level of scales (Inscape Publishing, 2005b). This technique assisted the researchers in understanding which items were highly correlated and subsequently grouped together to form a scale.

The DiSC model proposed that there were two primary factors, motor self and motor stimuli (see Chapter 2), underlying the four scales. If this model was adequately measured by the *DiSC Personal Profile System 2800 Series*, then items on the i and C scales should be highly correlated on one factor and items on the D and S scales should be highly correlated on the second factor (Inscape Publishing, 2005b). Data from 7,038 individuals were used to calculate this factor analysis and the results demonstrated that for each of the *DiSC Personal Profile System 2800 Series* scales, items did in fact group together and load onto factors in the expected manner (2005b). These results supported

the premise of the DiSC model and the appropriateness of the *DiSC Personal Profile System 2800 Series* items to measure the model (2005b).

Content validity. Content validity can be measured using Cronbach's Alpha to determine the degree of internal consistency validity of an instrument. Cronbach's Alpha measures the degree of correlation of a group of items, with range from -1.00 to +1.00 (Fraenkel & Wallen, 2003). If the alpha value is closer to -1.00 there is a negative correlation between the items, meaning that as one value increases or decreases another value increases or decreases in the opposition direction. If the alpha value is closer to 0.00 there is no correlation among the items in question, meaning that a change in one item has no impact on another item. If the alpha value is closer to +1.00 there is a positive correlation between the items, meaning that as one value increases or decreases another value increases or decreases in the same direction. Cronbach's Alpha was calculated separately for each of the DiSC scales and, as indicated in Table 14 above, the DiSC Personal Profile System 2800 Series has good-to-excellent internal consistency (Inscape Publishing, 2005b).

Criterion related validity. Criterion related validity is used to examine the relationship of one instrument to another type of instrument. Basically, the researchers at Inscape Publishing looked for other learning instruments that measured the same constructs that the *DiSC Personal Profile System 2800 Series* measured. For example, the Influence (i) scale of DiSC is theoretically related to the construct of extraversion; therefore the Influence scale should correlate highly with the scales on other instruments that also measure extraversion (Inscape Publishing, 2005b). The researchers at Inscape Publishing used Raymond Cattell's *16 Personality Factor Questionnaire* (16PF) and the

Myers-Briggs Type Indicator (MBTI) as comparison instruments for the *DiSC Personal Profile System 2800 Series.*

Cattell developed the 16PF in the 1940s (Conn & Rieke, 1994). This instrument professed to assess 16 factors, or traits, which represent the major differentiations in individual personality (1994). For DiSC validation purposes, the researchers at Inscape Publishing were only interested in those scales that were theoretically related to the constructs measured by the DiSC model (Inscape Publishing, 2005b). The researchers at Inscape Publishing (2005b) asked 103 individuals to take both the 16PF and the DiSC (the DiSC instrument used in this research was the predecessor to the current *DiSC Personal Profile System 2800 Series*) and the results were as follows. First, the Dominance scale of the 16PF should be positively correlated with the DiSC D scale and negatively correlated to the DiSC S scale. The analysis confirmed that the Dominance scale of the 16PF was strongly and positively correlated to the DiSC D scale (r = .62) and strongly and negatively correlated to the DiSC S scale (r = -.52) (2005b). Second, the Liveliness Scale of the 16PF should be positively correlated with the DiSC i scale. Data supported this hypothesis and indicated a strong positive relationship between these two scales (r = .61). The Liveliness scale also demonstrated a moderate negative correlation with the DiSC C scale, (r = -.45) which fit the DiSC construct model (2005b).

Third, the Sensitivity scale of the16PF measured people on a continuum that ranged from tough-minded on the low end to tender-minded on the high end. This construct is indirectly addressed in both the D and S scales of DiSC. The scale of Sensitivity should reflect a moderately negative correlation with the DiSC D scale and a moderately positive correlation with the DiSC S scale. The data supported this

hypothesis: the D scale relationship was as predicted and statistically significant while the S relationship was as predicted although not statistically significant (Inscape Publishing, 2005b). The fourth 16PF measurement scale was the Rule Consciousness scale. This scale measured individuals from self-indulgent and rule-disregard on the low end to dutiful and rule-conscious on the high end. This construct was individually assessed by the DiSC C scale; therefore it was expected that the correlation would be moderately positive between these two scales. The data indicated a statistically significant positive relationship between the two scales (2005b).

The fifth 16PF measurement was Social Boldness scale. This scale measured individuals on a continuum that ranged from shy and threat-sensitive on the low end to bold and adventurous on the high end. Theoretically, this measurement should have moderately correlated to each of the four DiSC scales; the S and C scales should have indicated a moderately negative relationship while the D and i scales should have indicated a moderately positive relationship. The data supported three of the four hypothesized correlations. The D, S and i scales all produced statistically significant results that supported their respective hypothesized correlations. While the D scale did produce results that supported the hypothesis, the correlation was much smaller than hypothesized (Inscape Publishing, 2005b). The final 16PF scale used in this comparison test was the Privateness scale. This scale measured people on a continuum that ranged from forthright and open on the low end to discreet and non-disclosing on the high end. This construct is indirectly addressed in both the i and C scales of DiSC. It was expected that the DiSC i scale would have a moderately negative correlation and the DiSC C scale

would have moderately positive correlation. The data supported these hypothesis with both being statistically significant (2005b).

The second instrument used to examine the construct validity of DiSC was the *Myers-Briggs Type Indicator* (MBTI). The MBTI is a personality inventory based on the works of Carl Jung (Inscape Publishing, 2005b; Keirsey, 1998, 2007). This instrument was supposed to measure a person's personal preferences on the four scales of Introversion/Extraversion, Sensing/Intuition, Thinking/Feeling and Judging/Perceiving (Inscape Publishing, 2005b; Keirsey, 1998, 2007). Only the MBTI scale of Introversion/Extraversion was hypothesized to have a strong relationship with the four scales associated with the DiSC model, while the MBTI scale of Thinking/Feeling was hypothesized to have a moderate or weak relationship with the four DiSC scales (Inscape Publishing, 2005b).

The researchers at Inscape Publishing (2005b) asked 103 individuals to take both the MBTI and the DiSC (the DiSC instrument used in this research was the predecessor to the current *DiSC Personal Profile System 2800 Series*) and the results were as follows. First, the Introversion/Extraversion scale proposed to measure the source of an individual's personal energy. Introverts, those who scored lower on this scale, were thought to produce their energy from inward reflection. Individuals who had low scores on this scale were described as contained, reflective or quiet; these same adjectives were used to describe those who scored high on the DiSC C scale and consequently a negative correlation should exist between these two scales (2005b). The other group, Extraverts, those who scored higher on this scale, was thought to produce their energy from external interaction. Individuals who had high scores on this scare were described as expressive,

gregarious, or enthusiastic; these same adjectives were used to describe those who scored high on the DiSC i scale and consequently a positive correlation should exist between these two scales (2005b). The data did in fact support these two hypotheses. The DiSC i scale correlated strongly and positively (r = .65) and the DiSC C scale correlated negatively (r = -.35). While the C correlation was not as strong, both correlations were statistically significant as well as in the appropriate direction (2005b).

The second MBTI scale, Thinking/Feeling, proposed to measure the method by which a person makes a decision. Thinkers, those who scored lower on the Thinking/Feeling scale, were described as people who made decisions based on objective, logical analysis; these same adjectives were used to describe those who scored high on the DiSC D and C scales, and consequently a weak-to-moderate negative correlation should exist between these two scales (2005b). Feelers, those who scored higher on the Thinking/Feeling scale, were described as people who made decisions based on personal values for the purpose of creating harmony; these same adjectives were used to describe those who were high on the DiSC i and S scales, and consequently a weak-to-moderate positive correlation should exist between these two scales (2005b). The data did in fact generally support these two hypotheses. The DiSC D scale did have a negative correlation, although the C scale had an unexpected slight positive correlation. The DiSC i and S scales did in fact produce the anticipated positive correlations (2005b).

Reliability. From the data collected between 1994 and 1996 research it was concluded that the *DiSC Personal Profile System 2800 Series* (28 box) was considerably more reliable than the original *DiSC Personal Profile System* (24 box). Table 15 illustrates that 24 box to 28 box correlation reliabilities were significantly increased for i

and C scales. Reliability of C-Most (Most Like Me) increased from .36 to .72 and C-Least (Least Like Me) increased from .52 to .74 (Inscape Publishing, 1996a). Additionally, i-Most reliabilities increased from .50 to .79 and i-Least increased from .47 to .74 (1996a). Currently accepted standards require instruments to possess a reliability coefficient at or above .70; Graph III for the DiSC Personal Profile System 2800 Series has reliability ranging from .85 to .92 (1996a).

Table 15. Comparison of the 24 box DiSC to the 28 box DiSC

	28 Box Graph I (Most)	24 Box Graph I (Most)	28 Box Graph II (Least)	24 Box Graph II (Least)	28 Box Graph III
D	0.85	0.79	0.84	0.76	0.92
i	0.79	0.50	0.74	0.47	0.87
S	0.77	0.61	0.78	0.59	0.88
C	0.72	0.36	0.74	0.52	0.85

Note. There was no information available for Graph III of the 24 box DiSC. (Source: Inscape Publishing 1996a).

ATLAS

A**ssessing **T**he **L**earning Strategies of **A**dult**S (ATLAS) was the second learning instrument used in this research study. ATLAS is a learning instrument that was developed subsequent to the learning instrument *Self-Knowledge Inventory of Lifelong Learning Strategies* (SKILLS). The SKILLS assessment developed by Fellenz and Conti indicated that learning strategies were defined by five primary concepts: metacognition, metamotivation, memory, critical thinking, and resource management (Conti & Fellenz, 1991; Conti & Kolody, 1998, 1999) and that there are very distinct patterns in the learning strategies individuals use when beginning a new learning activity(Conti, in press). The goal of identifying this subsequent instrument (ATLAS) was to create an instrument that was easy to administer, could be completed quickly, and could be used

immediately by both facilitators and learners(Conti, in press; Conti & Kolody, 1998, 1999). Derivation of ATLAS from SKILLS and establishment of validity and reliability are discussed below.

ATLAS consists of five statements and responses in a flow-chart design (see Figure 10). Each statement contains two options from which the learner must choose. Each option guides the learner to either proceed to the next item, or provides the individual with information about the individual's correct learning strategy group placement (Conti, in press). By responding to a few statements, individuals can quickly and easily identify their preferred learning strategy.

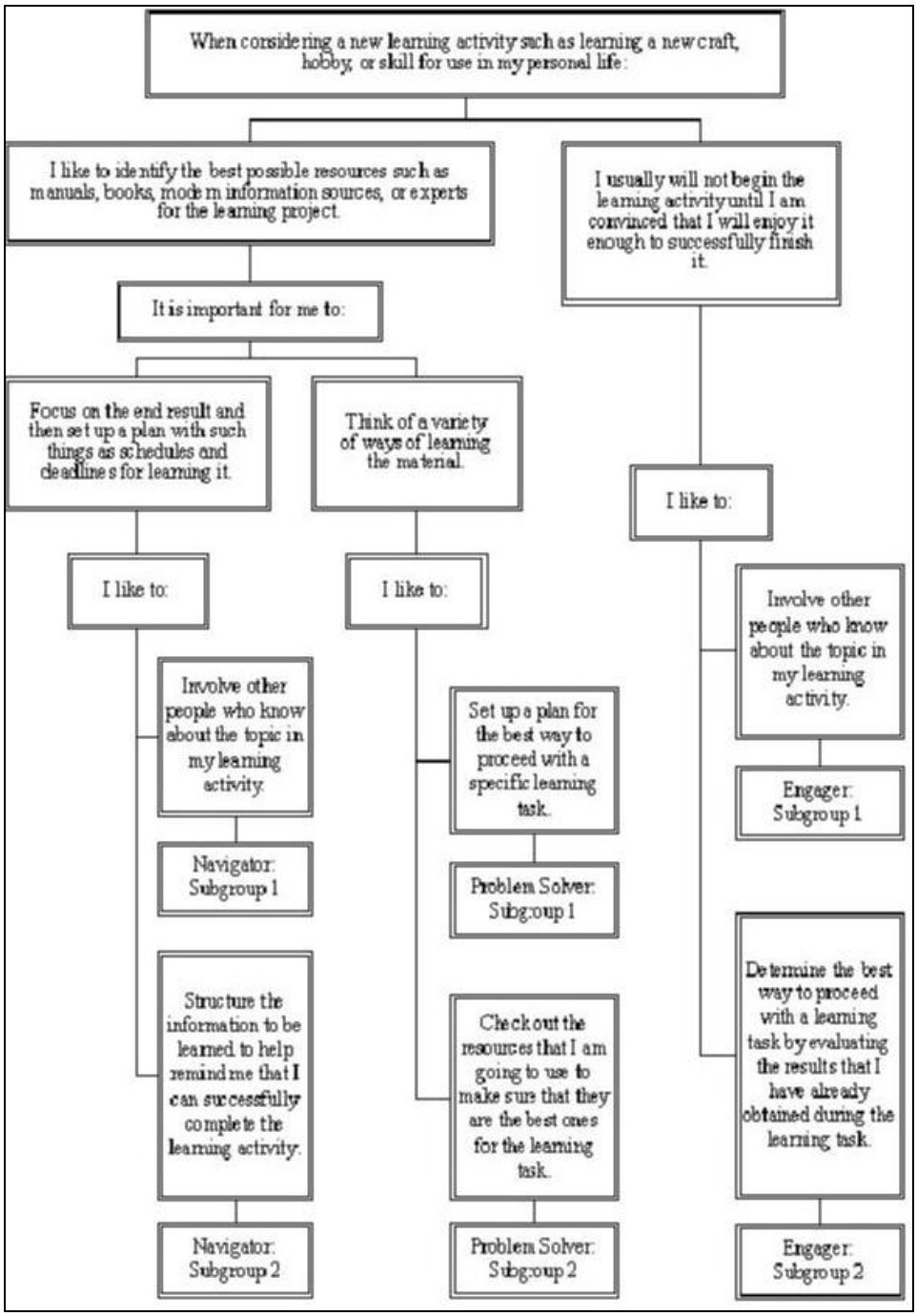

Figure 10. Flow-chart of items in ATLAS. (Source: Conti, in press).

By completing ATLAS, individuals can find out which of ATLAS' three groups, Navigator, Problem Solver, or Engager, most accurately describes their preferred learning strategy (Conti, in press; Conti & Kolody, 1999). Navigators are individuals that prefer a

learning environment which is highly structured with schedules, relevant resources, clearly stated objectives, deadlines, and high levels of relevant feedback. Problem Solvers are highly creative individuals and thus tend to produce multiple alternatives to learning situation. These individuals are flexible and even like uncertainty or vagueness as they progress down their learning path Problem Solvers like to explore all or as many options as possible before setting one option and they may prefer human resources over books, manuals or the Internet. Engagers are individuals who approach learning from the affective domain. Engagers love to learn for the sake of learning; however they will generally not enter into a learning situation unless they know they will be engaged in a meaningful way. Once they do decide to enter into the learning situation they are committed 100% and they will proceed with great excitement. Engagers also like and need personal relationships in learning environments (Conti, in press; Conti & Kolody, 1999).

Since the development of ATLAS, this learning instrument has existed in several different formats ranging from paper versions that are contained on one page, to paper versions which are spiral-bound and printed on multi-colored paper, to an electronic version designed for web-based research studies. Regardless of the format all versions follow the same flow-chart design, may be completed in one to three minutes depending on the individual's reading ability, and have been tested for validity and reliability (Conti, in press).

Construct validity. The construct validity for ATLAS was founded on the same five constructs (metacognition, metamotivation, memory, critical thinking and resource management) and theoretical bases of SKILLS. The developmental researchers analyzed

the literature of studies that used SKILLS in field based research and consolidated the data from many of these studies (Conti, in press; Conti & Kolody, 1998, 1999). The data collected from these field based research studies provided the researchers with data from 3,070 individuals for use in their analysis (Conti, in press; Conti & Kolody, 1998, 1999).

To determine on which variables the data split, the researchers used discriminant analysis. SPSS provided 5-cluster, 4-cluster and 3-cluster solutions. For each analysis, the groups were the groups identified by SPSS, and the discriminating variables were the 60 items of the SKILLS learning instrument (Conti, in press). While there were many similarities in the outputs for each analysis, the discriminant functions produced by each differed greatly in their ability to place individuals into the correct learning strategy group (Conti, in press). The SPSS outputs indicated the following correct placements for each group: (a) The five-cluster placed 62.5% of the individuals into the correct group; (b) The four-cluster placed 73.9% of the individuals into the correct group; (c) The three-cluster placed 96.1% of the individuals into the correct group (Conti, in press; Conti & Kolody, 1998, 1999). Because ATLAS is concerned with placing individuals into the correct group formed by SKILLS, the 3-cluster solution was selected to serve as the basis for the ATLAS learning instrument (Conti, in press). Because each of the three naturally occurring clusters have similar patterns of learning strategy usage and because of their similarity to groups reviewed, these groups were named Navigators, Problem Solvers and Engagers, with each group relatively equal in distribution in the general population: 36.5%, 31.7% and 31.8% respectively (Conti, in press; Conti & Kolody, 1998, 1999).

Content validity. For ATLAS, content validity is concerned with the degree to which the items are representative of learning strategy characteristics of the three groups.

This was established using the statistical technique of discriminant analysis (Conti, in press; Conti & Kolody, 1998, 1999). This technique was used for each of the 60 items on SKILLS assessment to ensure that the developers had used the most precise wording to assist individuals in discerning if their learning strategy was that of a Navigator, a Problem Solver or an Engager.

The first structure matrix, using all 3,070 data responses, indicated that the primary process that separated the three groups related to how each group went about accomplishing the learning task: Navigators and Problem Solvers began a task by looking externally at resources which would assist them in completing the learning, while Engagers looked inward to determine if they would enjoy the learning situation enough to finish it. The Navigators and Problem Solvers used Identification of Resources and Critical Use of Resources as their primary learning strategies, while Engagers used Confidence and Reward/Enjoyment as their primary learning strategies. This analytical process was 96.1% accurate in discriminating the Navigators and Problem Solvers, as one group, from the Engagers, as a second group (Conti, in press; Conti & Kolody, 1998, 1999). Subsequently, the first statement on ATLAS separates the individuals into groups based on how they embark on a learning situation.

Since the Navigator and Problem Solver groups were co-mingled on the first statement, a second statement was used to separate them. The second structure matrix, using only the Navigator and Problem Solver data responses (2,094), indicated that the primary process that separated these two groups was they way in which they focused on the learning task: Navigators were more concerned with determining exactly what needs to be learned and establishing a plan to ensuring that learning objectives are learned,

whereas Problem Solvers were more focused on identifying a multitude of alternative solutions (Conti, in press). This analysis indicated that Navigators were more focused on the leaning strategies of Attention and Planning, while Generating Alternatives was the primary learning strategy for the Problems Solvers. This analytical process was 98.3% accurate in discriminating the Navigators from the Problem Solvers (Conti, in press; Conti & Kolody, 1998, 1999).

In light of the fact that several members from the study consolidated into the Navigator group (1,121 individuals), a third discriminant analysis was completed to explore the composition of this group. This analysis, which was 80.2% accurate in group placement, indicated that there were two subgroups within the Navigator group (Conti, in press). Subgroup one had a strong preference to use Human Resources while subgroup two was more concerned with the Organization of materials into meaningful ways. These two subgroups were split 45.1% and 54.9% respectively (Conti, in press). Once it was discovered that Navigators were split into two subgroups, the other two groups, Problem Solvers and Engagers, were also investigated for subgroups. The discriminant analysis with the Problem Solver group (973 individuals) was 79.3% accurate in identifying two subgroups; 52.3% of the Problem Solvers were in subgroup one, while 47.7% were in subgroup two. Subgroup one had a stronger preference for Planning, while subgroup two were more interested in the Critical Use of Resources (Conti, in press). The discriminant analysis with the Engager group (976 individuals) also identified two subgroups; 53.2% of the Engagers were in subgroup one, while 46.8% were in subgroup two. Subgroup one had a stronger preference for the use of Human Resources, while subgroup two had a stronger preference for Planning and Conditional Acceptance (Conti, in press). As

indicated above, the accuracy rates for placing individuals into their subgroups were considerably lower than placing individuals into their primary group, indicating that subgroup placement is not as exact as placing them into their primary groups of Navigator, Problem Solver, or Engager.

Content validity for ATLAS was established utilizing discriminant analysis to determine the precise learning strategies pattern used by each group in comparison to the other two groups. Since it was determined that there was a primary concept that split the groups, the statements on ATLAS were arranged so that the individuals would follow a path of questions; therefore the items were arranged in the flow-chart format so that once individuals had made a choice they did not have access to statements which were not relevant to them. While ATLAS contains only five statements in total, each item was founded on discriminant analysis which is a very powerful multivariate statistic.

Criterion related validity. As mentioned in the criterion related validity section of DiSC, criterion related validity is used to examine the relationship of one instrument to another related instrument. However, in the situation with ATLAS, it is difficult to compare the learning instrument with similar learning instruments because ATLAS used a multivariate approach to create an instrument from items that were scored in a univariate format on the original instrument (SKILLS) (Conti, in press). Given this fact, Conti (in press) listed the three steps that were taken to assess the criterion related validity of ATLAS. First, the group placement on ATLAS was compared to the scores on SKILLS, which provided a comparison between the responses of the ATLAS groups and the specific items from SKILLS that were used to establish those groups. The initial comparison of group preferences between ATLAS and the SKILLS parent instrument

was 70% (Conti & Kolody, 1999). Second, participants completed four SKILLS scenarios that were modified to have only two items that represented the learning strategies from the discriminant analysis results utilized in forming the three ATLAS groups. Last, participants were asked to self-report on the accuracy of ATLAS placement of them after they had read the descriptions of all three ATLAS groups; this provided a comparison between the responses on the ATLAS instrument and the real-world of the participants.

Since its inception ATLAS has been used in numerous research studies. One of the major uses of ATLAS has been to stimulate the users' metacognitive process of thinking about how they go about learning (Conti, in press). To further assess the validity of ATLAS, users have been asked to provide feedback on how accurately, they feel, ATLAS as identified their preferred learning strategy. The feedback has consistently been that approximately 90% of the users indicate that ATLAS did in fact place them in the correct learning strategy group (Conti, in press; Conti & Kolody, 2004). Ghostbear (2001) reported that over 90% of her subjects agreed their ATLAS group description accurately identified their preferred learning strategy. Ausburn and Brown (2006) reported similar levels of perceived ATLAS accuracy with Career and Technical Education (CTE) students.

Consequently, because of (a) the consistency between scores on SKILLS and ATLAS group placement; (b) the expected responses based on ATLAS grouping of three-fourths of the items found in modified SKILLS scenarios; and (c) the extremely high testimony of users in regards to the accuracy of learning strategy group placement by ATLAS, it was determined that ATLAS has criterion-related validity (Conti, in press).

Reliability. The reliability of ATLAS was established using the test-retest method which addresses the degree to which scores on the same test are consistent time after time (Gay & Airasian, 2000). Initially ATLAS was administered to a group of 121 adult education practitioners within a two week interval. The coefficient of stability of these two groups, with 110 participants responding the same on both assessments, was .88 (Conti, in press). While there have been well over 40 dissertation research studies exploring the ATLAS instrument, this researcher was unable to locate many that specifically did a test-retest analysis. However a few dissertation studies have examined ATLAS test-retest reliability. One study reported a coefficient of stability of .90 (Willyard, 2000), and a second study (Ghostbear, 2001) reported a coefficient of stability of .84 when ATLAS was re-administered within a one to three week interval. Ausburn and Brown (2006) also reported test-retest reliability for ATLAS at or above .90 in informal studies.

Procedures

Permission was granted, in writing, from the three industries willing to participate in this research study and an IRB application was filed with Oklahoma State University. IRB approval was granted before any field research was conducted.

Data collection for this study occurred in May of 2008. At each participating company, the PI attended regularly-scheduled staff meetings and/or training sessions selected by the company. At these sessions, the PI was introduced and informed the attending personnel about the research and its purpose through use of a standardized research protocol and a Consent Information Sheet. Individuals who agreed to participate after this introduction were instructed to retain their Consent Information Sheet, complete

the research questionnaire (based on DiSC, ATLAS, and demographic questions) and return the questionnaire to the PI by placing it in the envelope provided.

Each participant read and completed a paper-based consent form and questionnaire. Each participant was assigned an ID number which he/she was to write on the questionnaire and on their copy of the Consent Information Sheet. This number was used for data matching purposes only and was never cross-matched to the participants' names. If an individual consented to participate, the instructions indicated the consent form should be removed and retained by the participant.

The questionnaire did not contain any markings or identifiers, all responses were anonymous, and the questionnaire consisted of three sections: (1) *DiSC Personal Profile System 2800 Series*, (2) ATLAS, and (3) demographic information. Section one was a replica of the DiSC instrument where each participant was asked to mark a Most Like Me (Most) and Least Like Me (Least) answer for each of the 28 questions. Section two presented the five ATLAS questions, each with two possible answers, where the participant had to choose one of the two provided responses for each question. Last, section three consisted of the participant answering six demographics questions pertaining to: (a) age, (b) gender, (c) ethnicity, (d) management level, (e) education, and (g) industry. Once the participant completed all three sections the questionnaire was given back to the researcher who then placed it in an envelop.

The participants from American-Fidelity Assurance had previously completed a DiSC assessment as part of their new hire orientation process, whereas the participants from Cox Communications Incorporated and Great Plains Coca-Cola Bottling Company had never had the opportunity to complete their own DiSC Classic Profile. The associates

from American-Fidelity group were not offered a full copy of The *DiSC Personal Profile System 2800 Series* because they were already in possession of a full copy, whereas at the end of the data collection sessions for Cox Communications Incorporated and Great Plains Coca-Cola Bottling Company, associates were offered a full copy of The *DiSC Personal Profile System 2800 Series*. Participants from all three organizations were provided with the website address for ATLAS in case they were interested in learning more about their preferred learning strategy.

Once all of the data were collected, the researcher keyed the information into Excel so that it could be uploaded into SPSS for analysis. The six demographic variables had to be grouped and numerically coded for data analysis.

The questionnaire allowed the participants to enter their exact year of birth. In order to classify the participants into generations, the researcher created some parameters and formulas in the Excel raw data file. First, using Strauss and Howe (1991), some parameters were established for the beginning and ending birth years for each generation: Traditionalists, people born between 1925 and 1942, Baby Boomers, people born between 1943 and 1960, Generation X, people born between 1961 and 1981, and the Millennials, people born between 1982 and 2003. Next the researcher placed all of the birth years (using only the last two digits) from 1925 through 2003 (25-03) in the next column. Then each grouping of birth years was assigned a numeric value to represent each categorical name: Traditionalist birth years (1925-1942) were assigned the value of 1, Baby Boomer birth years (1943-1960) were assigned the value of 2, Generation X birth years (1960-1981) were assigned the value of 3, and Millennial birth years (1982-2003) were assigned the value of 4. The next step was to create a “vlookup” table that would

read the actual year of birth (e.g. 57, 69, or 82) and return the numeric value (1, 2, 3, or 4) associated with that birth year. Once this step was completed, the data were ready to be exported to SPSS for crosstab analysis.

The second research question required the participants to place a mark next to the gender that best represented their identity. Categorical data were assigned a numeric value for codification: Females – 1, Males – 2. The third demographic questions required the participants to place a mark next to the management level that best described their current work position. Categorical data were assigned a numeric value for codification: No Response – 1, Non-management – 2, Supervisor/Front-line manager – 3, Mid-level manager – 4, Senior/Executive manager - 5. The fourth research question required the participants to place a mark next to the ethnicity with which they most closely related. Categorical data were assigned a numeric value for codification: African-American – 1, Asian – 2, Caucasian – 3, Hispanic/Latino – 4, Multi-Racial – 5, Native American – 6, or Other – 7.

The fifth research question required the participants to place a mark next to the highest level of education they completed. Categorical data were assigned a numeric value for codification: No Response – 1, General Education Diploma – 2, High School Diploma – 3, Vocational Education Certificate – 4, Some College – 5, Associates Degree – 6, Bachelors Degree – 7, Masters Degree – 8, and Doctorate/Professional Degree - 9. The last research question required the participants to place a mark next to the Industry in which they currently work. Categorical data were assigned a numeric value for codification: Communication (Cox Communication) – 1, Financial (American-Fidelity Assurance Group) – 2, Beverage (Great Plains Coca-Cola Bottling Company) – 3.

To obtain the information necessary to identify each participant's DiSC Classical Profile Pattern, several calculations had to be performed in Excel to extrapolate the data necessary for export to SPSS for analysis. First, all of the responses for each of the responses in the "Most" column had to be calculated. This was done by entering a formula in Excel that would identify and sum the total number of responses made for each of the four DiSC groups. This resulted in a total score for D-Most, i-Most, S-Most, and C-Most. These scores represent the data for DiSC Graph I (see Chapter 2 for discussion of DiSC graphs). Next, this same process was followed for identifying and summing the total number of responses made in the "Least" column. This resulted in a total score for D-Least, i-Least, S-Least, and C-Least. These scores represent the data for DiSC Graph II.

Third, the data for Graph III had to be calculated. This was done by writing a formula that would take the Graph I information for each of the four groups and net it against the Graph II information (e.g. D-Most minus D-Least equals D-Difference). This calculation was repeated for the remaining three groups. Once these four individual scores were determined, a fourth formula was written that took the information from each of the four individual scores and combined them in a way that, in one cell, produced a combination four-digit sequential code that was used to identify the correct Classical Profile Pattern for each person. The formula command in Excel that performed this "combining" function is called "concatenate."

Next, the researcher entered the 2,401 possible code combinations representing the 15 DiSC Classical Profile Patterns. For each combination, the researcher entered the four-digit numeric code and the corresponding Classical Profile Pattern name. Once these

data were entered, a fifth Excel formula known as “vlookup” was executed to take the four-digit code created by the concatenate formula, find the same code in the Classical Profile Patterns, and return a new numeric code which was used by SPSS to generate the information necessary to address the research questions posed in this study. In summary, this progression of systematic calculations reduced the 56 DiSC data points for each participant into one data point that was used to identify each person’s Classical Profile Pattern and perform the various analyses needed for this study.

ATLAS was originally designed in a booklet format that was user-friendly and provided individuals with immediate feedback on their preferred learning strategy group placement. Since the participants in this study were not receiving feedback on their responses, all five questions from ATLAS were listed as sentence stems with two options (see Appendix B, questions 29-33). In the original ATLAS booklet format, and in the online format, individuals respond only to the sentence stems applicable to their line of responses. However, in this study all five sentence stems and a series of “if” statements were used in Excel to determine each participant’s ATLAS group and subgroup. In summary, the use of “if” statements reduced the data from five separate data points into one data point that could be used to identify each person’s ATLAS group and subgroup, and perform the various analyses needed for this study.

The PI personally secured all data and documents related to the research. The only records that were retained by the PI were the SPSS file. All other documentation was shredded as soon as the SPSS file was created and checked for accuracy. After 3 years, all retained materials will be shredded.

Data Analysis

Data analysis was complex as the DiSC and ATLAS instruments yielded 7,564 data points for the 124 subjects. In addition to this information, data were also collected on age, gender, ethnicity, level of education, management level, and industry for an additional 744 data points. Data collected from the questionnaire were entered into Excel and then uploaded into SPSS for analysis

Five types of analysis were run on the data. First, descriptive statistics and crosstabs were used to profile the participants in relation to the demographic data, DiSC behavior, and ATLAS learning strategy preferences. Second, a one-way chi-square test was used to compare the learning strategy preferences of the participants to the norms of ATLAS. Third, a two-way chi-square test was used to examine any relationships that existed between behavior preferences and learning strategy preferences of the participants. Last, cluster and discriminant analysis techniques were used to identify the characteristics of any naturally occurring groups of individuals and to describe what differentiates among these groups, and a two-way chi square was used to examine any relations that existed between the Ward's method clusters and ATLAS and the demographic data.

Cluster Analysis

When trying to understand data and give it meaning, a researcher can use one of two approaches: (1) inductive reasoning, where the researcher tries to allow meaning and understanding to emerge from the data, or (2) deductive reasoning, where the researcher imposes meaning and understanding upon the data. Cluster analysis is one powerful multivariate tool available to a researcher for inductively identifying groups which

naturally exist in the data; its power lies in its ability to examine an individual in a holistic manner (Conti, 1996, p. 216).

Given the overall procedure associated with cluster analysis, there are three key issues which the researcher must address before running the analysis: (1) identifying which variables to use for establishing the clusters (Conti, 1996), (2) obtaining a measure of inter-individual similarity (Kachigan, 1991; Conti, 1996), and (3) identifying a procedure for creating clusters based on the measures of similarity (Kachigan, 1991; Conti, 1996). In addressing the first issue, the researcher needs to be sure the variables used to cluster the individuals are meaningful to the study, e.g. social attitudes, level of education, ethnicity, behavioral or personality traits, or learning strategies.

In addressing the second issue, the researcher needs to obtain a measure of proximity between each pair of individuals in the study (Kachigan, 1991, p. 262). While there are four measures that can address this issue, correlation coefficients, Euclidean distance, matching-type measures of similarity, and direct scaling of similarities (Kachigan, 1991), only correlation and Euclidean distance coefficients have had widespread use in the social sciences (Aldenderfer & Blashfield, 1984, p. 22).

Once the researcher has determined the measure of inter-individual similarity, the next step is to utilize that information to form clusters. The goal of this step is to get the individuals within each cluster as close or similar as possible, and at the same time to make each group of individuals in one cluster as different as possible from those in another cluster. Or, stated another way, to obtain clusters with relatively small with-in cluster variations and relatively large between cluster variations (Kachigan, 1991).

The last issue a researcher faces when using clustering techniques is determining how many clusters to create (Kachigan, 1991). There are a number of methods to utilize (Aldenderfer & Blashfield, 1984; Kachigan, 1991) when determining how to combine clusters and each method differs in how it estimates the distances between clusters at each successive step (Conti, 1996, p. 69). This study used the Ward's method to determine naturally occurring clusters in the data. The Ward's method, or minimum variance method, is the most commonly used method in the social sciences (Aldenderfer & Blashfield, 1984, p. 43). Ward's method has a strong propensity to split data into groups of relatively equal size. This means that when the naturally occurring clusters differ markedly in size, the larger clusters will be split into smaller clusters relatively equal in size to other smaller naturally occurring clusters. The advantage of Ward's method is that it does not leave any clusters with only one or just a few individuals; all of the individuals are grouped in proportional sizes, which can then be studied further rather simply (Aldenderfer & Blashfield, 1984; Kachigan, 1991).

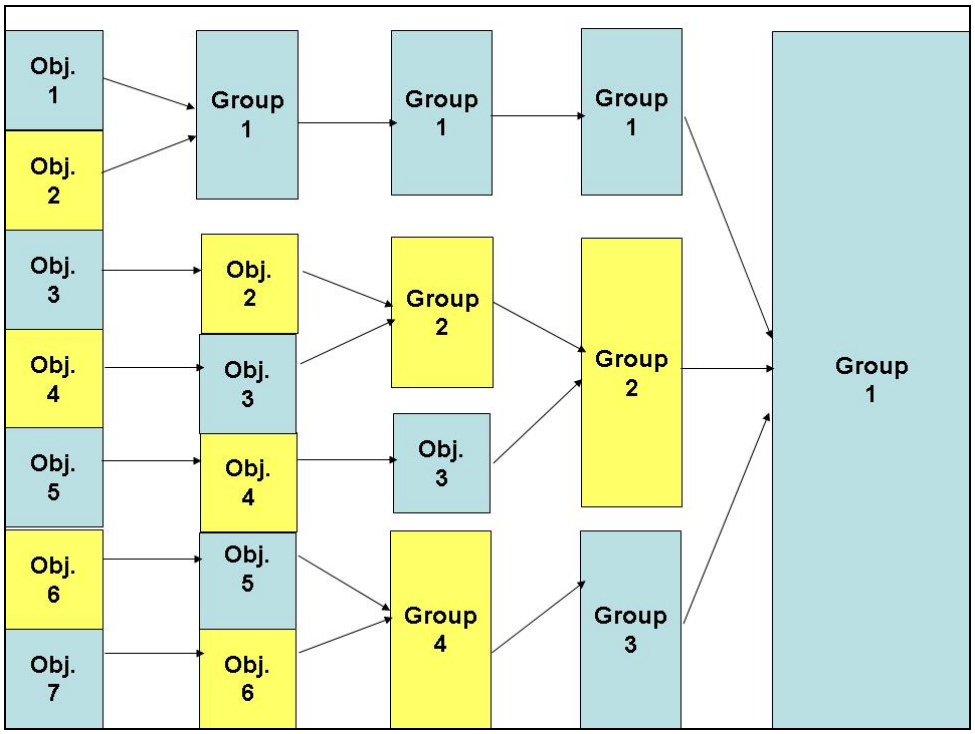

Figure 11. Illustration of Ward's method of clustering. (Source: Aldenderfer & Blashfield, 1984).

While cluster analysis is a powerful tool for identifying naturally occurring groups, additional information is needed to understand the meaning of each cluster and to describe and name them (Conti, 1996, p. 70). When working with purely quantitative information, the most direct method for accomplishing this is to compare each cluster with respect to their means and variances on each variable (Kachigan, 1991, p. 269). However, when the researcher is working with data that are more qualitative by nature, the newly created clusters will need to be analyzed utilizing discriminant analysis to examine: (a) which variables contributed the most to the creation of each cluster, or (b) to gather discriminant function for predicting membership of other individuals (Kachigan, 1991, p. 269).

Discriminant Analysis

While the statistical method of cluster analysis is an influential tool for identifying naturally occurring groups, additional information is necessary to better understand what lies at the core of these groups and to describe and name them (Conti, 1996). According to Kachigan (1991), "Discriminant analysis is a procedure for identifying such relationships between qualitative criterion variables and quantitative predictor variables" (p. 216). Or, it can be explained as a way for a researcher to examine the differences between two or more groups of individuals with respect to multiple variables at the same time (Conti, 1993; Kachigan, 1991; Klecka, 1980). By differentiating groups in this way, the researcher is better informed as to what makes the groups unique and is therefore able to name them more accurately (Conti, 1996).

Essentially, discriminant analysis is an adaptation of regression analysis (Kachigan, 1991) designed for situations where the criterion variables are qualitative and categorical in nature versus quantitative. Conti (1993) and Kachigan (1991) stated that there are two key components of discriminant analysis, e.g. criterion variables and predictor variables, and that the combination of these two components determines an individual's placement in a particular group (Conti, 1993). Criterion variables are the word classification labels associated with individuals in one group (Kachigan, 1991), e.g. democrat or republican; student or faculty; full-time, part-time or prime-time associate; supervisor, mid-level management, or executive management; dominance, influence, steadiness, or conscientiousness; or navigator, problem solver, or engager. Predictor variables are those variables that are the results of the items chosen for analysis (Kachigan, 1991). For example, if the researcher is interested in applicants for different

types of jobs, the researcher might measure the applicants on such characteristics as age, gender, education, ethnicity, or previous work experience (see Figure 12). The goal is to select the variables the researcher believes to be related to an applicant's membership in one of the criterion groups.

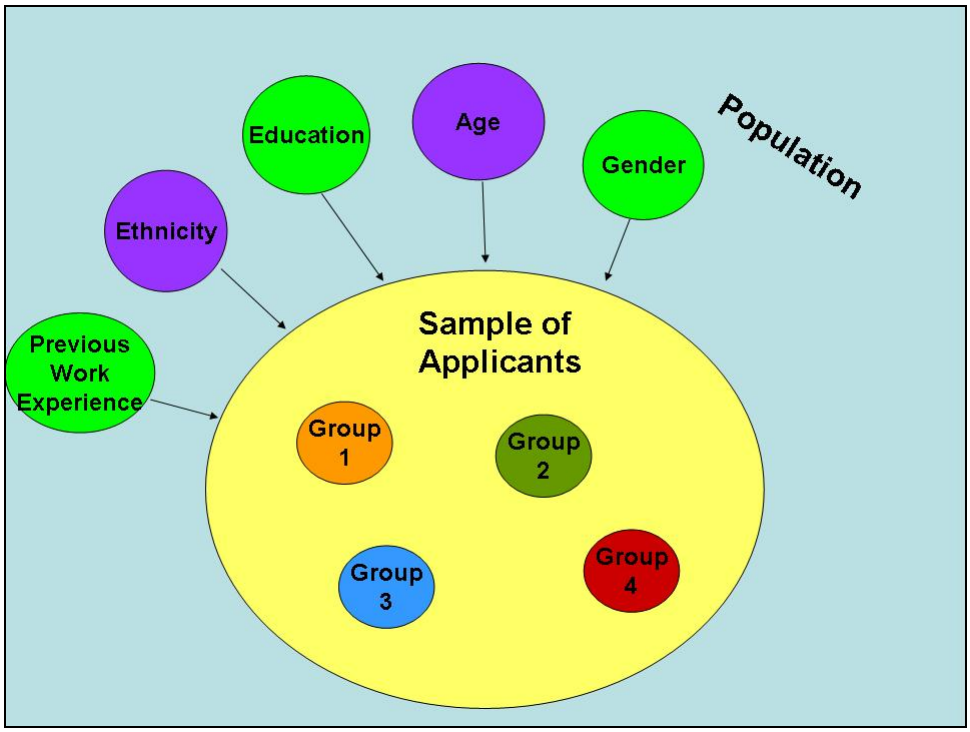

Figure 12. Formation of groups using various variables.

In addition to the two key components, Kachigan (1991, p. 218) provided three key general assumptions, and Klecka (1980, p. 9) provided seven key mathematical assumptions associated with discriminant analysis. Kachigan's key general assumptions are: (1) each group of individuals is mutually exclusive, meaning an individual that is a member of one group cannot be a member of another group; (2) each individual, regardless of group affiliation, is measured on the exact same set of predictor variables; and (3) the number of individuals in each group does not have to be equal to the number of individuals in a different group. Klecka's key mathematical assumptions are: (1) there

must be two or more groups; (2) there must be at least two individuals per group; (3) for any number of discriminating variables provided, it is two less than the number of individuals; (4) discriminating variables must be measured at the interval level; (5) no discriminating variable may be a linear combination of other discriminating variables; (6) the covariance matrices for each group must be relatively equal in size; and (7) each group has been selected from the population with a multivariate normal distribution. Regarding assumption number three, Spicer (2005) recommends that the sample size contain, at a minimum, 20 individuals per independent variable; so if there are five independent variables there would need to be at least 100 individuals in the study.

The results of discriminant analysis may be utilized for two reasons: (1) determining membership in a particular group, and (2) describing the ways in which the groups differ (Conti, 1993, p. 91). In order to accomplish these tasks the researcher must use the three pieces of data that discriminant analysis will produce. First is the discriminant function, which is a formula consisting of the variables and their respective coefficients that will be utilized to place individuals into groups (1993, p. 91). The structure matrix is second and is used to name the discriminant function so that a qualitative term may be established to explain the interaction that exists among the variables and distinguishes one group from the other (1993, p. 91). The last data to be used is the classification table, which indicates the level of accuracy with which individuals were correctly placed in the correct group by the discriminant analysis (1993, p. 91).

In studies utilizing discriminant analysis, the researcher does not propose the typical null hypothesis. Instead hypotheses written in these types of studies use the format

of stating that it is possible to distinguish between groups of individuals using discriminating variables, or the researcher may choose to utilize research questions and ask if it is possible to distinguish between groups of individuals using discriminating variables (Conti, 1992). Regardless of which option the researcher chooses to use, the criteria used for accepting the results of the discriminant analysis should be provided. Conti (1993) states there are two acceptable criteria for determining the acceptance of discriminant analysis as useful. The first is that the discriminant function produced by the analysis is describable using the structure coefficients of analysis; .3 or greater is a frequent criterion (1993, p. 93). The second is that the discriminant function must correctly classify a specified percentage of cases in the sample (1993, p. 93). If these two criteria are done properly then the discriminant function is deemed to be useful.

Summary

As this study was designed to explore whether or not there were any relationships between behaviors measured by DiSC and learning strategies measured by ATLAS, the combination of Ward's method of cluster analysis and discriminant analysis were selected as the two methods necessary to form, describe and name any naturally occurring groups that may exist. The researcher hypothesized that naturally occurring clusters did exist in the study's data; however, there were no preconceived ideas as to how many clusters might exist or how they might be constituted. It was further hypothesized that once clusters emerged from the data, the researcher would be able to use discriminant analysis to explore and describe variables that loaded on each group and then accurately name each group.

CHAPTER 4

FINDINGS

Introduction

This study was based on information collected from 124 participants from three Oklahoma City area business industries: American-Fidelity Assurance Group (AFAG), 43 participants; Cox Communications Incorporated (CCI), 50 participants; and Great Plains Coca-Cola Bottling Company (GPCCBC), 31 participants. These entities represent three of the ten broad industries identified by the U.S Department of Labor: Financial – American-Fidelity Assurance Group; Information – Cox Communications; and Manufacturing – Great Plains Coca-Cola Bottling Company. The participants completed a paper-based questionnaire consisting of three sections: (a) the *DiSC Personal Profile System 2800 Series*, (b) the *Assessing The Learning Strategies of AdultS* (ATLAS) instrument, and (c) a short demographic survey (see Appendix B). The data were used to create profiles of the participants and to facilitate statistical analysis using descriptive statistics, cross-tabs, chi-square analysis, cluster analysis, and discriminant analysis. Table 16 represents the break down of demographic variables by organization.

Table 16. Demographic variables by organization (*N* =124)

	Organization				
	AFAG (n)	CCI (n)	GPCCBC (n)	Total (n)	Total (%)
Age					
Traditionalist	-	-	-	-	0.00%
Baby Boomer	11	7	5	23	18.55%
Generation X	30	36	23	89	71.77%
Millennial	2	7	3	12	9.68%
Gender					
Female	41	13	19	73	58.87%
Male	2	37	12	51	41.13%
Management					
No Response	1	-	-	1	0.81%
Non-management	34	28	25	87	70.16%
Supervisor/Front-line manager	3	12	4	19	15.32%
Mid-level manager	5	8	1	14	11.29%
Senior/Executive manager	-	2	1	3	2.42%
Ethnicity					
African-American	7	2	3	12	9.68%
Asian	1	-	1	2	1.61%
Caucasian	34	35	24	93	75.00%
Hispanic/Latino	-	4	1	5	4.03%
Indonesian	-	-	-	0	0.00%
Island Pacific	-	-	-	0	0.00%
Multi-Racial	-	1	1	2	1.61%
Native American	-	6	1	7	5.65%
Other	1	2	-	3	2.42%
Education					
No Response	-	1	-	1	0.81%
Less than High School	-	-	-	-	0.00%
General Education Diploma	2	-	1	3	2.42%
High School Diploma	9	11	5	25	20.16%
Vocational Education Certificat	2	4	4	10	8.06%
Some College	8	19	8	35	28.23%
Associates Degree	1	2	1	4	3.23%
Bachelors Degree	17	9	8	34	27.42%
Masters Degree	4	4	2	10	8.06%
Doctorate/Professional Degree	-	-	2	2	1.61%
Total	**43**	**50**	**31**	**124**	**100.00%**

Behavior/Personality Profile

A behavior/personality profile of the workforce participants was constructed to address the first research question in this study by using the data collected from the *DiSC Personal Profile System 2800 Series* section of the survey questionnaire (see Appendix

B, questions 1-28). The DiSC instrument classifies individuals into one of four groups, Dominance, Influence, Steadiness, or Conscientiousness, based on individuals' internal needs and their behaviors/personalities created by these needs. Since a person's behavior/personality is comprised of components from each of these four groups, the DiSC assessment combines the four individual group scores to create a complete overall DiSC profile for each person. These profiles are known as the DiSC Classical Profile Patterns (see Appendix A for descriptions of all 18 Classical Profile Patterns).

The responses in this study were distributed over 16 of the 18 Classical Profile Patterns (see Figure 13), with the Undershift and Overshift patterns not represented among the participants. However, more than half (52.42%) were concentrated in three profile patterns and over two-thirds (69.35%) were concentrated in a total of five patterns.

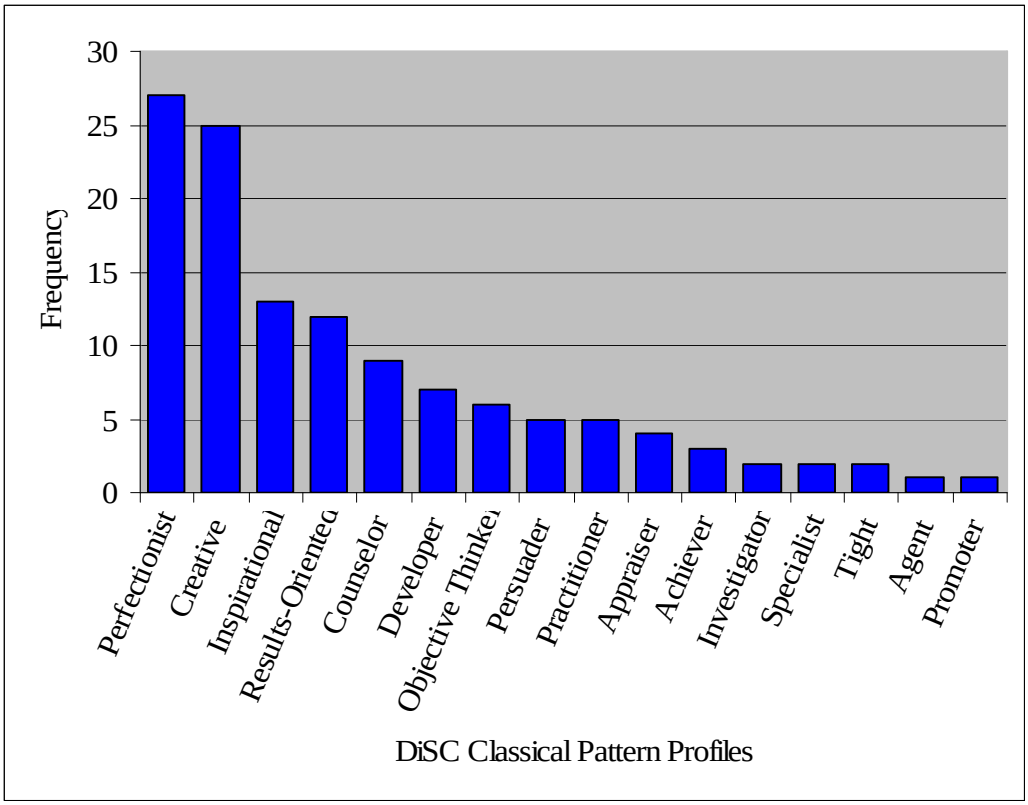

Figure 13. Distribution of DiSC Classical Profile Patterns.

The eighteen Classical Profile Patterns are characterized in behavioral terms (Inscape, 2001). The most prevalent selection made by the Oklahoma City workforce participants was the Perfectionist profile pattern. According to Inscape (2001), Perfectionists may be characterized as systematic, precise thinkers who follow procedure in both their personal and work lives. They get bogged down in the details of the decision making process and they evaluate themselves and others by precise standards for achieving concrete results while adhering to standard operating procedures (p. 17). Approximately one-fifth (21.77%) of the participants *(n*=27) were in this group (see Figure 13).

The Creative pattern was the second most prevalent selection. According to Inscape (2001), Creative individuals may be characterized as people who exhibit

foresight when focusing on projects and they can bring about change. Creative people want freedom to explore and they want the authority to examine and retest findings. Creative individuals may also make daily/simple decision quickly but may be extremely cautious when making bigger decisions (p. 15). Approximately one-fifth (20.16%) of the participants *(n*=25) were in this group (see Figure 13).

The third most prevalent selection made by the Oklahoma City workforce participants was the Inspirational profile pattern. Inscape (2001) profiled Inspirational individuals as those who consciously attempt to modify the thoughts and actions of others; they want to control their environment. Inspirational people are very clear about the results they want, but they do not always immediately verbalize them. Inspirational individuals may be persuasive when they want to assist in repetitive and time-consuming details (p. 16). Approximately one-tenth (10.48%) of the participants *(n*=13) were in this group (see Figure 13).

The Results-Oriented profile pattern was the fourth most prevalent selection. According to Inscape (2001), Results-Oriented individuals display self-confidence, which some may interpret as arrogance. Results-Oriented people tend to avoid constraining factors such as direct controls, time-consuming details and routine work. Results-Oriented individuals may also be viewed as quick thinkers who are impatient and critical of those who are not (p. 18). Approximately one-tenth (9.68%) of the participants *(n*=12) were in this group (see Figure 13).

Several profile patterns had less than 10 participants in them. These were the following patterns: Counselor, Developer, Objective Thinker, Persuader, Practitioner, Appraiser, Achiever, Agent, Promoter, Investigator, Specialist and Tight. Nine of the

participants (7.26%) were in the Counselors profile pattern (see Figure 13). According to Inscape (2001), Counselors may be characterized individuals who are very good at solving the problems of others. Counselors may need assistance in setting and meeting realistic deadlines. When in a position of authority, Counselors tend to be attentive to provide recognition of the members of their group (p. 15).

Seven of the participants (5.65%) were in the Developer profile pattern (see Figure 13). Developers, as described by Inscape (2001), tend to be strong-willed individualists who are constantly seeking new horizons; they are most interested in achieving their own goals. Although they are most often direct and forceful, Developers may also manipulate people and situations to meet their needs (p. 15).

Six of the participants (4.84%) were in the Objective Thinker profile pattern (see Figure 13). Inscape (2001) stated Objective Thinkers tend to have highly developed critical thinking skills; they focus on the facts when drawing conclusions and planning actions. They have a tendency to worry and get weighted down in the minute details. Objective Thinkers like to work with people who prefer to maintain a peaceful work environment (p. 16).

Five of the participants (4.03%) were in the Persuader profile pattern (see Figure 13). Inscape (2001) stated that Persuaders can be described as people who work well with others; however, while being friendly, they tend to push their own personal objectives. The most constructive environment for Persuaders includes working with people, receiving challenging tasks, and experiencing an array of activities that requires mobility (p. 17).

Five of the participants (4.03%) were in the Practitioner profile pattern (see Figure 13).Practitioners like to be viewed as “the expert” in a specific area; however, they like to give the perception they know something about everything. Practitioners have high expectations of themselves and others, and they tend to outwardly express their disappointment (p. 18).

Four of the participants (3.23%) were in the Appraiser profile pattern (see Figure 13). Inscape (2001) described Appraisers as individuals who make creative ideas serve practical purposes. Appraisers are considerate of others and they elicit the cooperation of those around them by exploring the rationale for the proposed activities (p. 14).

Three of the participants (2.42%) were in the Achiever profile pattern (see Figure 13).Where Appraisers are concerned with communicating and involving others, Achievers are more internally focused and are driven by personal not group or team goals. Achievers tend not to delegate or ask for assistance. These individuals tend to think that they have to do it all themselves and they want all the credit (p. 14).

Two of the profile patterns had only one participant (.81%) (see Figure 13). These were the Agent and Promoter profile patterns. Inscape (2001) described Agents as individuals who are attentive to both the human relations and the task aspects of their work situation. They are viewed as empathetic, supportive, and good listeners. Agents are also known for having excellent talents for organizing and completing tasks effectively. Although they are concerned with fitting into a group, Agents also have a level of independence about them (p. 14). Promoters, as described by Inscape (2001), are gregarious and socially adept individuals who develop friendships easily and have an extensive network of contacts. Promoters place a higher level of importance on

interacting with others than they do on completing an actual task or assignment. Promoters thrive on meetings, committees, and conferences.

Three of the profile patterns had only two participants (1.61%) (see Figure 13). These were the Investigator, Specialist, and Tight profile patterns. Inscape (2001) described Investigators as objective and analytical. Investigators do well with challenging technical assignments where they can use real from which to draw conclusions. Investigators are not concerned with pleasing others and they prefer to work alone (p. 16). Inscape (2001) described Specialists as considerate, patient, always willing to assist a friend. They build and maintain close relationships with a small group of friends and associates. Specialists are slow to adapt change and they may need assistance in beginning new projects or developing shortcut methods to meet deadlines (p. 19).

The Tight pattern is not actually a profile. Instead it may indicate that the individual made an error in constructing their data. A Tight pattern occurs when all of the four plotting points are positioned in the middle area of the graph with only one segment difference between the four points. This indicates that the individual considers all four behavior styles to be of equal importance (Inscape, 2001, p. 19). Had this occurred in a non-research environment, the instructor would have worked with the individual to double check all of the individual data points and the plotting of each of the graphs. There are three patterns in total that indicate an error has occurred and needs further exploration. The Tight pattern and the Overshift and Undershift patterns which are not represented in this study.

In summary, each of two groups made up approximately one-fifth of the total group: Perfectionist--21.77% *(n*=27) and Creative--20.16% *(n*=25). The other group was

approximately half this size and made up about one-tenth of the sample: Inspirational at 10.48% *(n*=13). Two other pattern groups were found that were slightly smaller than the Inspirational group: Results-Oriented--9.68% *(n*=12) and Counselor--7.26% *(n*=9). When these two groups were combined with the three groups making up over half of the sample, the new combined group contained over two-thirds (69.35%) of the sample.

Learning Strategy Profile

A learning strategy profile was constructed to address the second research question in this study by using the data collected from the *Assessing The Learning strategies of AdultS* (ATLAS) section of the survey questionnaire (see Appendix B, questions 29-33). The ATLAS instrument identifies an individual's preferred learning strategy. A learning strategy is the technique one uses to accomplish a learning task (Fellenz & Conti, 1989). Conti and Kolody (1998), have asserted that there are three distinct groups of learning strategy preferences: Navigators, Problem Solvers, and Engagers.

The learning strategy preference profile (see Figure 14) for the 124 Oklahoma City workforce participants in this study was as follows: Engagers--40.32% *(n*=50), Problem Solver--32.26% *(n*=40), and Navigator--27.42% *(n*=34). There are two subgroups (see Chapter 3) within each of the ATLAS preference groups and norm distribution of these subgroups is basically 50-50 (Conti, in press). This study indicated that 58.06% *(n*=72) of the participants preferred the learning strategies associated with subgroup one of their respective preferred learning strategy (see Figure 15), while 41.94% *(n*=52) of the participants preferred the learning strategies associated with subgroup two of their respective preferred learning strategy.

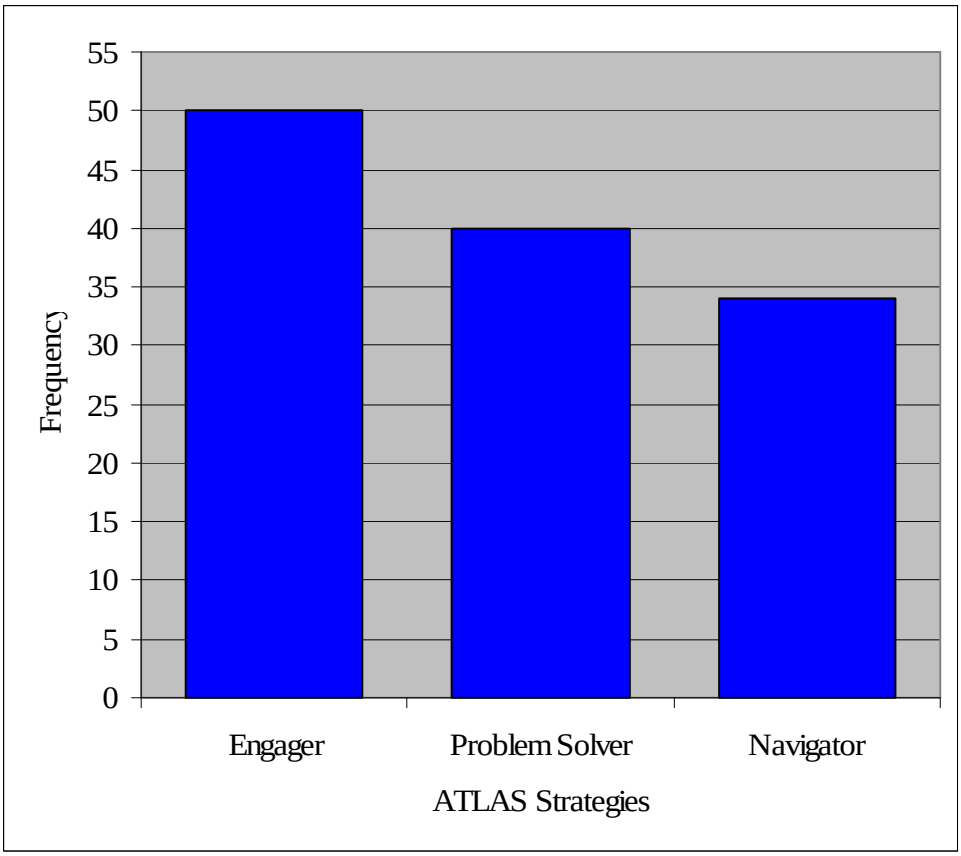

Figure 14. Distribution of ATLAS learning strategies.

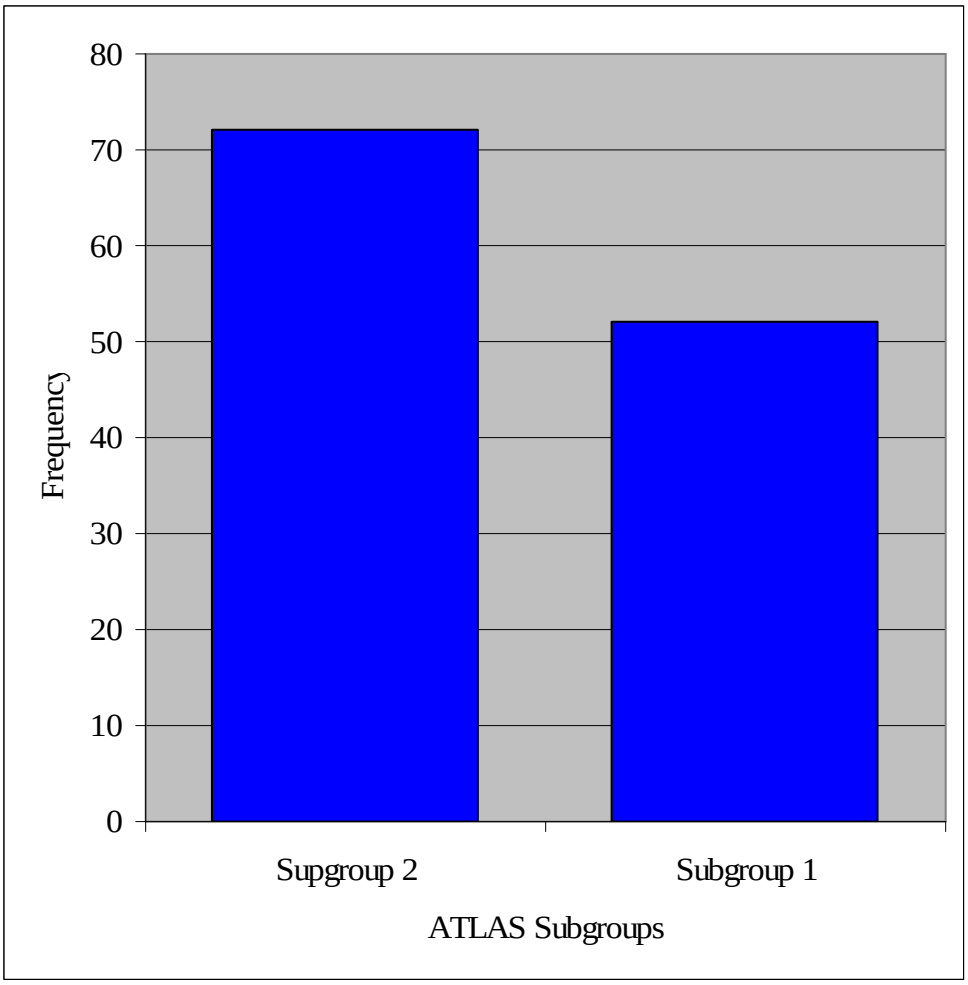

Figure 15. Distribution of ATLAS subgroups.

A chi-square analysis was performed to compare the observed frequencies of the learning strategy preference distribution of the Oklahoma City workforce participants in this study to the expected preferred learning strategy frequency distribution as on the norms for ATLAS (see Chapter 2). Chi-square is a test to determine statistical significance when data are in the form of frequency counts or percentages and proportions that can be converted to frequency counts (Gay & Airasian, 2000, p. 502). Chi-square "compares the proportions observed in the study to the proportions expected, to see if they are significantly different" (p. 502). Because this was a single sample, the

goodness-of-fit statistic was used with a criterion level of .05, which is the most commonly used probability level in educational research. The distribution of the Oklahoma City workforce participants approached but did not quite reach the .05 significance level of difference with the established ATLAS norms (χ^2 = 5.646; *df* = 2; *p* = .059). However, because this study was exploring possible currently unknown relationships between ATLAS and DiSC, it would have been acceptable to use a probability level of .10 which is occasionally used in exploratory studies (Gay & Airasian, 2000, p. 476). While the results of this study did not attain significant at the .05 level they are very close to this level and therefore merit identification as a trend that warrants further investigation.

The Oklahoma City workforce results were different from the ATLAS norms because the Engager group was larger (21.14%) than expected (31.8%) and the Navigator group was smaller (33.12%) than expected (36.5%). There were only slightly more (1.73%) Problem Solvers than expected (31.7%) (see Table 17). Thus, the trainers at these three Oklahoma City businesses could expect to have more Engagers and fewer Navigators than in the general population.

Table 17. Observed and expected distribution of learning strategy groups

Strategy	Observed N	Expected N	Residual
Engager	50	39.43	10.57
Problem Solver	40	39.31	0.69
Navigator	34	45.26	-11.26
Total	124		

χ^2 = 5.646; *df* = 2; *p* = .059

Relationships: DiSC and Demographic Variables

A series of DiSC and demographic crosstabs were calculated to address the third research question in this study using the data collected from the DiSC and Demographic sections of the survey questionnaire (see Appendix B, questions 1-28, and 34-39). Crosstabs, or two-way contingency tables, were used to evaluate whether any statistical relationships existed between the DiSC profiles and each of the six types of demographic data: age, gender, management level, ethnicity, highest level of education completed, and industry.

Green and Salkind (2005) have asserted that there are two assumptions underlying a crosstab analysis. First, the observations are independent of each other. To meet this first assumption, studies should be designed so that there is no interdependency in the data. Simply stated, the researcher controls the total number of participants in the study; however, the researcher does not control how many participants are in each row or column and this is the relationship being evaluated (Green & Salkind, 2005). Second, the analyses will yield a test statistic that is approximately distributed as a chi-square when the sample size is relatively large. There is no straightforward answer to the question: What sample size is large enough? However, a general guideline is there should be a minimum of 20 participants for each variable (Garson, 2006; Spicer, 2005). This study had a total of five variables. The *DiSC Personal Profile System 2800 Series* states that there is some D, i, S, and C in each person, therefore contributing four variables to this study. However, while the DiSC contributes four variables to this study, ATLAS only contributes one, even though there are three different learning strategies. The ATLAS profiles states that each participant is *either* a Navigator, Problem Solver or Engager, not

some of each learning strategy. Thus, at a minimum, this study needed 100 participants to meet the second assumption; this study met this criterion with 124 participants. The chi-square (Pearson r^2) analyses for DiSC by demographic variables (see Table 18) indicated a statistically significant relationship for DiSC by Age ($\chi^2 = 44.023$; $df = 30$; $p = .047$ – see Table 18); however, there were no statistically significant relationships between DiSC and the other five variables.

Table 18. DiSC by Demographic Variables Chi-Square Results

Demographic Variable	***χ2***	***df***	***α***
Age	44.023	30	0.047
Gender	10.832	15	0.764
Management level	58.697	60	0.523
Ethnicity	81.800	90	0.719
Education	134.659	120	0.170
Industry	25.066	30	0.722

Age

Generation X accounted for 71.77% *(n*=89) of the participants, Baby Boomers contributed 18.55% *(n*=23) and Millennials 9.68% *(n*=12) (see Figure 16). There were no Traditionalist participants in this study. As shown in Figure 16, in Generation X, over two-thirds (69.66%) of the participants were concentrated in four of the DiSC Classical Profile Patterns: Perfectionist--25.84% *(n*=23), Creative--21.35% *(n*=19), Inspirational--11.24% *(n*=10), and Results-Oriented--11.24% *(n*=10). The remaining 30.34% *(n*=27) of the participants were scattered among the remaining 10 Classical Profile Patterns. The Agent and Promoter profile patterns were not represented in this age cohort.

Figure 16 shows that the Baby Boomer generation was evenly disbursed over 11 of the 16 represented Classical Profile Patterns, with 10 of the 11 patterns accounting for either 4.35% *(n*=1) or 8.70% *(n*=2) of the participants while the largest pattern, Creative,

represented 26.09% (*n*=6) of the participants. The Appraiser, Investigator, Tight, Agent and Promoter profile patterns were not represented in this age cohort.

The Millennial generation (see Figure 16) was evenly represented over 9 of the 16 represented Classical Profile Patterns. Six of the nine patterns each represented 8.33% (*n*=1) of the participants, while the remaining three patterns each represented 16.67% (*n*=2) of the participants. The Creative, Objective Thinker, Persuader, Achiever, Investigator, Specialist, and Tight profile patterns were not represented in this age cohort.

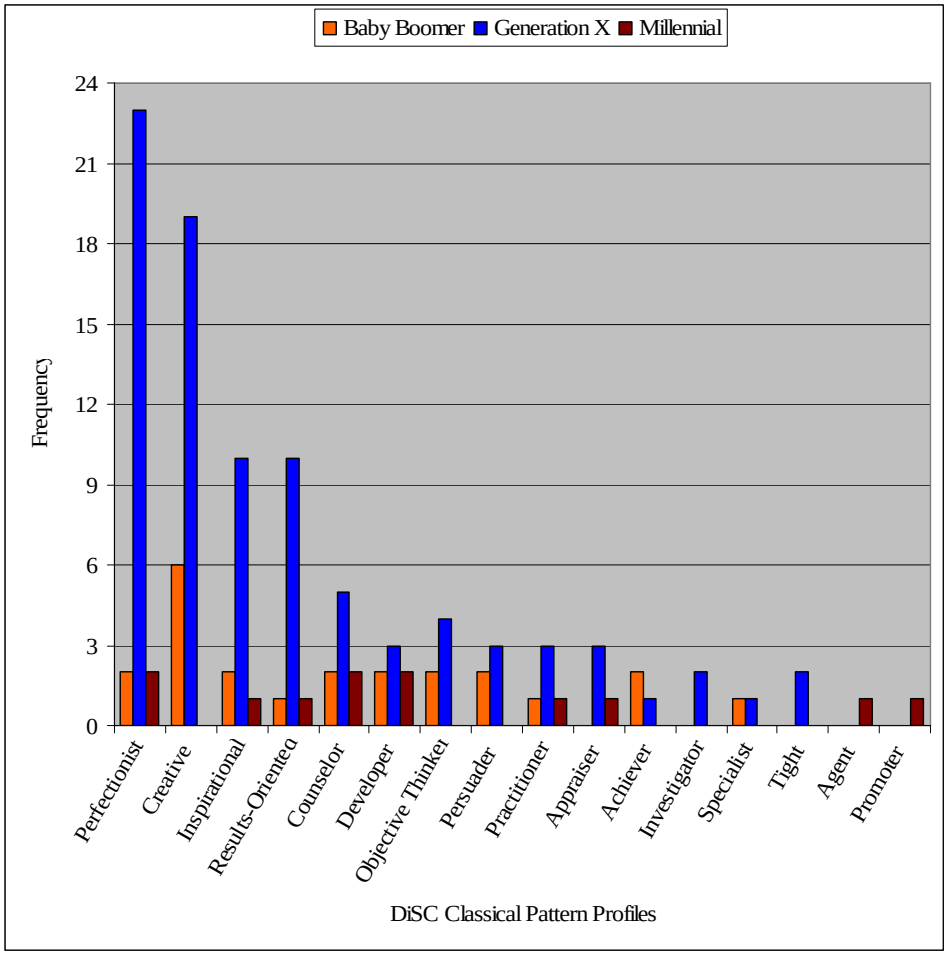

Figure 16. Distribution of DiSC Classic Patterns within Age demographic.

The distribution of DiSC patterns across the generation age groups was significantly different from what was expected by chance norms (χ^2 = 44.023; *df* = 30;

p = .047 – see Table 18). Adjusted standardized residuals were computed (see Table 19) to determine which of the categories were major contributors to a significant chi-square.

Table 19. Adjusted Standardized Residuals of DiSC Classic Patterns within Generation demographic

	Generation						
	Baby Boomer		Generation X		Millennial		
Classical Profiles	**Freq**	**AR**	**Freq**	**AR**	**Freq**	**AR**	**Total**
Tight	-	-0.7	2	-0.9	-	-0.5	**2**
Specialist	1	1.2	1	-0.7	-	-0.5	**2**
Results-Oriented	1	-1.0	10	0.9	1	-0.2	**12**
Promoter	-	-0.5	-	-1.6	1	3.1	**1**
Practitioner	1	0.1	3	-0.6	1	0.8	**5**
Persuader	2	1.3	3	-0.6	-	-0.7	**5**
Perfectionist	2	-1.7	23	1.8	2	-0.5	**27**
Objective Thinker	2	1.0	4	-0.3	-	-0.8	**6**
Investigator	-	-0.7	2	0.9	-	-0.5	**2**
Inspirational	2	-0.3	10	0.4	1	-0.3	**13**
Developer	2	0.7	3	-1.7	2	1.7	**7**
Creative	6	0.8	19	0.5	-	-1.8	**25**
Counselor	2	0.3	5	-1.1	2	1.3	**9**
Appraiser	-	-1.0	3	0.1	1	1.1	**4**
Agent	-	-0.5	-	-1.6	1	3.1	**1**
Achiever	2	2.2	1	-1.5	-	-0.6	**3**
Total	**23**		**89**		**12**		**124**

When the standardized residual of a category is greater than 2.00 (in absolute value) (Haberman, 1978), it may be concluded that the category is a major contributor to the significant chi-square value. In other words, the sample distribution of cases in such categories does not fit the expected or hypothesized distribution.

The significant chi-squares indicated that the groups are not independent of each other based on age. The participants in the Baby Boomer group are very high (2.2) in the Achiever pattern but almost equally low (-1.7) in the Perfectionist pattern (see Table 19). Participant distributions are about normal or zero in the remaining 14 DiSC Classical Profile Patterns.

The participants in the Generation X group are somewhat high (1.8) in the Perfectionist Pattern but equally as low in the Promoter (-1.6), Developer (-1.7), Agent (-1.6), and Achiever (-1.5) patterns (see Table 19). Participant distributions are about normal to zero in the remaining 11 DiSC Classical Profile Patterns.

The Millennial group is extremely high (3.1) in both the Promoter and Agent patterns with the Developer pattern approaching a high level (1.7) of significance (see Table 19). The only pattern of this generation that is not a major contributor to the significant chi-square is the Creative pattern (-1.7). Participant distributions are about normal to zero in the remaining 12 DiSC Classical Profile Patterns.

In summary, the Baby Boomer group had more participants than expected in the Achiever pattern and fewer participants than expected in the Perfectionist pattern. Generation X had slightly more participants than expected in the Perfectionist pattern and slightly fewer participants than expected in the Promoter, Developer, Agent and Achiever Patterns. The Millennial Generation had considerably more participants than expected in both the Promoter and Agent profiles, slightly more participants than expected in the Developer profile, and slightly fewer participants than expected in the Creative profile. The remaining 10 profiles did not play a role in the significant χ^2 of this demographic (see Table 19).

Gender

Females accounted for 58.87% *(n*=73) of the participants and males accounted for 41.13% *(n*=51) of the participants (See Table 16).

The female cohort saw 68.50% *(n*=50) of their population in 5 of the 16 Classical Profile Patterns. Each of two groups made up approximately one-fifth of the total group:

Perfectionist--23.29% *(n*=17) and Creative--19.18% *(n*=14). The other group was approximately half this size and made up about one-tenth of the sample: Inspirational--9.59% *(n*=7). Two other groups were slightly smaller than the Inspirational group: Results Oriented--8.22% *(n*=6) and Counselor--8.22% *(n*=6). The remaining ten Classical Profile Patterns had between 5.48% *(n*=4) and 1.37% *(n*=1) of the sample. Thus, 15 of the 16 Classical Profile Patterns were represented in the female sample, the bulk of the members were in 5 of the 16 profiles. The Appraiser profile pattern was not represented in the female sample.

The male cohort saw 64.70% *(n*=33) of their population in 4 of the 16 Classical Profile Patterns. Each of two groups made up approximately one-fifth of the total group: Creative--21.57% *(n*=11) and Perfectionist--19.61% *(n*=10). The other two groups were approximately half this size and made up about one-tenth of the sample: Inspirational--11.76% *(n*=7) and Results-Oriented--11.76% *(n*=7). The remaining nine Classical Profile Patterns had between 7.84% *(n*=4) and 1.96% *(n*=1) of the sample. Thus, 13 of the 16 Classical Profile Patterns were represented in the male sample, the bulk of the members were in 4 of the 16 profiles. Investigator, The Agent and Promoter profile patterns were not represented in the male sample.

The distribution of DiSC patterns across the gender groups was not significantly different from what was expected by chance (χ^2 = 10.832; *df* = 15; *p* = .764 – see Table 18).

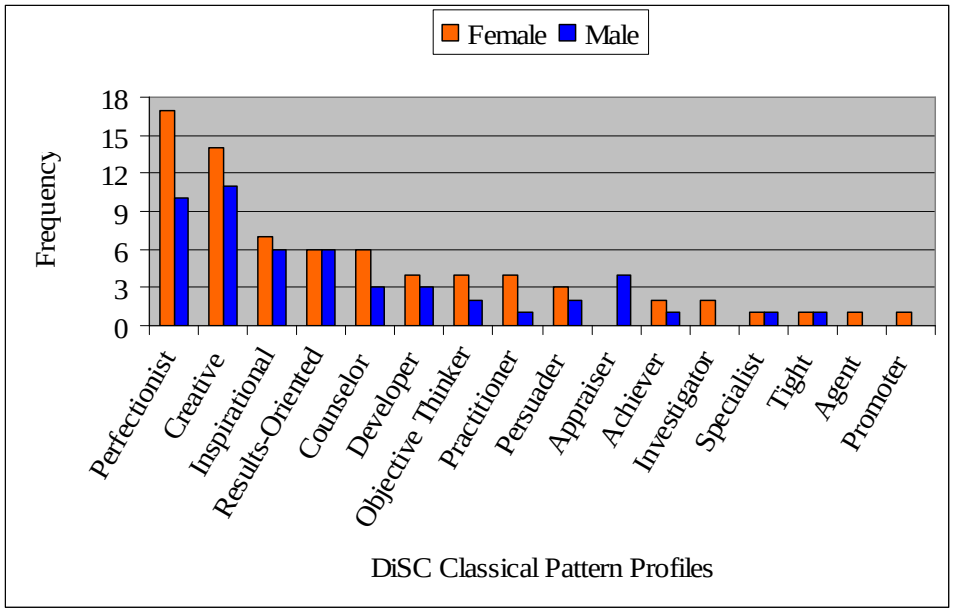

Figure 17. Distribution of DiSC Classic Patterns within Gender demographic.

Management

Non-management accounted for 70.16% of the sample (*n*=87), Supervisor/Front-line manager accounted for 15.32% (*n*=19), Mid-level manager accounted for 11.29% (*n*=14), and Senior/Executive manager account for 2.42% (*n*=3) of the participants (see Table 16). There was one participant who did not respond to this question.

The Non-management cohort saw 59.76% (*n*=52) of their group in 4 of the 16 Classical Profile Patterns. One group made up approximately one-fifth of the total group: Perfectionist--22.99% (*n*=20). The Creative profile created 14.94% (*n*=13) of this group and the other two groups were slightly smaller and made up about one-tenth of the sample: Results-Oriented--11.49% (*n*=10) and Inspirational--10.34% (*n*=9). The remaining 12 Classical Profile Pattern groups had between 6.90% (*n*=6) and 1.15% (*n*=1) of the sample. Thus, all 16 Classical Profile Patterns were represented in this Non-management sample, but the bulk of the members were in 4 of the 16 profiles.

Supervisor/Front-line managers were represented in 8 of the 16 Classical Pattern Profile groups with Creative--47.37% *(n*=9) being the largest profile pattern group. The remaining seven Classical Profile Pattern groups had between 15.79% *(n*=3) and 5.26% *(n*=1) of the sample. Thus, 8 of the 16 Classical Profile Patterns were represented, with the bulk located in one profile. The Persuader, Practitioner, Appraiser, Achiever, Investigator, Tight, Agent, and Promoter profile patterns were not represented in this sample of Supervisor/Front-line managers.

Mid-level managers were represented in 6 of the 16 Classical Pattern Profile groups with 50% *(n*=7), concentrated in two groups: Perfectionist--28.57% *(n*=4) and Creative--21.43% *(n*=3). The remaining six Classical Profile Pattern groups had between 14.29% *(n*=2) and 7.14% *(n*=1) of the sample. Thus, 8 of the 16 Classical Profile Patterns were represented, with the bulk located in two profiles. The Results-Oriented, Counselor, Practitioner, Achiever, Specialist, Tight, Agent, and Promoter profile patterns were not represented in this sample of Mid-level managers.

Senior/Executive managers were represented in 2 of the 16 Classical Pattern Profile groups: Perfectionist--66.67% *(n*=2) and Inspirational--33.33% *(n*=1).

The distribution of DiSC patterns across the management level groups was not significantly different from what was expected by chance (χ^2 = 58.697; *df* = 60; *p* = .523 – see Table 18).

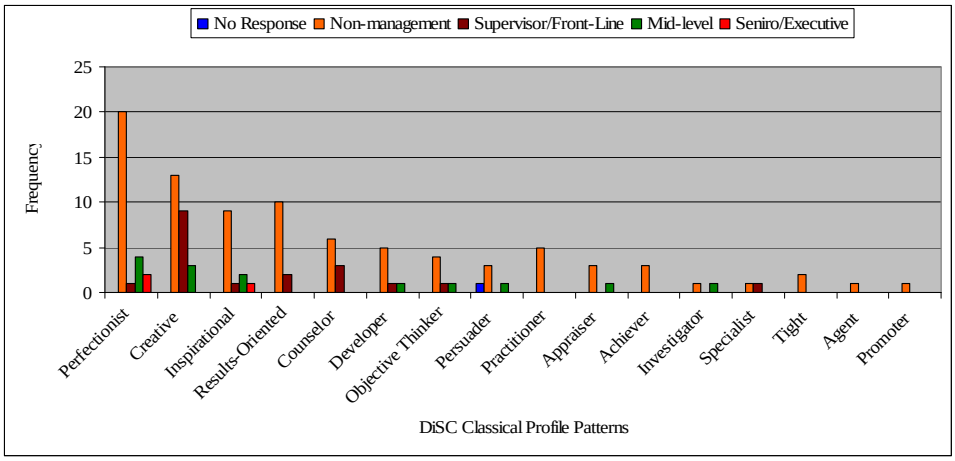

Figure 18. Distribution of DiSC Classic Patterns within Management demographic.

Ethnicity

Caucasians were by far the largest sample group representing 75.00% (*n*=93) of the population, followed by African-Americans with 9.68% (*n*=12), Native Americans with 5.65% (*n*=7), Hispanic/Latinos with 4.03% (*n*=5), Other with 2.42% (*n*=3), and both Asian and Multi-Racial with 1.61% (*n*=2) (see Table 16).

Caucasians were represented in 15 of the 16 Classical Pattern Profile groups, but approximately two-thirds (64.52%, n=60) were concentrated in four groups. Each of two groups made up approximately one-fifth of the total group: Creative--21.51% (*n*=20) and Perfectionist--20.43% (*n*=19). The other two groups were approximately half this size and made up about one-tenth of the sample: Results-Oriented--11.83% (*n*=11) and Inspirational--10.75% (*n*=10). The remaining 11 Classical Profile Pattern groups had between 6.45% (*n*=6) and 1.08% (*n*=1) of the sample. Thus, 15 of the 16 Classical Profile Patterns were represented, with the bulk located in four profiles. The Promoter profile pattern was not represented in this Caucasian sample.

African-Americans were represented in 8 of the 16 Classical Profile Pattern groups with Perfectionist--33.33% *(n*=4) being the largest group. The remaining seven Classical Profile Pattern groups had between 16.67% *(n*=2) and 8.33% *(n*=1) of the sample. Thus, 8 of the 16 Classical Profile Patterns were represented, with the bulk located in one profile. The Results-Oriented, Developer, Appraiser, Achiever, Investigator, Specialist, Tight, Agent and Promoter profile patterns were not represented in this sample of African-Americans.

Native Americans were represented in 6 of the 16 Classical Profile Pattern groups. The Counselor profile carried 28.57% *(n*=2) of the sample, while Perfectionist, Creative, Inspirational, Appraiser, and Investigator each carried 14.29% *(n*=1) of the sample.

Hispanics/Latinos were represented in 4 of the 16 Classical Profile Pattern groups. The Perfectionist profile carried 40.00% *(n*=2) of the sample, while Results-Oriented, Developer, and Persuader each carried 20.00% *(n*=1) of the sample.

Asians were represented in 2 of the 16 Classical Profile Pattern groups, as were those who identified as Multi-Racial. Asians were split 50/50 between the Creative and Appraiser profiles, while multi-racial individuals were split 50/50 between Perfectionist and Creative profiles.

The distribution of DiSC patterns across the ethnic groups was not significantly different from what was expected by chance (χ^2 = 81.800; *df* = 90; *p* = .719 – see Table 18).

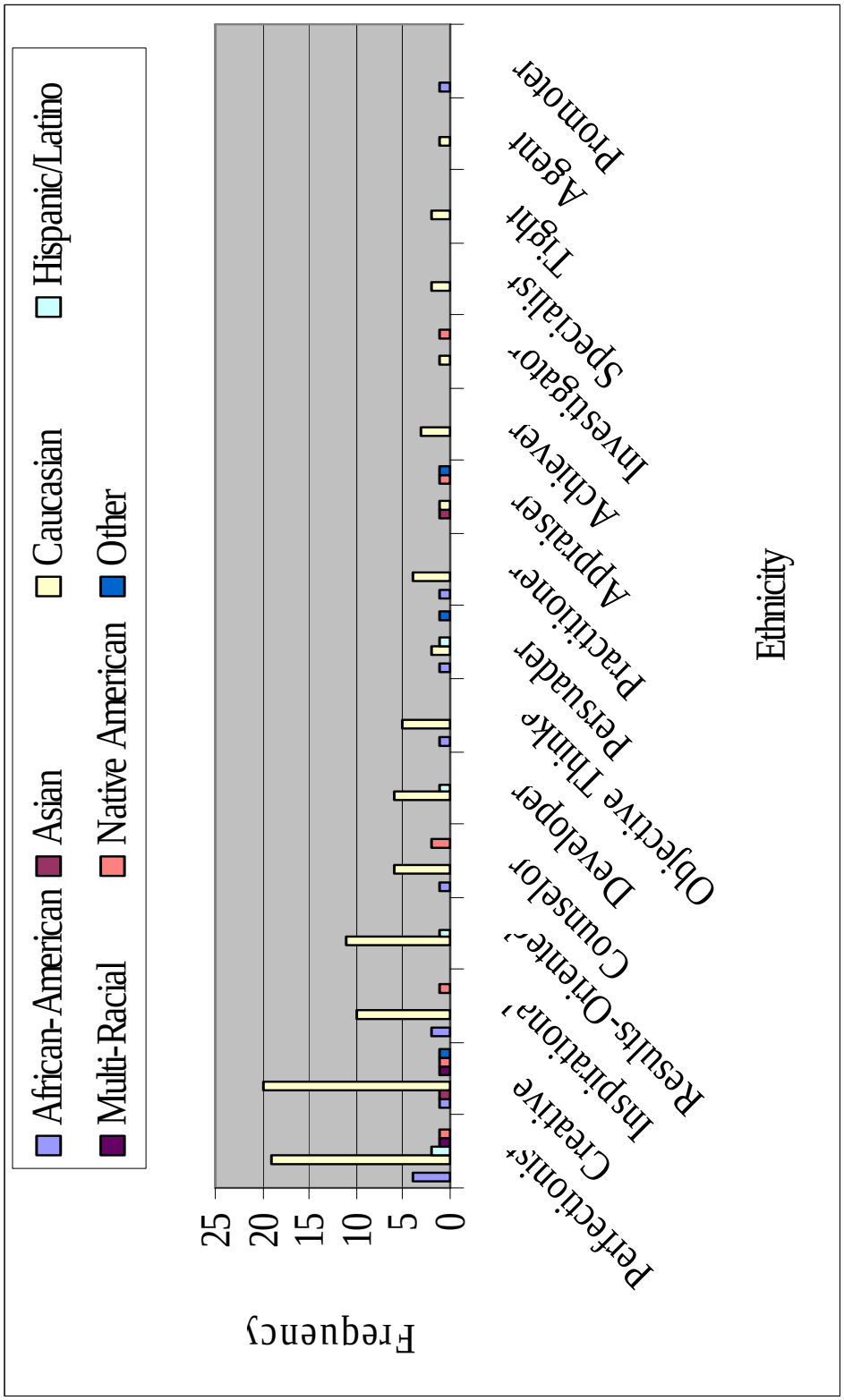

Figure 19. Distribution of DiSC Classic Patterns within Ethnicity demographic.

Education

While there was representation from all educational levels (see Figure 20), three-fourths (75.81%, *n*=94) was concentrated in three groups. Each of two groups made up approximately three-tenths of the total group: Some College--28.23% *(n*=35) and Bachelors Degree--27.42% *(n*=34). The other group was slightly smaller and made up about one-fifth of the sample: High School Diploma--20.16% *(n*=25). These three groups were followed by Vocational Education Certificate--8.06% *(n*=10), Masters Degree--8.06% *(n*=10), Associates Degree--3.23% *(n*=4), General Education Diploma--2.42% *(n*=3), Doctorate/Professional Degree--1.61% *(n*=2), and No Response--.81% *(n*=1).

The Some College group was represented in 14 of the 16 Classical Profile Patterns, with approximately two-fifths (42.86%, *n*=15) concentrated in three groups: Creative--17.14% *(n*=6), Results-Oriented--14.29% *(n*=5), and Counselor--11.43% *(n*=4). The remaining 11 Classical Profile Patterns had between 8.57% *(n*=3) and 2.86% *(n*=1) of the sample. Thus, 14 of the 16 Classical Profile Patterns were represented, with the bulk located in three profiles. The Specialist and Tight profile patterns were not represented in the Some College sample.

The Bachelors Degree group was represented in 7 of the 16 Classical Profile Patterns, with approximately two-thirds (58.82%, *n*=20) concentrated in two groups: Creative--32.35% *(n*=11), and Perfectionist--26.47% *(n*=9). The remaining five Classical Profile Patterns had between 14.71% *(n*=5) and 2.94% *(n*=1) of the sample. Thus, 7 of the 16 Classical Profile Patterns were represented, with the bulk located in two profiles. The Perfectionist, Creative, Counselor, Developer, Objective Thinker, Persuader,

Appraiser, Investigator, Specialist, Tight, Agent, and Promoter profile patterns were not represented in the Bachelors Degree sample.

The High School Diploma group was represented in 10 of the 16 Classical Profile Patterns, with approximately half (52.00%, *n*=13) identified in the Perfectionist profile. The remaining nine Classical Profile Patterns carried either 8.00%% *(n*=2) or 4.00% *(n*=1) of the sample. Thus, 10 of the 16 Classical Profile Patterns were represented, with the bulk located in one profile. The Objective Thinker, Practitioner, Appraiser, Investigator, Agent, and Promoter profile patterns were not represented in the High School Diploma sample.

The remaining Education groups did not have any clear groupings of participants. Information on the General Education Diploma, Vocational Education Certificate, Associates Degree, Doctorate/Professional Degree and No Response groups is represented in Figure 20.

The distribution of DiSC patterns across the education groups was not significantly different from what was expected by chance (χ^2 = 134.659; *df* = 120; *p* = .170 – see Table 18).

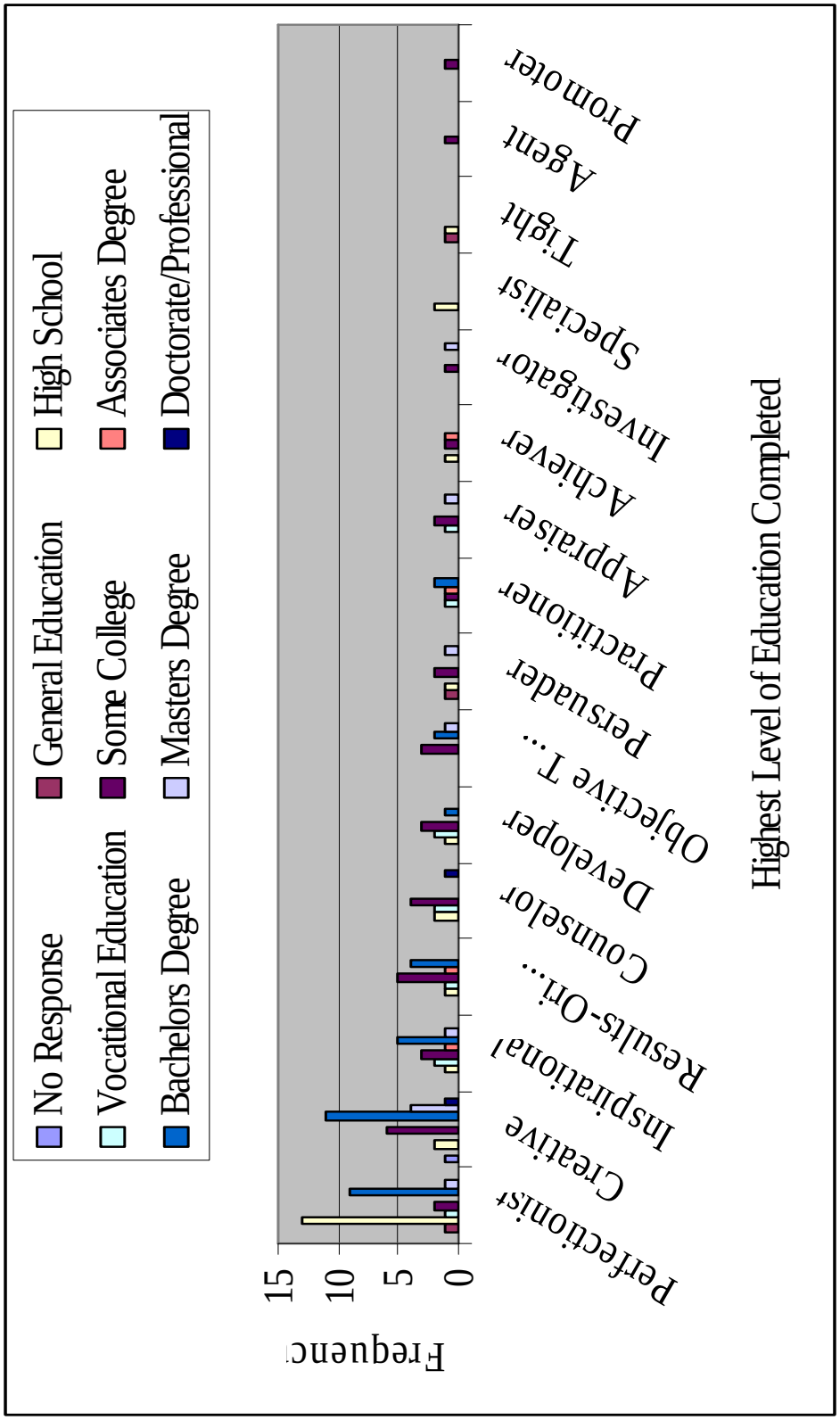

Figure 20. Distribution of DiSC Classic Patterns within Education demographic.

Industry

Cox Communications (information industry) provided the largest participant group--40.32% *(n*=50), followed by American-Fidelity Assurance Group (financial industry)--34.68% (43), and Great Plains Coca-Cola Bottling Company(manufacturing industry)--25.00% *(n*=31) (see Figure 21).

The information industry responses were distributed over 13 of the 16 Classical Profile Patterns, with over half, 62.00% *(n*=31), of the population concentrated in four groups. Two groups made up approximately one-fifth of the total group: Creative--22.00% *(n*=11) and Perfectionist--18.00% *(n*=9). The other two groups were about half this size and made up about one-tenth of the sample: Results-Oriented--12.00% *(n*=6) and Inspirational--10.00% *(n*=5). The remaining nine Classical Profile Patterns had between 8.00% *(n*=4) and 2.00% *(n*=1) of the sample. Thus, 13 of the 16 Classical Profile Patterns were represented in the Information population; the majority of the participants were in 4 of the 16 profiles. The Practitioner, Agent and Promoter profile patterns were not represented in the Information group.

The financial industry responses were distributed over 11 of the 16 Classical Profile Patterns, with approximately half, (51.16%, n=22), concentrated in two groups: Perfectionist--30.23% *(n*=13) and Creative--20.93% *(n*=9). The remaining nine Classical Profile Patterns had between 9.30% *(n*=4) and 2.33% *(n*=1) of the sample. Thus, 11 of the 16 Classical Profile Patterns were represented in the financial sample; the majority of the participants were in 2 of the 16 profiles. The Developer, Appraiser, Investigator, Specialist and Promoter profile patterns were not represented in the financial group.

The manufacturing industry, specifically represented in this study by the beverage industry, responses were distributed over 13 of the 16 Classical Profile Patterns, with approximately half, (48.39%, n=15), evenly distributed in three groups: Perfectionist--16.13% (*n*=5), Creative--16.13% (*n*=5), and Inspirational--16.13% (*n*=5). The remaining nine Classical Profile Pattern groups had between 9.68% (*n*=3) and 3.23% (*n*=1) of the sample. Thus, 13 of the 16 Classical Profile Patterns were represented in the beverage sample; the majority of the participants were in 3 of the 16 profiles. The Objective Thinker, Tight and Agent profile patterns were not represented in the Beverage group.

The distribution of DiSC patterns across the industry groups was not significantly different from what was expected by chance (χ^2 = 25.066; *df* = 30; *p* = .722 – see Table 18).

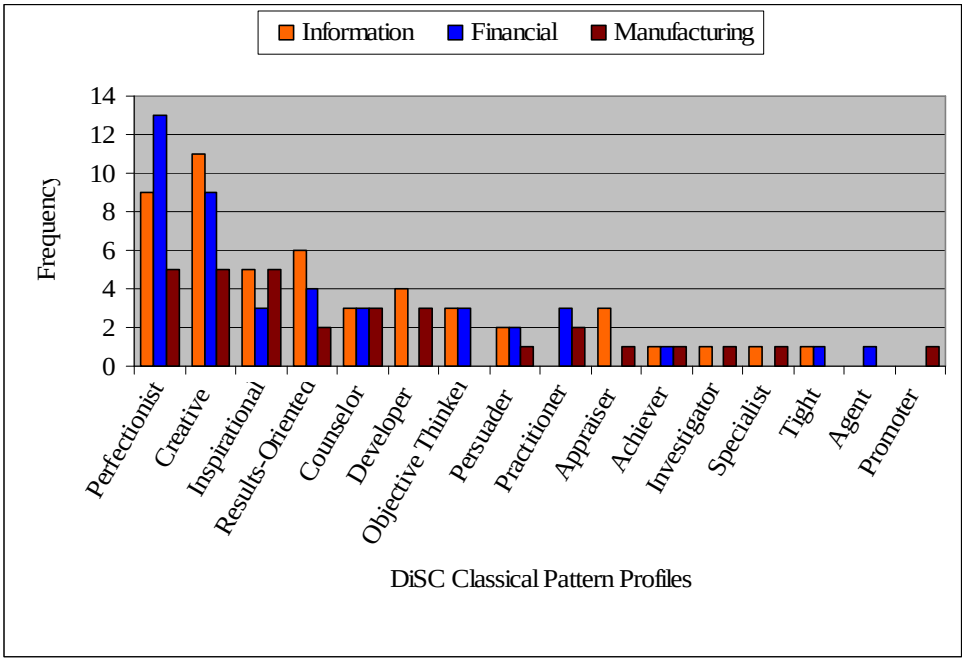

Figure 21. Distribution of DiSC Classic Patterns within Industry demographic.

Relationships: ATLAS and Demographic Variables

A series of ATLAS and demographic crosstabs were calculated to address the fourth research question in this study using the data collected from the ATLAS and the demographic sections of the survey questionnaire (see Appendix B, questions 29-39). Crosstabs, or two-way contingency tables, were used to evaluate whether any statistical relationships existed between the ATLAS profiles and each of the six types of demographic data: age, gender, management level, ethnicity, highest level of education completed, and industry. The chi-square analyses for ATLAS by demographic variables (see Table 20) did not indicate any statistically significant relationships at .05 level. However, the ATLAS by industry analysis approached significance ($\alpha = .068$) and suggested a trend ($\alpha \leq .10$) that may warrant further investigation.

Table 20. ATLAS by Demographic Variables Chi Square Results

Demographic Variable	***χ2***	***df***	***α***
Age	4.33597	4	0.362
Gender	3.24358	2	0.198
Management level	12.5938	8	0.127
Ethnicity	11.6801	12	0.472
Education	19.7756	16	0.230
Industry	8.75067	4	0.068

Age

Generation X accounted for 71.77% *(n*=89) of the participants, Baby Boomers 18.55% *(n*=23), and Millennials 9.68% *(n*=12) (see Figure 22). There were no Traditionalist participants in this study.

In Generation X, two-fifths, 40.45% *(n*=36), of the participants were identified as Engagers; approximately three-tenths, 34.83% *(n*=31), as Problem Solvers; and one-fourth, 24.72% *(n*=22), as Navigators.

The Baby Boomer generation indicated approximately two-fifths, 43.48% *(n*=10), of the participants were Navigators; approximately three-tenths, 34.78% *(n*=8), were Engagers; and one-fifth, 21.74% *(n*=5), were Problem Solvers.

The Millennial group was defined as half, 50% *(n*=6), Engagers; one-third, 33.33% *(n*=4), Problem Solvers; and approximately one-sixth, 16.67% *(n*=2), Navigators.

The distribution of ATLAS learning strategies across the generational age groups was not significantly different from what was expected by chance (χ^2 = 4.33; *df* = 4; *p* = .362 – see Table 20).

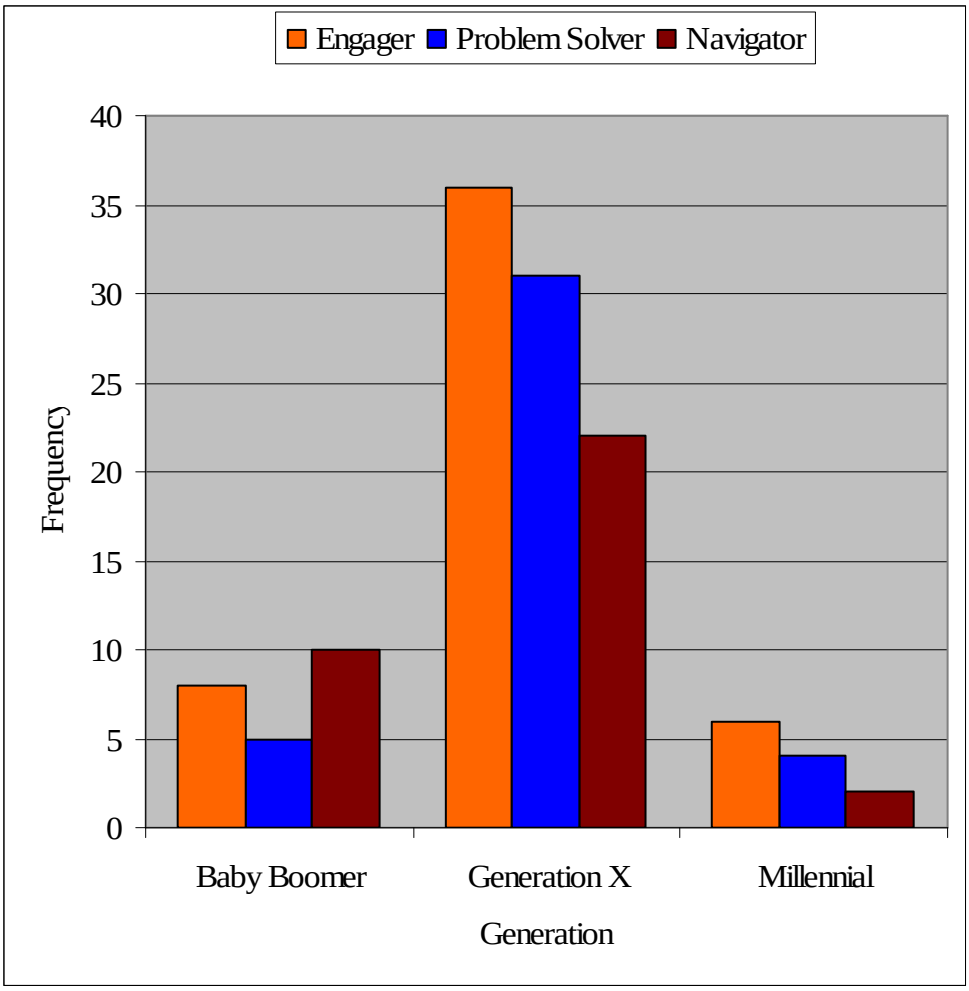

Figure 22. Distribution of ATLAS within Age demographic.

Gender

Females accounted for 58.57% (*n*=73) of the participants and Males accounted for 41.13% (*n*=51) of the participants (See Figure 23).

The female group was divided nearly evenly between the three learning strategy profiles: Engagers were the largest group and represented almost two-fifths, 39.73% (*n*=29), of the sample; followed by Navigators with 32.88% (*n*=24); and Problem Solvers with 27.40% (*n*=20) of the sample.

The male group indicated their population had a larger number of participants in two groups, over four-fifths (80.40%) in two of the three groups. Each of two groups accounted for approximately two-fifths of the total group: Engager--41.18% *(n*=21) and Problem Solver--39.22% *(n*=20). The third group was approximately half this size and accounted for the remaining one-fifth of the sample: Navigator--19.61% *(n*=10).

The distribution of ATLAS learning strategies across the gender groups was not significantly different from what was expected by chance (χ^2 = 3.24358; *df* = 2; *p* = .198 – see Table 20).

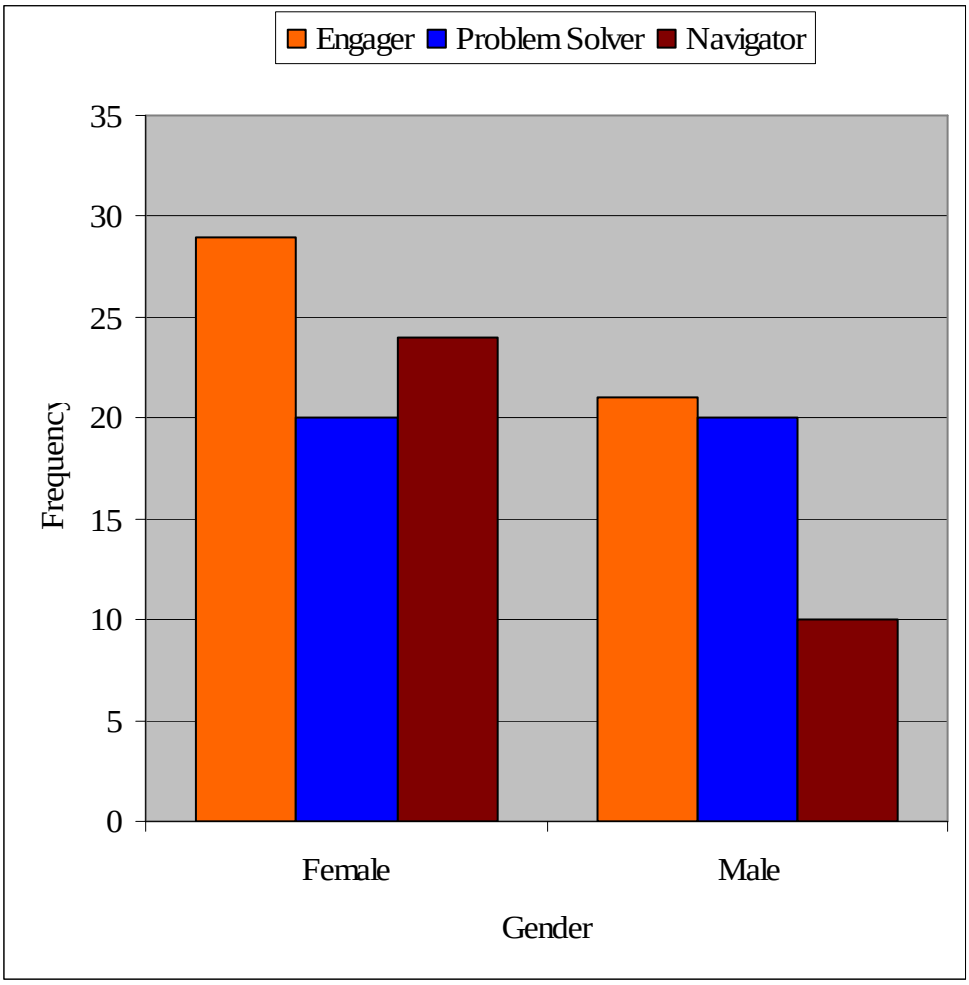

Figure 23. Distribution of ATLAS within Gender demographic.

Management

Non-management accounted for 70.16% (*n*=87), Supervisor/Front-line manager accounted for 15.32% (*n*=19), Mid-level manager accounted for 11.29% (*n*=14), and Senior/Executive manager account for 2.42% (*n*=3) of the participants (see Figure 24). There was one participant, identified as a Problem Solver, who did not respond to this question.

In the Non-management group, approximately two-fifths, 42.53% (*n*=37), of the participants identified as Engagers; approximately three-tenths, 32.18% (*n*=28), as Problem Solvers; and one-fourth, 25.29% (*n*=22), as Navigators.

The Supervisor/Front-line manger group indicated approximately half, 52.63% (*n*=10), of the participants identified as Navigators; approximately one-fourth, 26.32% (*n*=5), as Problem Solvers; and one-fifth, 21.05% (*n*=4), as Engagers.

The Mid-level manager group was comprised of approximately three-fifths, 57.14% (*n*=8), Engagers; three-tenths, 28.57% (*n*=4), Problem Solvers; and one-tenth, 14.29% (*n*=2), Navigators.

The Senior/Executive manager group reflected two-thirds, 66.67% (*n*=2) of the participants identified as Problem Solvers and one-third, 33.33% (*n*=1) as Engagers. The management group had no participants who identified with the Navigator learning strategy.

The distribution of ATLAS learning strategies across the management level groups was not significantly different from what was expected by chance (χ^2 = 12.5938; *df* = 8; *p* = .127 – see Table 20).

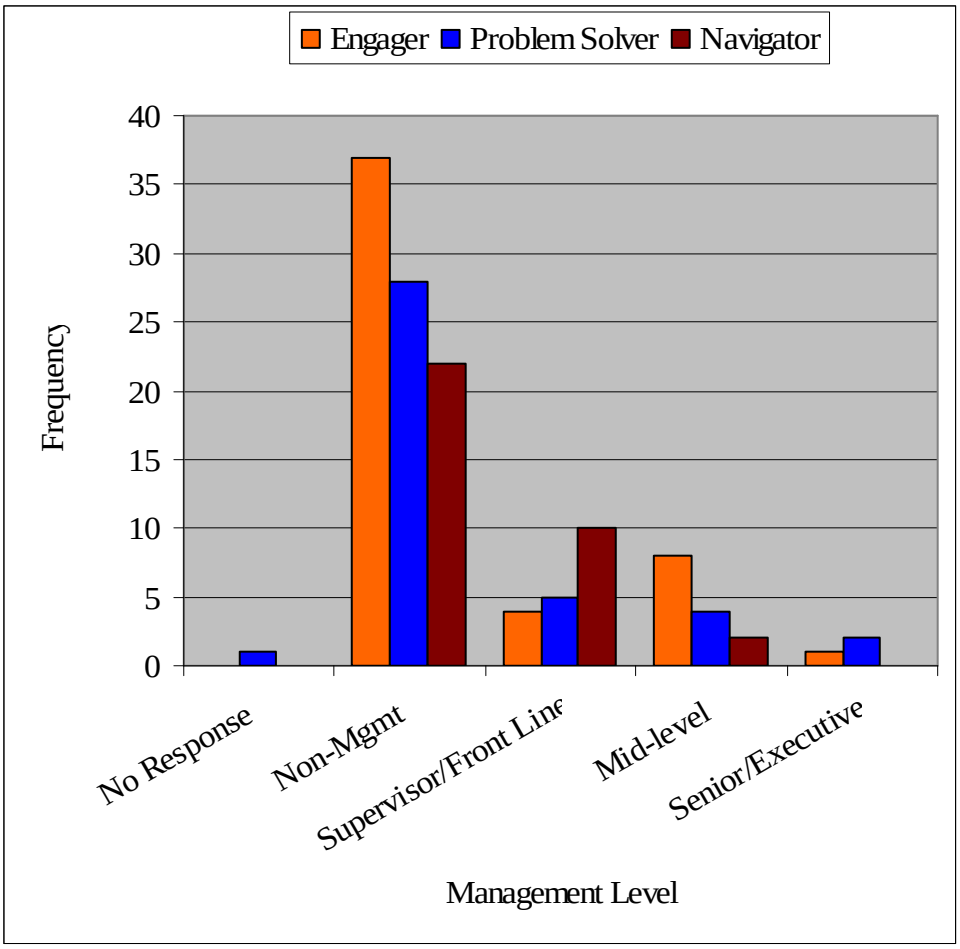

Figure 24. Distribution of ATLAS within Management demographic.

Ethnicity

Caucasians were by far the largest ethnic group representing 75.00% (*n*=93) of the sample, followed by African-Americans with 9.68% (*n*=12), Native Americans with 5.65% (*n*=7), Hispanic/Latinos with 4.03% (*n*=5), Other with 2.42% (*n*=3), and both Asian and Multi-Racial with 1.61% (*n*=2) (see Figure 25).

In the Caucasian group, approximately two-fifths, 39.78% (*n*=37), of the participants identified as Engagers; approximately three-tenths, 31.18% (*n*=29), as Problem Solvers; and three-tenths, 29.03% (*n*=27), as Navigators. The African-American

group identified as two-fifths, 41.67% *(n*=5), Problem Solvers; one-third, 33.33% *(n*=4), Engagers; and one-fourth, 25.00% *(n*=3), Navigators.

The Native American group identified as approximately three-fourths, 71.43% *(n*=5), Engagers; and approximately one-fourth, 28.57% *(n*=2), Problem Solvers. The Navigator learning strategy was not represented in this ethnic group. The Hispanic/Latino group had twice as many participants in the Engager--40.00% *(n*=2) and Problem Solver--40.00% *(n*=2) learning strategies than the Navigator--20.00% *(n*=1) learning strategy.

The Other group had 66.67% *(n*=2) in the Navigator learning strategy and 33.33% *(n*=1) in the Problem Solver learning strategy with no representation in the Engager learning strategy. The Asian group had two participants in the Engager learning strategy and no representation in either the Problem Solver or Navigator learning strategies. The Multi-Racial group was divided between two of the three learning strategies; Problem Solver *(n*=1) and Navigator *(n*=1) with no representation in the Engager learning strategy.

The distribution of ATLAS learning strategies across the ethnic groups was not significantly different from what was expected by chance (χ^2 = 11.6801; *df* = 12; *p* = .472 – see Table 20).

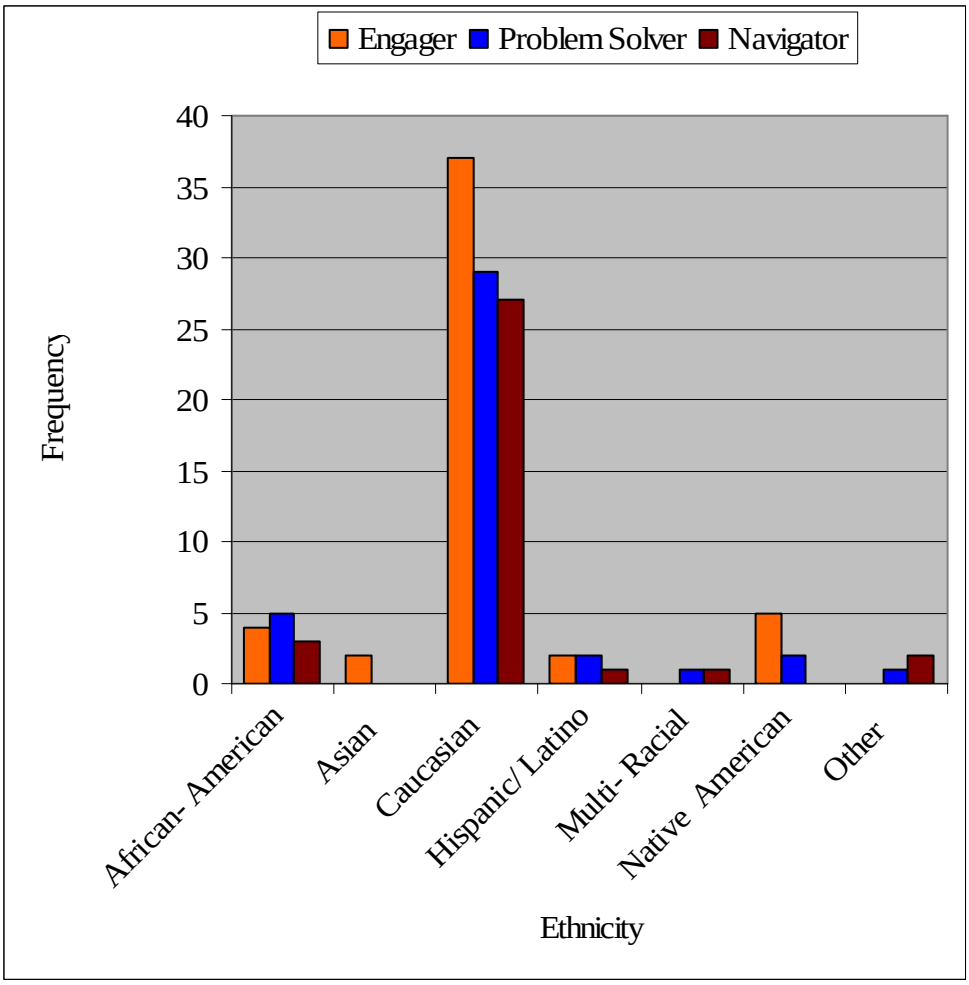

Figure 25. Distribution of ATLAS within Ethnicity demographic.

Education

While there was representation from all educational levels (see Figure 26), three-fourths (75.81%, *n*=94) was concentrated in three groups. Each of two groups made up approximately one-fourth of the total group: Some College--28.23% *(n*=35) and Bachelors Degree--27.42% *(n*=34). The other group was slightly smaller and made up approximately one-fifth of the sample: High School Diploma--20.16% *(n*=25). These three groups were followed by Vocational Education Certificate--8.06% *(n*=10), Masters Degree--8.06% *(n*=10), Associates Degree--3.23% *(n*=4), General Education Diploma--

2.42% *(n*=3), Doctorate/Professional Degree--1.61% *(n*=2), and No Response--.81% *(n*=1).

The Some College group was identified as approximately half, 54.29% *(n*=19), Engagers; approximately one-fourth, 25.71% *(n*=9), Problem Solvers; and one-fifth, 20.00% *(n*=7), Navigators. The Bachelors Degree group indicated that participants were almost evenly distributed among the three learning strategies: Engager--35.29% *(n*=12), Navigator--35.29% *(n*=12), and Problem Solver--29.41% *(n*=10). The representation of learning strategies groups varied by approximately 10% in the High School Diploma group: Engager--44.00% *(n*=11), Problem Solver--32.00% *(n*=8), and Navigator--24.00% *(n*=6).

The Vocational Education Certificate group and the Masters Degree group each accounted for 8.06% *(n*=10) of the total participants. The Vocational Education Certificate group indicated half, 50% *(n*=5), of the participants identified with the Navigator learning strategy and the remaining participants almost evenly split between the Engager 30.00% *(n*=3) and Problem Solver 20.00% *(n*=2) learning strategies. The Masters Degree group indicated half, 50% *(n*=5), of the participants identified with the Problem Solver learning strategy and the remaining participants almost evenly split between the Navigator 30.00% *(n*=3) and Engager 20.00% *(n*=2) learning strategies.

The Associates Degree group had a total of four participants, two identified with the Engager learning strategy and two identified with the Problem Solver learning strategy; the Navigator learning strategy was not represented in this group. The General Education Diploma group had three participants who identified with the Problem Solver learning strategy; the Engager and Navigator learning strategies were not identified in

this educational group. The Doctorate/Professional Degree group had two participants, one of the participants identified as an Engager while the other identified as a Navigator; the Problem Solver learning strategy was not identified in this group. One participant, identified as a Problem Solver, did not respond to this question.

The distribution of ATLAS learning strategies across the education groups was not significantly different from what was expected by chance (χ^2 = 19.7756; *df* = 16; *p* = .230 – see Table 20).

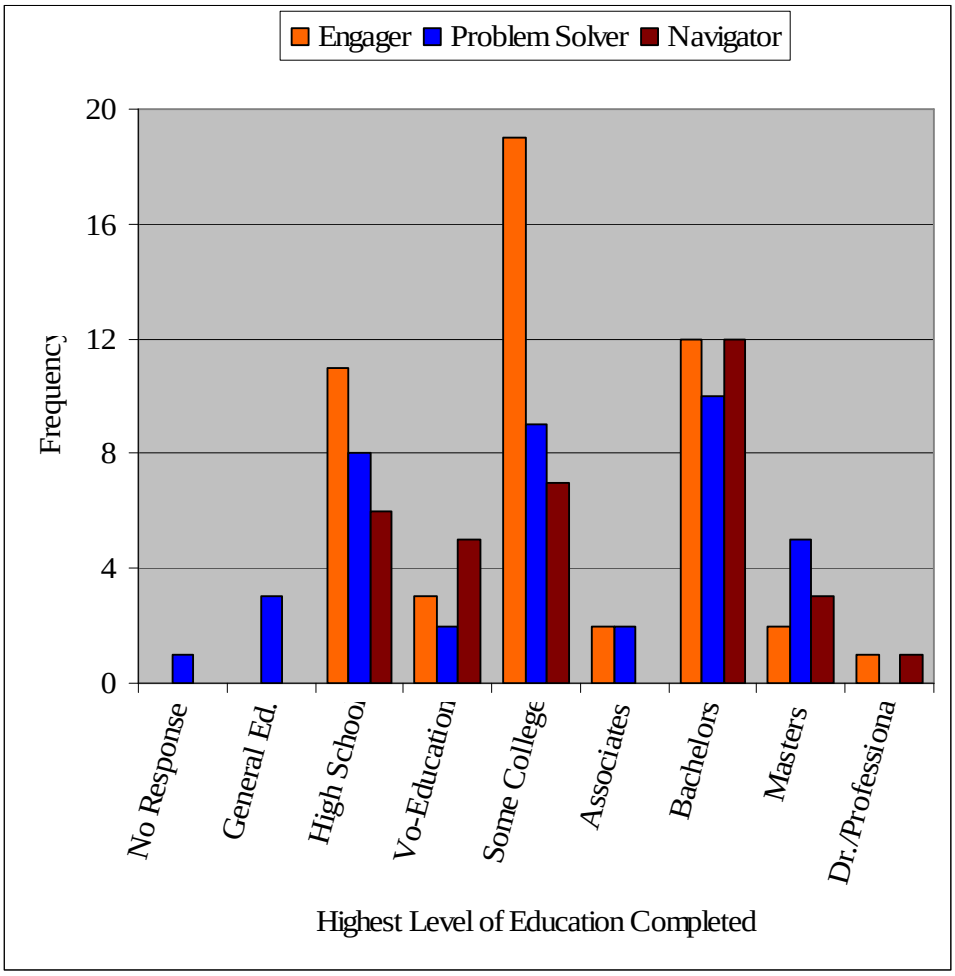

Figure 26. Distribution of ATLAS within Education demographic.

Industry

Cox Communications provided the largest participant group--40.32% (*n*=50), followed by American-Fidelity Assurance Group--34.68% (*n*=43), and Great Plains Coca-Cola Bottling Company--25.00% (*n*=31) (see Figure 27).

The Information group identified as almost half, 46.00% (*n*=23), Problem Solvers; approximately one-third, 36.00% (*n*=18), Engagers; and almost one-fifth, 18.00% (*n*=9), Navigators. The Financial group identified as almost half, 46.51% (*n*=20), Engagers; nearly one-third, 30.23% (*n*=13), Navigators; and approximately one-fourth, 23.26% (*n*=10), Problem Solvers. The Manufacturing group identified both Engager--38.71% (*n*=12) and Navigator--38.71% (*n*=12) learning strategies with the most participants followed by the Problem Solver learning strategy which accounted for the remaining 22.58% (*n*=7) participants.

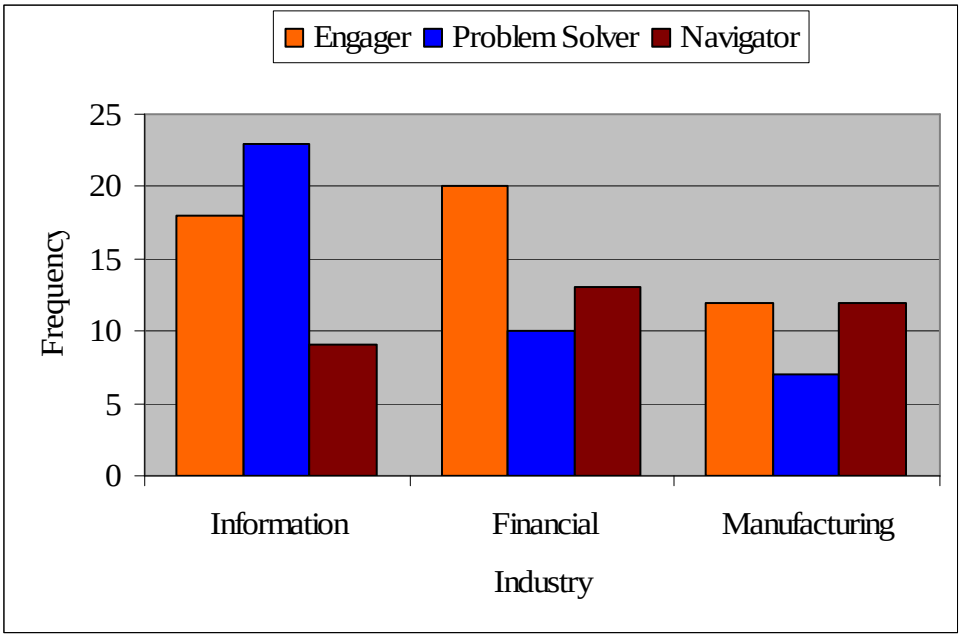

Figure 27. Distribution of ATLAS within Industry demographic.

The distribution of ATLAS learning strategies across the industry groups approached being significantly different at the .05 level from what was expected by chance (χ^2 = 8.75067; *df* = 4; *p* = .068 – see Table 20) and suggests a trend that warrants further research and analysis. Adjusted standardized residuals were computed (see Table 21) to determine which of the categories were major contributors to a significant chi-square.

Table 21. Adjusted Standardized Residuals of ATLAS Learning Strategies within Industry demographic

	Industry						
	Information		Financial		Manufacturing		
ATLAS	Freq	AR	Freq	AR	Freq	AR	Total
Engager	18	-0.8	20	1.0	12	-0.2	**50**
Problerm Solver	23	2.7	10	-1.6	7	-1.3	**40**
Navigator	9	-1.9	13	0.5	12	1.6	**34**
Total	**50**		**43**		**31**		**124**

The significant chi-squares indicated that the groups were not independent of each other based on industry. The participants in the Information group were very high (2.7) in the Problem Solver learning strategy but approached a level that was approaching a significantly low (-1.9) value in the Navigator learning strategy (see Table 21). The Engager learning strategy (-0.8) was about normal or zero.

The participants in the Financial group were somewhat low (-1.6) in the Problem Solver learning strategy (see Table 21) but were about normal to zero in both the Engager (1.0) and Navigator (0.5) learning strategies.

The Manufacturing group was slightly elevated (1.6) in the Navigator learning strategy and slightly lower (-1.3) in the Problem Solver learning strategy (see Table 21). The Engager learning strategy (-0.2) was about normal or zero.

In summary, the Information group had more participants than expected in the Problem Solver learning strategy and fewer participants than expected in the navigator learning strategy. The Financial group had fewer participants than expected in the Problem Solver learning strategy while the Manufacturing group had more participants than expected in the Navigator learning strategy. The Engager learning strategy did not play a role in the significant chi-square of this demographic (see Table 21).

Relationships: DiSC and ATLAS

DiSC and ATLAS crosstabs were calculated and a chi-square analysis was generated to address the fifth research question in this study. Crosstabs, or two-way contingency tables, were used to evaluate whether any statistical relationships existed between the DiSC profiles and the ATLAS learning strategies. The chi-square analysis did not indicate any statistical relationships between the two variables of needs-driven behavior and preferred learning strategy as measured by these instruments ($\chi^2 = 29.7685$, $df = 30$, $p = .478$). The DiSC responses were distributed over 16 of the 18 Classical Profile Patterns (see Figure 28), but over half (52.42%) were concentrated in three patterns. Each of two patterns made up approximately one-fifth of the total group: Perfectionist--21.77% *(n*=27) and Creative--20.16% *(n*=25). The other pattern was approximately half this size and made up about one-tenth of the sample: Inspirational--10.48% *(n*=13). Two other patterns were slightly smaller than the Inspirational group: Results-Oriented--9.68% *(n*=12) and Counselor--7.26% *(n*=9). When these two groups were combined with the three groups making up over half of the sample, the new combined group of patterns contained over two-thirds (69.35%) of the sample. The remaining 11 Classical Profile Patterns had few members, with the groups ranging in

size from 3.81% (*n*=1) to 5.65% (*n*=7). In the ATLAS learning strategies, the Engager strategy accounted for 40.32% (*n*=50) of the participants, the Problem Solver strategy accounted for 32.26% (*n*=40), and the Navigator strategy accounted for 27.42% (*n*=34).

The Engager learning strategy was represented in 14 of the 16 Classical Profile Patterns with almost three-fourths, 70.00% (*n*=35) of the participants in five of the profile patterns. The Perfectionist profile comprised over one-fourth, 28.00% (*n*=14), of the Engager learning strategy. The other four groups were almost one-third this size and made up about one-tenth of the Engager learning strategy: Creative--12.00% (*n*=12), Inspirational--10.00% (*n*=5), Counselor--10.00% (*n*=5), and Developer--10.00% (*n*=5). The remaining nine Classical Profile Pattern groups had between 2.00% (*n*=1) and 8.00% (*n*=4) and formed the remaining 30% of the Engager learning strategy. The Tight and Promoter profile patterns were not represented in this learning strategy.

The Problem Solver learning strategy was observed in 14 of the 16 Classical Profile Patterns, with over half, 55.00% (*n*=22), of the participants grouped in four of the profile patterns. Perfectionist--17.50% (*n*=7) was the largest profile pattern in the Problem Solver strategy, followed very closely by Creative--15.00% (*n*=6), Inspirational--12.50% (*n*=5) and Results-Oriented--10.00% (*n*=4). The remaining 10 Classical Profile Pattern groups had between 2.50% (*n*=1) and 7.50% (*n*=3) and represented the remaining 45% of the Problem Solver learning strategy. The Agent and Promoter profile patterns were not represented in this learning strategy.

The Navigator learning strategy was represented in 10 of the 16 Classical Profile Patterns, with over two-thirds, 67.67% (*n*=23), of the participants congregated in three of the profile patterns. Creative--38.24% (*n*=13) reflected the largest profile pattern among

Navigators. The next largest Classical Profile Pattern, Perfectionist, was approximately half this size, 17.65% *(n*=6), followed closely by the Results-Oriented profile pattern with 11.76% *(n*=4) of the participants. The remaining seven Classical Profile Patterns had between 2.94% *(n*=1) and 8.82% *(n*=3) of the participants and represented the remaining 32.35% of the navigator learning strategy. The Appraiser, Achiever, Investigator, Specialist, Tight, and Agent profile patterns were not represented in this learning strategy.

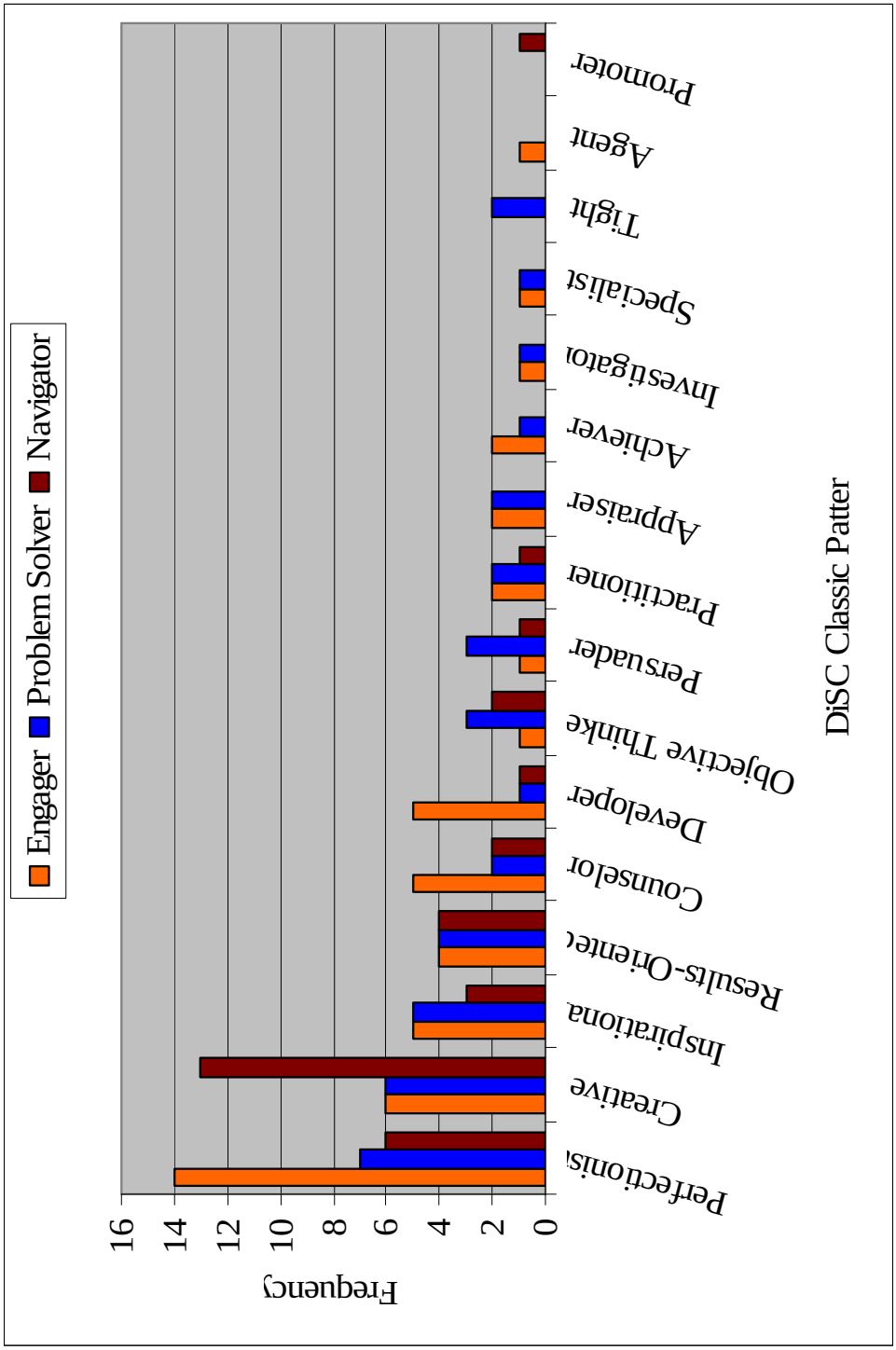

Figure 28. Distribution of ATLAS within DiSC Classical Profile Patterns.

Naturally-Occurring Groups Among the DiSC Groups

Several statistical procedures were used to address the sixth research question of identifying and describing naturally-occurring groups based on DiSC responses. First, cluster analysis was used to identify the naturally-occurring groups. Once groups were identified, discriminant analysis was used to describe the process that separated the groups. Finally, chi-square was used to describe the differences among the groups.

Cluster Analysis

Hierarchical cluster analysis utilizing the Squared Euclidean Distance and the Ward's method was used to address the final research question to determine if any distinct groups existed among the Oklahoma City workforce participants based on their self-identified behavior/personality type. The Ward's method was selected as the linkage method for forming the clusters because:

> This method is designed to optimize the minimum variance within cluster. This objective function is also known as the within-groups sum of squares or the error sum of squares (ESS)… The method works by joining those groups or cases that result in the minimum increase in the ESS. The method tends to find (or create) clusters of relatively equal sizes and shapes as hyperspheres. (Aldenderfer & Blashfield, 1984, p. 43)

In order to run the cluster analysis, new variables had to be created for each of the 28 DiSC assessment items. Each DiSC item consists of a group of four words. For each of the group of four words for an assessment item, one is selected as the "most", one word is selected as the "least", and two are not selected. Therefore, two dichotomous variables were created for each word. One set was for the "most" items and the other was for the "least" items. Each set had 112 (28 x 4 = 112) items. Items that were selected were coded as a one, and those that were not were coded as a zero.

All 224 DiSC variables were used in executing the first cluster analysis. This analysis indicated that the variables that separated each of the clusters were the “least” variables. Since this study was interested in how individuals identified who they were rather than who they were not, a second cluster analysis was executed using only the 112 “most” variables.

The second cluster analysis indicated that the most appropriate solution for describing the Oklahoma City workforce participants in this study was a 3-cluster solution. Figure 29 illustrates the distribution of the clusters at the 2-, 3-, and 4-cluster levels. At the 4-cluster solution, various size groups exist, and the smallest group of 26 and mid-sized group of 47 already exist. In the 3-cluster level, the groups of 17 and 34 combine to create the largest group of 51. If the groups were consolidated one more time, the large and mid-sized groups would combine to create a disproportionably large group of 98. Thus, because the groups were most equally divided, the 3-cluster solution (26, 47, and 51 participants) was selected as the best clustering solution for this data set.

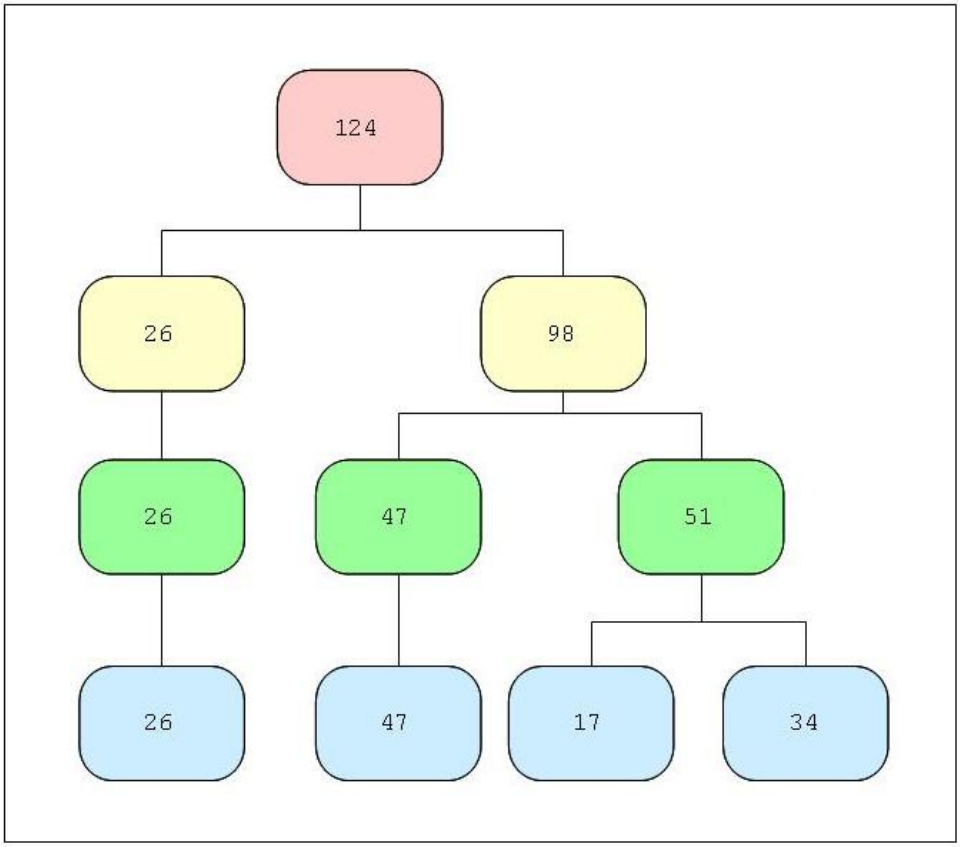

Figure 29. Cluster Formation for Work-Related Roles.

Discriminant Analysis

While cluster analysis can be used to uncover naturally-occurring groups, it does not identify what separates the groups and gives them their special characteristics. Discriminant analysis can be used for "identifying the process that separates the clusters and therefore for helping to describe the clusters" (Conti, 1996, p. 71). For this analysis, the clusters are used as the grouping variable, and the same variables that are used in the cluster analysis are used as the discriminating variables. Since three clusters were identified as a result of the cluster analysis, discriminant analyses were needed at the 2-cluster level and the 3-cluster level in order to properly identify the process separating the groups. The first discriminant analysis used the clusters of 98 and 26 from the 2-cluster

level of the cluster analysis (see Figure 29) that utilized the 112 “most” variables from DiSC as the discriminating variables. The discriminant function from this analysis was 100% accurate in classifying the participants into the two clusters of 98 and 26 (see Table 22), in their correct groups. However, the “structure matrix which describes the process that separates the various clusters into distinct groups” (Conti, 1996, p. 71) was not clear. The structure matrix contained correlations for each individual item in the analysis with the discriminant function, and these were all low (see Table 23). Because these correlations were low and because the differences among the top variables were small, it was not possible to determine from this analysis which variables should be used in naming the process that separated the two groups. Therefore, a second discriminant analysis was conducted to seek greater clarity in the structure matrix which in turn would provide a better understanding of the process that separated the two groups.

Table 22. Discriminate Function Classification Results for 2-Cluster Level

	Predicted Group Membership		
Cluster	1	2	Total
1	98	0	98
2	0	26	26
1	100.0%	0.0%	100.0%
2	0.0%	100.0%	100.0%

Table 23. Highest 18 Correlations in Structure Matrix for Discriminant Analysis for 2-Cluster Level

Variable	Correlation
Submissive	.211
Confident	-.153
Obedient	.146
Reserved	.141
Sympathetic	.132
Conscientious	.128
Diplomatic	.121
Independent	-.121
Compliant	.120
Amiable	.116
Enthusiastic	-.106
Direct	.101
Expressive	-.098
Lenient	.096
Sociable	-.095
Outgoing	-.092
Strong-willed	-.092
Aggressive	-.090

When a large number of discriminating variables are used in a discriminant analysis, there are many sources of potential variance, and as a result, correlations may be low for many variables in the structure matrix. Fritz (2008) has demonstrated that the elimination of many of the variables which are accounting for only a limited amount of variance and using a few of the items in the structure matrix with the highest correlations can produce both (a) discriminant functions that are highly accurate in classifying the participants in their correct groups and (b) a structure matrix that can be easily interpreted (pp. 110-116). Because 112 variables were used in this discriminant analysis, some of the variance in the analysis was attributed to items that were not important in discriminating between the two groups. To better identify the variables that had a primary impact on discriminating between the two groups, a second discriminant analysis was run. Utilizing the data from the first discriminant analysis as an exploratory probe of the

data (p. 112), it was determined that the second discriminant analysis would use the 12 DiSC variables with a correlation above .1 (see Table 23). The discriminant function from this analysis was 91.1% accurate (see Table 24) in classifying the participants into their correct groups. Thus, although some accuracy was lost in the second discriminant analysis, the exploratory process of running a series of discriminant analyses and using the structure matrix from each to remove variables that were not contributing to discriminating between the clusters produced a structure analysis that was useful in identifying and naming the process that separated the two groups. The structure matrix for this analysis had nine items with a correlation above 0.3 (see Table 25). These nine items were used for naming the process that separated the first two groups of Oklahoma workforce participants.

Table 24. Discriminate Function Classification Results for Discriminant Analysis at 2-Cluster Level Using 12 Discriminating Variables

	Predicted Group Membership		
Cluster	1	2	Total
1	87	11	98
2	0	26	26
1	88.8%	11.2%	100.0%
2	0.0%	100.0%	100.0%

Table 25. Group Means for Highest Items in Structure Matrix for Discriminant Analysis at 2-Cluster Level Using 12 Discriminating Variables

Variable	Correlation	Group Mean	
		Group of 98	Group of 26
Confident	-.436	**.62**	.08
Obedient	.415	.23	**.73**
Sympathetic	.377	.38	**.50**
Conscientious	.364	.38	**.85**
Diplomatic	.345	.23	**.65**
Independent	-.345	**.52**	.08
Compliant	.343	.27	**.69**
Amiable	.330	.38	**.81**
Enthusiastic	-.302	**.51**	.12

The group means were used to identify the group differences in the process that separates the clusters. In naming this process that separated the two groups, the direction of the variables associated with the two groups was used to determine the underlying concept represented by the two groups. The variables with a negative correlation indicated the characteristics of Group 1 *(n*=98) while those with a positive correlation represented the characteristics of Group 2 *(n*=26). The variables Confident, Independent, and Enthusiastic (see Table 25) in Group 1 interact in a way that could describe a leader or a leadership role. The variables of Obedient, Sympathetic, Conscientious, Diplomatic, Compliant, and Amiable (see Table 25) in Group 2 interact in a way that could describe a contributing team member or membership role. The underlying concept or process that separates a leadership role from a membership role can be thought of as participants' view their work-related role. Thus, the first two groups were construed to be split on the type of work-related role the participant preferred: (a) Leadership Role or (b) Membership Role.

At the 3-cluster level, the cluster of 98 divided into groups of 51 and 47, while the cluster of 26 remained intact. In order to determine the process that separates the two Leadership Role groups, a discriminant analysis was run using the groups of 51 and 47 as the discriminating groups and the 112 “most” variables from the DiSC as the discriminating variables. The discriminant function from this first analysis was 100% accurate in classifying the participants into two clusters of 47 and 51 (see Table 26). However, like the first analysis at the 2-cluster level, the structure matrix was not clear (see Table 27). Because these correlations were low and because the differences among the top variables were small, it was not possible to determine, from this analysis, which variables should be used in naming the process that separated these two Leadership Role groups. Therefore, a second discriminant analysis was again conducted to seek greater clarity in the structure matrix which in turn would provide a better understanding of the process that separated the two groups.

Table 26. Discriminate Function Classification Results for first Leadership Role Division

	Predicted Group Membership		
Cluster	1	2	Total
1	47	0	47
2	0	51	51
1	100.0%	0.00%	100.0%
2	0.0%	100.0%	100.0%

Table 27. Highest 18 Correlations in Structure Matrix for Leadership Role Group

Variable	Correlation
Friendly	-.143
Moderate	.099
Outspoken	.091
Direct	.091
Independent	.081
Restless	.069
Kind	-.067
Logical	.066
Demanding	.064
Attractive	-.063
Insistent	.061
Cheerful	-.059
Sociable	-.059
Charming	.055
Stubborn	.055
Accurate	.053
Captivating	-.053
Self-reliant	.051

Utilizing the data from the first discriminant analysis on the Leadership Roles group as an exploratory probe of the data, the second discriminant analysis in this series used the top 10 DiSC variables (see Table 27). The discriminant function from this analysis was 91.8% accurate (see Table 28) in classifying the participants into their correct groups. Thus, although some accuracy was lost in the second discriminant analysis, the exploratory process of running a series of discriminant analyses and using the structure matrix from each to remove variables that were not contributing to discriminating between the groups again produced a structure analysis that was useful in identifying and naming the process that separated the two Leadership Role groups. The

structure matrix for this analysis had five items with a correlation above 0.3 (see Table 29). These items were used for naming the process that separated the two groups in the Leadership Role.

Table 28. Discriminate Function Classification Results for the Second Leadership Role Division

	Predicted Group Membership		
Cluster	1	2	Total
1	45	2	47
2	6	45	51
1	95.7%	4.3%	100.0%
2	11.8%	88.2%	100.0%

Table 29. Structure Matrix Used in Naming the Two Leadership Role Groups

		Group Mean	
Variable	**Correlation**	**Group of 47**	**Group of 51**
Friendly	-.583	**.89**	.25
Moderate	.402	.00	**.41**
Outspoken	.371	.00	**.37**
Direct	.368	.11	**.55**
Independent	.329	.04	**.73**

The group means were used to identify the group differences in the process that separates the clusters. In naming this process that separates the two groups, the direction of the variables associated with the two groups was used to determine the underlying concept represented by the two groups. The variables with a negative correlation indicated the characteristics of Group 1 (47) while those with a positive correlation represented the characteristics of Group 2 (51). The variable Friendly in Group 1 (see Table 29) might describe a leader who leads from the Affective Domain, or the heart. The variables of Moderate, Outspoken, Direct and Independent (See Table 29) might describe a leader who leads from the Cognitive Domain, or the head. The underlying concept or

process that separates the two leadership roles could be the participants' view on how decisions should be made. Thus, the second two groups were perceived to be split on where leadership should stem from the: (a) Cognitive Domain – head, or (b) Affective Domain – heart.

Figure 30 illustrates the process that was proposed to separate the 124 participants into three clusters based on their DiSC responses. A basic division in the groups was whether a participant prefers to lead people or to be a team member. Those who prefer to lead people divided on whether they preferred to lead based on facts or on feelings. For those depending on facts, leadership may come from the Cognitive Domain or the head. For those depending on feelings, leadership may come from the Affective Domain or the heart. Thus, the three clusters can be named Leading from Head, Leading from the Heart, and Contributing Team member.

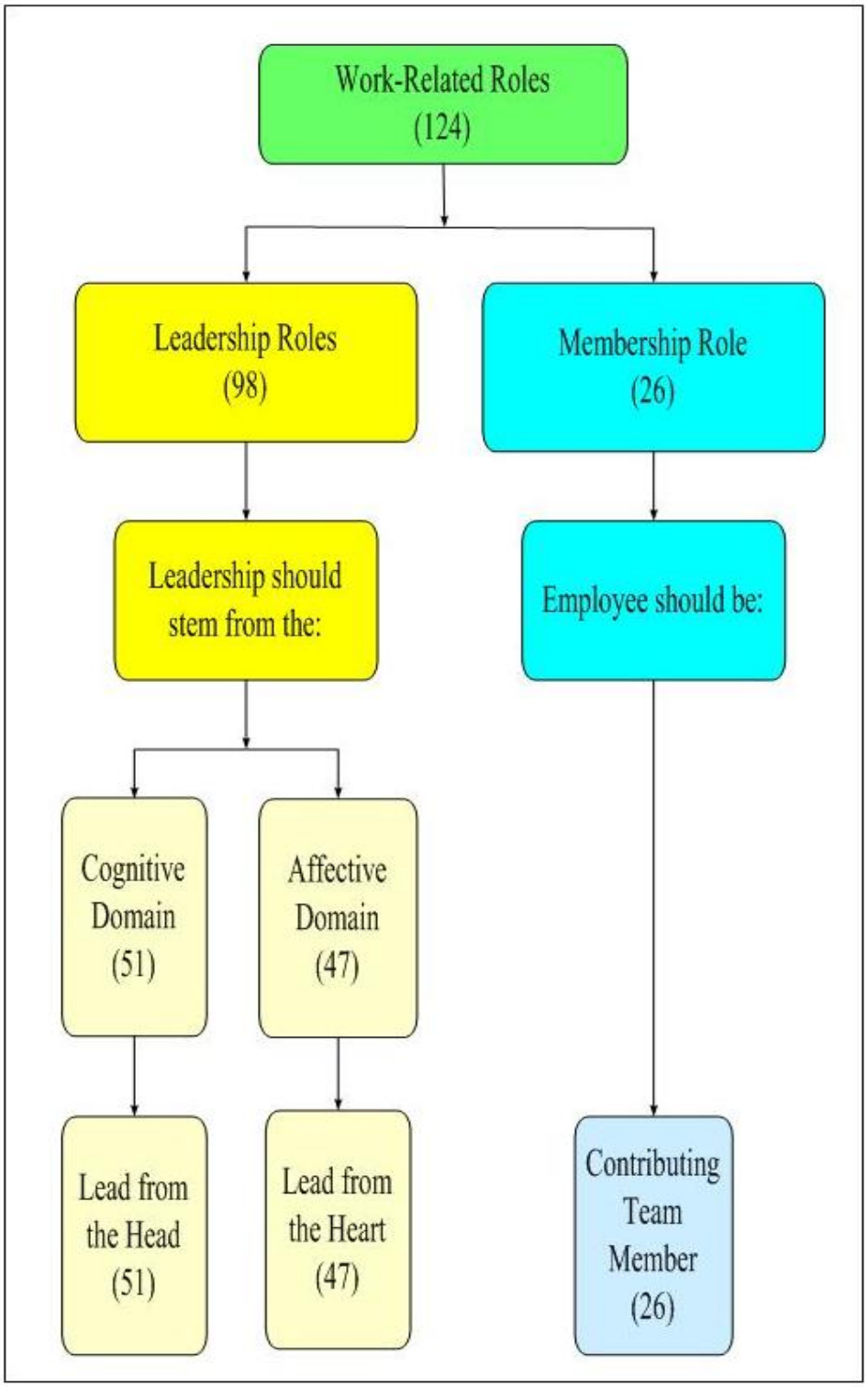

Figure 30. Processes that Separate Groups at 2-Cluster and 3-Cluster Solution Levels.

Relationships of Clusters to Other Variables

A series of chi-square analyses were conducted to examine the relationships of the identified clusters to the other variables in the study. These variables were grouped as follows:

- Age--Traditionalist birth years (1925-1942), Baby Boomer birth years (1943-1960), Generation X birth years (1960-1981), and Millennial birth years (1982-2003)
- Gender--Female and Male
- Management--Non-management, Supervisor/Front-line Manager, Mid-level Manager, and Senior/Executive Manager
- Ethnicity--Caucasians represented the largest percentage of the seven groups, 75.00%. To facilitate analysis, the remaining six groups were consolidated in to one group to explore for potentially statistically significant relationships. The groups were labeled as White and Non-White
- Education--The eight categories of education were consolidated into the following four broader categories to facilitate analysis:
    - High School--Less than High School Diploma, General Education Diploma, and High School Diploma
    - Some College--Vocational Education Certificate, Some College, and Associate Degree
    - Bachelors Degree-- remained a single category due to original group size
    - Advanced Degree--Masters Degree and PhD/Professional Degree
- Industry--Information, Financial, Manufacturing

- ATLAS--Engager, Navigator, Problem Solver

There were no statistically significant relationships with the identified clusters for any of the variables except for education (see Table 30).

Table 30. Chi-square Values for Clusters by Other Variables

Demographic Variable	***χ2***	***df***	***p***
Age	7.401	4	0.116
Gender	1.779	2	0.411
Management level	8.936	6	0.177
Ethnicity	1.417	2	0.492
Education	17.120	6	0.009
Industry	5.326	4	0.255
ATLAS	5.727	4	0.220

Age. In the Baby Boomer generation (see Figure 31), over half, 56.52% *(n*=13), of the participants were Cognitive Leaders; approximately one-third, 30.43% *(n*=7), were Affective Leaders; and less than one-fifth, 13.04% *(n*=3), were Team Members. In Generation X, 39.33% *(n*=35) of the participants were identified as Cognitive Leaders, 35.96% *(n*=32) were identified as Affective Leaders, and 24.72% *(n*=22) were identified as Team Members. The Millennial group was identified as two-thirds, 66.67% *(n*=8), Affective Leaders; one-fourth, 25.00% *(n*=3) Cognitive Leaders, and less than one-tenth, 8.33% *(n*=1), as Team Members.

The distribution of clusters across the generational age groups was not significantly different from what was expected by chance (χ^2 = 7.401; *df* = 4; *p* = .116 – see Table 30).

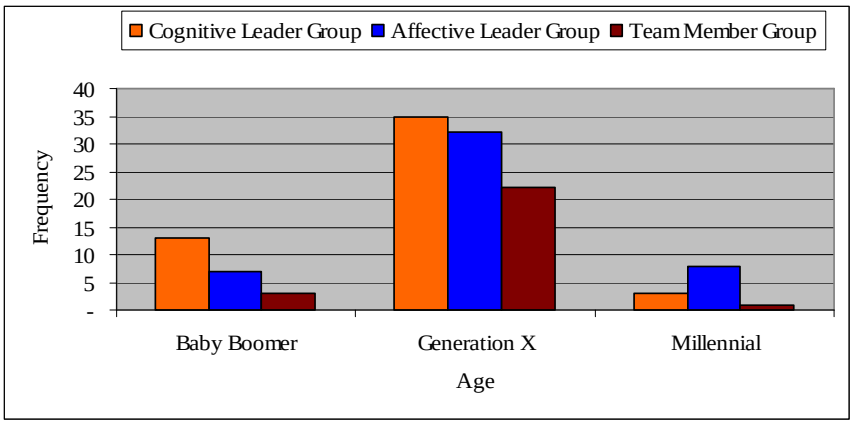

Figure 31. Work Related Role Clusters within Age demographic.

Gender. The female group was nearly evenly divided evenly between the three clusters (see Figure 32). Cognitive Leaders were the largest group and represented approximately two-fifths, 41.10% (*n*=30), of the participants; followed next by Affective Leaders with 34.25% (*n*=25); and Team Members with 24.66% (*n*=18) of the female participants. The male group had a larger number of participants in two groups, over three-fourths (84.32%) in two of the three groups. Each of two groups accounted for two-fifths of the total group: Affective Leaders--43.14% (*n*=22) and Cognitive Leaders--41.18% (*n*=21). The third Team Member group was considerably smaller and accounted for the remaining 15.69% (*n*=8) of the male participants.

The distribution of clusters across the gender groups was not significantly different from what was expected by chance (χ^2 = 1.779; *df* = 2; *p* = .411 – see Table 30).

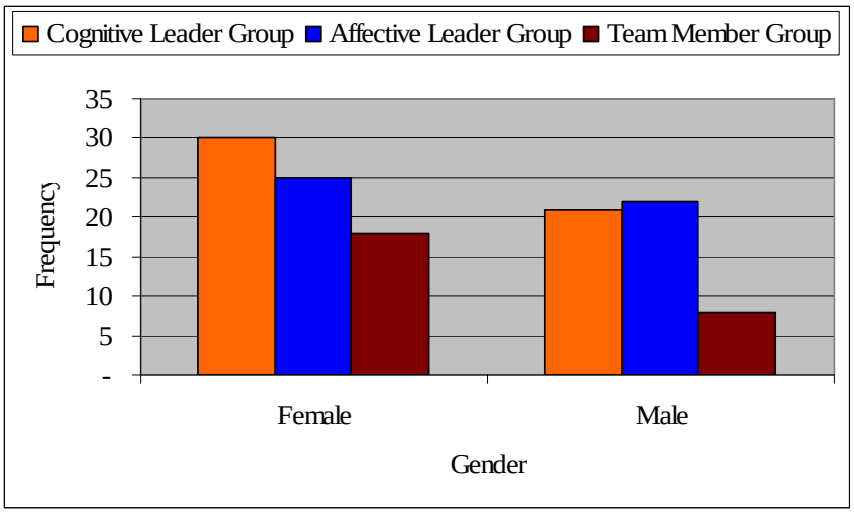

Figure 32. Work Related Role Clusters within Gender demographic.

Management. The Non-management group had a larger number of participants, over three-fourths (80.46%), in two of the three groups (see Figure 33). Each of two groups accounted for two-fifths of the total group: Affective Leaders--41.38% (*n*=36) and Cognitive Leaders--39.08% (*n*=34). The third Team Member group was approximately half the size of the first two groups and accounted for the remaining 19.54% (*n*=17) of the Non-management participants. The Supervisor/Front-line manger group indicated over half, 57.89% (*n*=11), of the participants identified as Cognitive Leaders; approximately one-third, 31.58% (*n*=6), as Affective Leaders; and one-tenth, 10.53% (*n*=2), as Team Members.

The Mid-level manager group had a larger number of participants, over two-thirds (71.42%), in two of the three groups. Each of two groups accounted for over one-third of the total group: Team Members--35.71% (*n*=5) and Cognitive Leaders--35.71% (*n*=5). The Affective Leader group accounted for the remaining 28.58% (*n*=4) of the Mid-level managers. The Senior/Executive manager group reflected two-thirds, 66.67% (*n*=2) of the participants identified as Team Members and one-third, 33.33% (*n*=1) as Cognitive

Leaders. The management group had no participants who identified with the Affective Leader style.

The distribution of clusters across the management level groups was not significantly different from what was expected by chance (χ^2 = 8.936; *df* = 6; *p* = .177 – see Table 30).

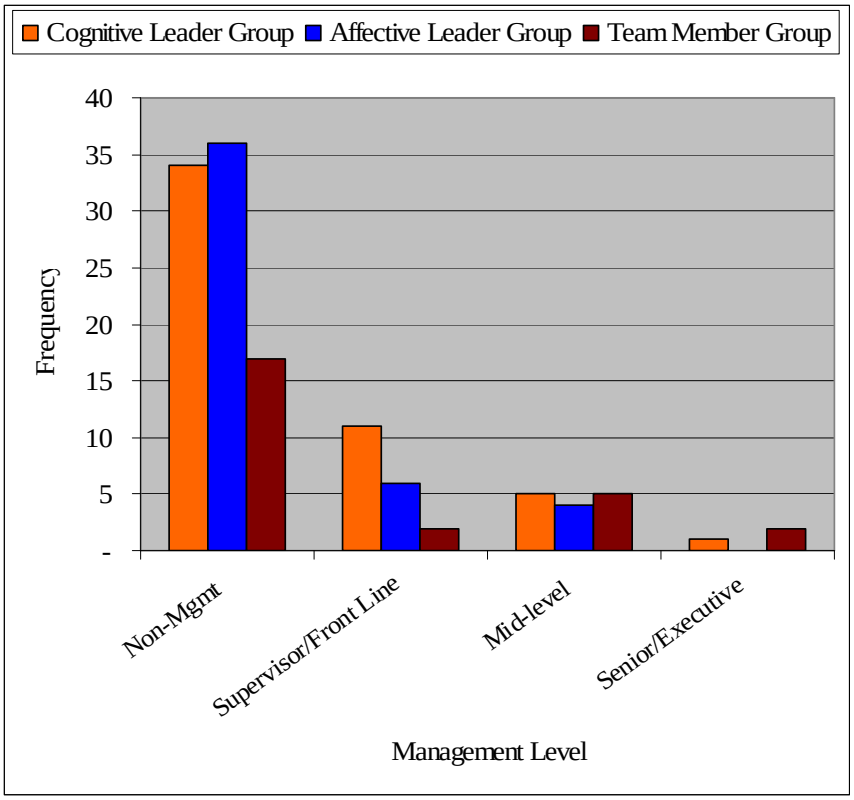

Figure 33. Work Related Role Clusters within Management demographic.

Ethnicity. The White group was nearly divided evenly between the three Ward Cluster groups (see Figure 34): Cognitive Leaders were the largest group and represented over two-fifths, 44.09% (*n*=41), of the participants. Affective Leaders represented one-third, 35.48% (*n*=33), of the participants and Team Members represented the remaining one-fifth, 20.43% (*n*=19), of the participants.

The Non-White group had a larger number of participants, over three-fourths (72.04%) in the two Leadership groups. The Affective Leader group was the largest, 45.16% (*n*=14), followed by the Cognitive Leader group, 32.26% (*n*=10). The Team Member group was half the size of the Affective Leader group, 22.58% (*n*=7), and accounted for the remaining participants.

The distribution of DiSC patterns across the ethnic groups was not significantly different from what was expected by chance (χ^2 = 1.417; *df* = 2; *p* = .492 – see Table 30).

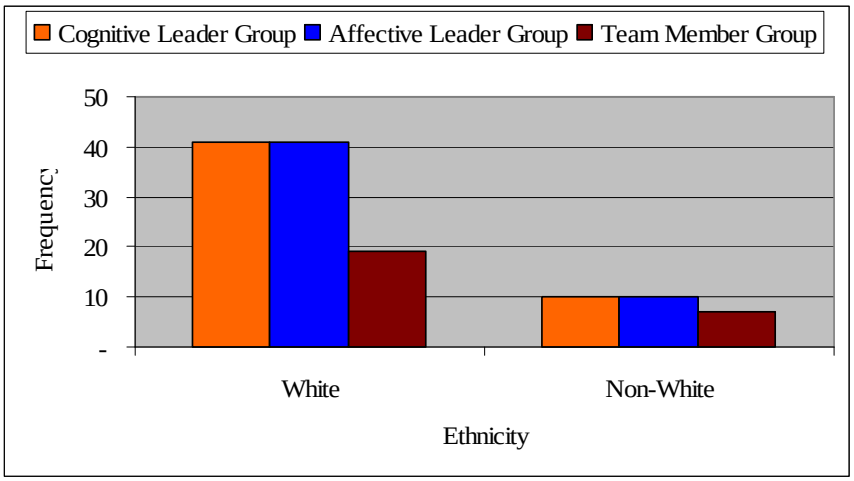

Figure 34. Work Related Role Clusters within Ethnicity demographic.

Education. The High School group (see Figure 35) was identified as approximately two-fifths, 42.86% (*n*=12), Affective Leaders; one-fourth, 25.00% (*n*=7), Cognitive Leaders; and approximately one-third, 32.14% (*n*=9), Team Members. The Some College group was identified as over half, 53.06% (*n*=26), Affective Leaders; Approximately one-third, 34.69% (*n*=17), Cognitive Leaders; and less than one-fifth, 12.25% (*n*=6), Team Members. The Bachelors Degree group was identified as over half, 58.82% (*n*=20), Cognitive Leaders; approximately one-fourth, 26.47% (*n*=9), Team Members; and less than one-fifth, 14.71% (*n*=5), Affective Leaders. The Advanced

Degree group was half, 50.00% (*n*=6), Cognitive Leaders; one-third, 33.33% (*n*=4), Affective Leaders; and less than one-fifth, 16.67% (*n*=2), Team Members.

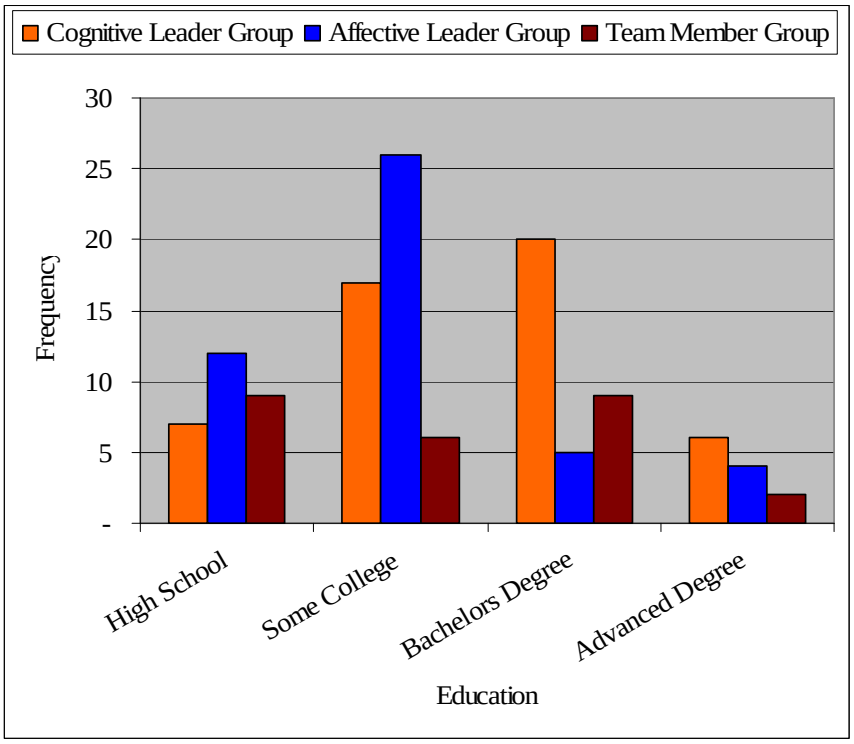

Figure 35. Work Related Role Clusters within Education demographic.

The distribution of clusters across the education groups was significantly different from what was expected by chance (χ^2 = 17.120; *df* = 6; *p* = .009 – see Table 30) and suggests a trend that warrants further research and analysis.

Table 31. Adjusted Standardized Residuals of Work Related Role Clusters within Education demographic

	Work Related Role Clusters						
	Cognitive Leadership		Affective Leadership		Team Member		
Educational Levels	**Freq**	**AR**	**Freq**	**AR**	**Freq**	**AR**	**Total**
High School	7	-1.9	12	0.6	9	1.6	**28**
Some College	17	-1.1	26	2.8	6	-2.0	**49**
4-year Degree	20	2.5	5	-3.3	9	0.9	**34**
Advanced Degree	6	0.7	4	-0.4	2	-0.4	**12**
Total	**50**		**47**		**26**		**123**

The significant chi-squares indicated that the groups are not independent of each other based on education. The participants in the Affective Leader group (see Table 31) are very high (2.8) in the Some College area but almost equally low (-3.3) in the 4-year Degree area. They are about normal or zero in the High School and Advanced Degree areas. Thus, part of the significant difference in the distribution of people by cluster among the education groups is that the Affective Leader group is primarily a group that has gotten some college training but its members have not earned a four-year degree.

The participants in the Cognitive Leader group (see Table 31) are high (2.5) on having a 4-year Degree and slightly elevated (.7) on Advanced Degrees. The Cognitive Leader group is also low in both the Some College (-1.1) and the High School (-1.9) areas. Thus, the predominance in this group is on having the college degree.

The Team Member group has a disproportionably large number of members in the High School (see Table 31). Thus, the lowest educational level in the study is associated with being a team player as opposed to playing a leadership role.

In summary, the three cluster groups are not independent of each other based on education because the Affective Leader group has a special training emphasis that does not require a four-year degree while the Cognitive Leader group has an emphasis of people who do have a four-year advanced degree and those who prefer to be Team Members tend to have a High School diploma, its equivalency, or less.

Industry. The Information Industry (see Figure 36), Cox Communications Incorporated, had a larger number of participants, over three-fourths (80%) in the two Leadership groups. The Cognitive Leader group was the largest, 42.00% *(n*=21), followed by the Affective Leader group, 38.00% *(n*=19). The Team Member group was

approximately half the size of the Cognitive Leader group, 20.00% (*n*=10), and accounted for the remaining participants. The Financial Industry, American-Fidelity Group Assurance was evenly distributed over the three groups: Cognitive Leader group 32.56% (*n*=14), Affective Leader group 37.21% (*n*=16), and Team Member group 30.23% (*n*=13). The Manufacturing Industry, Great Plains Coca-Cola Bottling Company, had over half, 51.61% (*n*=16) participants in the Affective Leader group and approximately one-third, 31.71% (*n*=12) participants in the Cognitive Leader group. The Team Member group was approximately one-fifth the size of the Affective Leader group, 9.68% (*n*=3), and accounted for the remaining participants.

The distribution of clusters across the industry groups was not significantly different from what was expected by chance (χ^2 = 5.326; *df* = 4; *p* = .255 – see Table 30).

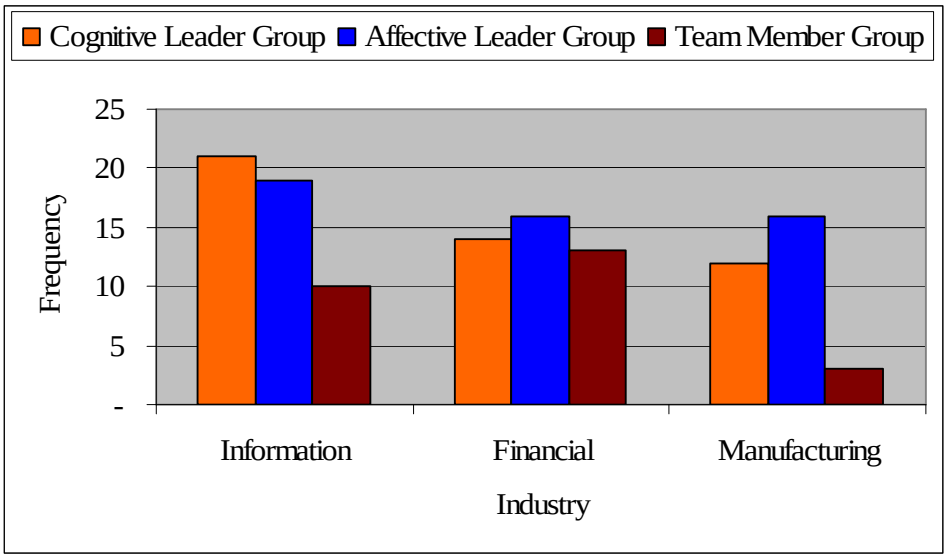

Figure 36. Work Related Role Clusters within Industry demographic.

ATLAS. The Engager group had a larger number of participants in two groups, over three-fourths, (82%) in two of the three groups (see Figure 37). Each of two groups accounted for approximately two-fifths of the total group: Cognitive Leader group--

38.00% (*n*=19) and Affective Leader group--44.44% (*n*=22). The third group was dramatically smaller and accounted for the remaining one-fifth of the group: Team Member group--18.00% (*n*=9).

The Problem Solver group had approximately half, 47.50% (*n*=19), in the Cognitive Leader group and split by a narrow margin between the Affective Leader group, 27.50% (*n*=11), and Team Member group, 25.00% (*n*=10). The Navigator group had over half, 52.94% (*n*=1), in the Affective Leader group. The Cognitive Leader group was approximately one-fourth, 26.47% (*n*=9), of the group and Team Member group, 20.59% (*n*=7), made up the remaining one-fifth of this group.

The distribution of DiSC patterns across the ATLAS groups was not significantly different from what was expected by chance norms (χ^2 = 5.727; *df* = 4; *p* = .220 – see Table 30).

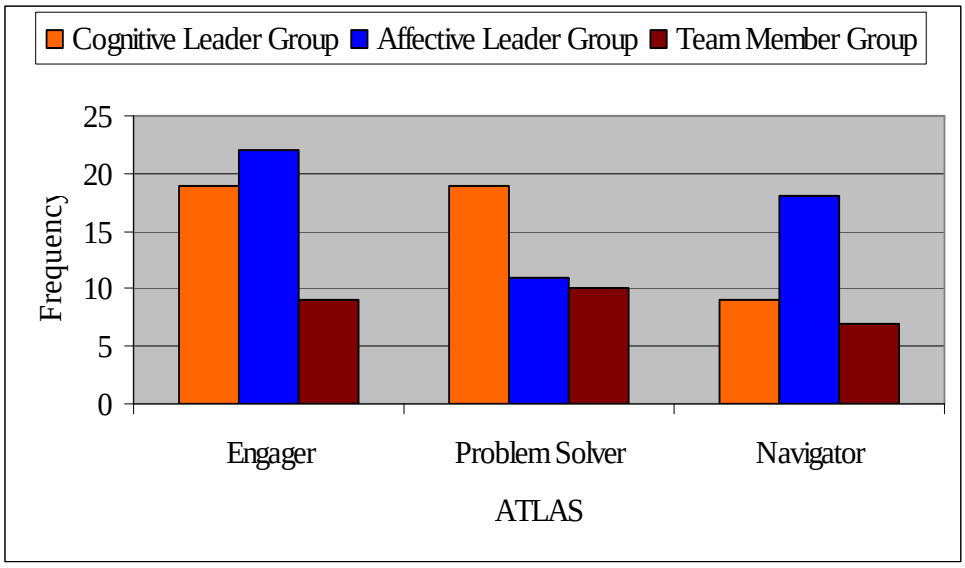

Figure 37. Work Related Role Clusters within ATLAS.

CHAPTER 5

SUMMARY, FINDINGS, CONCLUSIONS AND RECOMENDATIONS

Introduction

The business world is one that is constantly changing and this change can be a bothersome event. Borders no longer restrict or confine businesses, industries, or people. As societies become more global, so does the need for each individual in the workforce to become more effective. As a whole, industrial and corporate organizations are faced with two defining challenges and changes: attraction and retention of high-quality associates. It is estimated that currently over 17% of the U.S. workforce is comprised of the Traditionalist and Baby Boomer generations and that many of these individuals are deciding that it is time to leave the workforce (Grantham, Ware, & Williamson, 2007). As these individuals are resigning, their vacated positions are being filled by younger workers from Strauss' Generation X and the Millennial generations (Strauss, 1991).

This cycle of individuals rotating in and out of the workforce is nothing new. However, what is concerning is the amount of knowledge that the Traditionalist and Baby Boomer generations possess and are taking with them when they leave and the vacancy of knowledge this is creating for the industrial and corporate organizations that remain in operation. In addition to those who are preparing to retire from the workforce, it is also asserted there is another segment of the population known as *migrating workers* who are also creating knowledge voids in the workplace. Research has found that approximately

40% of this migrating population has indicated they are interested in seeking new job opportunities within the coming year (Grantham, Ware, & Williamson, 2007).

While retiring and migrating workers do create some substantial obstacles for organizations to overcome, they also present substantial issues that are directly related to the hiring, training and development of personnel. With many individuals planning on retiring from the workforce, associate migration, and organizational expansion, corporate hiring personnel are scrambling to employ or promote individuals who possess the desired skill sets, who "fit" in the organization or within a specific level of the organization, and who possess a required level of growth potential.

At first this may appear to require an insurmountable amount of information to be collected from a would-be associate or an existing associate looking to be promoted. However, hiring personnel have many different types of instruments available to them that can extract appropriate information about associates relatively quickly. Four of the most commonly used instruments include: (1) *Hogan Personality Assessments*, (2) *Keirsey Temperament and Character Sorter*, (3) *Myers-Briggs Type Indicator*, and (4) *DiSC Personal Profile System 2800 Series*.

In contrast to these behavior and personality instruments which corporate hiring personnel have frequently used to expedite the hiring and promoting process, training and development personnel (instructors) have not typically used any instruments that specifically assess an individual's preferred learning strategy. Given an absence of appropriate assessment data, an instructor has three options available in order to evaluate how an individual prefers to learn. The first option is to utilize the results from one of the human behavior and personality instruments used for extending a job offer and assume

that an individual's preferred learning strategy and behavior and personality traits are closely related. The second option is to observe how an individual goes about learning while in the classroom. The last option available to an instructor is to ask individuals how they prefer to learn a new task or information. While no assessment of behavior, personality, or learning preference is perfect, it seems likely that the combination of two specific assessments – one that assesses human behavior or personality, and one that assesses learning strategies – could very well provide a powerful compilation of data that could be used by an instructor to ensure that the needs of each learner are met; thereby establishing a more effective individual workforce. This supposition of the positive potential of assessment tools to help understand self and others was the core principle of instrumented learning theory, which formed a guiding impetus for this study.

Overview of the Study

Current literature (Carroll, 2003; Geier Learning International, 2003; Hogan et al., 2007; Keirsey, 2007) suggests that assessing an individual's behavior profile is a necessary step for determining whether or not one may be best suited for a particular job within an organization. However, understanding how an individual prefers to learn new material also needs to be taken into consideration and utilized in conjunction with each individual's behavioral profile if training instructors and organization leaders want to ensure that newly hired or promoted associates are in fact learning the necessary skills to perform on the job.

Hiring personnel in industrial and corporate organizations in the United States are currently utilizing instruments such as *DiSC Personal Profile System 2800 Series, Hogan Personality Assessments, Myers-Briggs Type Indicator* and, *Keirsey Temperament and*

Character Sorter that assess an individual's behaviors to: (a) determine whether or not to extend a job offer for new employment, or (b) determine whether or not to extend an offer of promotion to an existing associate. However, lack of evidence in the current literature suggests that industrial and corporate hiring and training professionals are not using tools that specifically assess an individual's learning strategy.

The problem with current organization practices is that hiring and training personnel are currently only addressing one of the learner's two major categories of needs, i.e. behavioral needs addressed within traditional needs-based theory; needs of the second category, adult learning theory, are not being assessed to determine the learner's preferred learning strategy. Since these learning instruments assess different types of internal needs, failure to determine both the learner's behavioral *and* learning needs, may lead hiring and training professionals to overlook a very important combination of tools that could be valuable in assisting them in instructing and developing the whole associate, ultimately increasing individual workforce effectiveness.

The purpose of this study was to describe the behavior/personality and learning strategy profile and relationships of individuals in the corporate workforce. The insights obtained from combining and interrelating these two concepts may help maximize individuals' over-all level of job knowledge, productivity, retention, and ultimately individual workforce effectiveness through the meeting of their needs in both the behavioral and learning domains.

The construct of needs-driven behavior or personality was measured with the *DiSC Personal Profiles System 2800 Series*, also known as the DiSC Classic. The construct of preferred learning strategy was measured with ATLAS. In addition, data

were collected on the demographic variables of age, gender management level, ethnicity, education and industry.

This study was descriptive in nature and used a self-report questionnaire methodology. A questionnaire was selected as the preferred type of data collection tool for this study because of the need to reach a large quantity of participants at multiple locations in a timely manner and at a minimum expense for the volume of data to be collected. The questionnaire consisted of three sections: (1) the *DiSC Classic Personal Profile System 2800 Series* instrument (DiSC), (2) ***A****ssessing* ***T****he* ***L****earning Strategies of* ***A****dult****S*** (ATLAS), and (3) demographic information.

The population for this study consisted of individuals working in financial, information, and manufacturing organizations in Oklahoma City, Oklahoma; no preference was given to the management or non-management level associates. The sample for this study consisted of 124 individuals from the three organizational areas of finance (represented by American-Fidelity Assurance Group), information (represented by Cox Communication), and manufacturing (represented by Great Plains Coca-Cola). This study utilized convenience cluster sampling where cluster represented industry sectors. These businesses were selected because: (a) the researcher had connections within each organization, (b) the researcher obtained consent from each organization to participate in the study, (c) the organizations represented a mix of industries, (d) the organizations represented large sectors of Oklahoma City and Oklahoma industry and (e) The researcher has a working knowledge of each industry; he has worked in the financial industry for 13 years, he worked for Cox Communications Inc. for 3 years, and he currently works for Great Plains Coca-Cola Bottling Company. During May 2008, the

researcher met with the three organizations that participated in the study and collected information regarding their associates' demographics and their DiSC and ATLAS profiles.

Five types of analysis were run on the data. First, descriptive statistics and crosstabs were used to profile the participants in relation to the demographic data, DiSC behavior, and ATLAS learning strategy preferences. Second, a one-way chi-square test was used to compare the learning strategy preferences of the participants to the norms of ATLAS. Third, a two-way chi-square test was used to examine relationships between behavior preferences and learning strategy preferences of the participants. Last, cluster and discriminant analysis techniques were used to identify the characteristics of any naturally occurring groups of individuals and to describe what differentiates among these groups, and a two-way chi square was used to examine relations between the Hierarchical-agglomerative, squared-Euclidean, Ward Clusters and the other variables.

Summary of Findings

A behavior/personality profile of the workforce participants was constructed to address the first research question in this study by using the data collected from the *DiSC Personal Profile System 2800 Series* section of the questionnaire. The responses in this study were distributed over 16 of the 18 Classical Profile Patterns, with the Undershift and Overshift patterns not represented among the participants. However, each of two groups made up approximately one-fifth of the total group: Perfectionist--21.77% *(n*=27) and Creative--20.16% *(n*=25). The other group was approximately half this size and made up about one-tenth of the sample: Inspirational at 10.48% *(n*=13). Two other pattern groups were found that were slightly smaller than the Inspirational group:

Results-Oriented--9.68% *(n*=12) and Counselor--7.26% *(n*=9). When these two groups were combined with the three groups making up over half of the sample, the new combined group contained over two-thirds (69.35%) of the sample.

A learning strategy profile was constructed to address the second research question in this study by using the data collected from the ***A****ssessing* ***T****he* ***L****earning Strategies of* ***A****dult****S*** (ATLAS) section of the questionnaire. The learning strategy preference profile for the 124 Oklahoma City workforce participants in this study consisted of: Engagers--40.32% *(n*=50), Problem Solver--32.26% *(n*=40), and Navigator--27.42% *(n*=34). A chi-square analysis was performed to compare the observed frequencies of the learning strategy preference distribution of the participants in this study to the expected preferred learning strategy frequency distribution as on the norms for ATLAS. The results were different from the ATLAS norms because the Engager group was larger (21.14%) than expected (31.8%) and the Navigator group was smaller (33.12%) than expected (36.5%). There were only slightly more (1.73%) Problem Solvers than expected (31.7%). The distribution of participants approached but did not quite reach the .05 significance level of difference with the established ATLAS norms (χ^2 = 5.646; *df* = 2; *p* = .059). The results of this study did not attain significance at the .05 level; however, they are very close to this level and therefore merit identification as a trend that warrants further investigation.

A series of DiSC and demographic crosstabs were calculated to address the third research question in this study using the data collected from the DiSC and Demographic sections of the survey questionnaire. The chi-square analyses for DiSC by demographic variables indicated a statistically significant relationship for DiSC by Age (χ^2 = 44.023;

df = 30; *p* = .047). Due to this finding, Adjusted Standardized Residuals were computed to determine which of the categories were major contributors to a significant chi-square; the significant chi-squares indicated that the groups were not independent of each other based on age. The participants in the Baby Boomer group were very high in the Achiever pattern but almost equally low in the Perfectionist pattern. The participants in the Generation X group were somewhat high in the Perfectionist Pattern but equally as low in the Promoter, Developer, Agent, and Achiever patterns. The Millennial group was extremely high in both the Promoter and Agent patterns with the Developer pattern approaching a high level of significance. The only pattern of this generation that was not a major contributor to the significant chi-square was the Creative pattern. The remaining 10 profiles did not play a role in the significant chi-square of this demographic.

A series of ATLAS and demographic crosstabs were calculated to address the fourth research question in this study using the data collected from the ATLAS and the demographic sections of the survey questionnaire. No significant relationships were found between ATLAS and any of the demographic variables except Industry. The participants in the Information group were very high in the Problem Solver learning strategy but were low in the Navigator learning strategy. The participants in the Financial group were somewhat low in the Problem Solver learning strategy but were about normal to zero in the Navigator learning strategy. The Manufacturing group was slightly elevated in the Navigator learning strategy and slightly lower in the Problem Solver learning strategy. The Engager learning strategy was close to expected frequency.

DiSC and ATLAS crosstabs were calculated and a chi-square analysis was generated to address the fifth research question in this study. The chi-square analysis did

not indicate any statistical relationships between the two variables of needs-driven behavior and preferred learning strategy.

Cluster, discriminant and chi-square analyses were used to address the sixth research question of identifying and describing naturally-occurring groups based on DiSC responses. The cluster analysis indicated that the most appropriate solution for describing the Oklahoma City workforce participants in this study was a 3-cluster solution. Since three clusters were identified as a result of the cluster analysis, discriminant analyses was used at the 2-cluster level and the 3-cluster level in order to properly identify the process separated the groups. Based on these analyses, the groups were named Cognitive Leaders, Affective Leaders, and Team Members.

The last finding for this question was discovered when a series of chi-square analyses were conducted to examine the relationships of the identified clusters to the other variables in the study. Significant differences were found between the groups and the demographic variable of education. The participants in the Affective Leader group were very high in the Some College area but almost low in the 4-year Degree area. The participants in the Cognitive Leader group were high on having a 4-year Degree and slightly elevated on Advanced Degrees. The Cognitive Leader group was also low in both the Some College and the High School areas. The Team Member group had a disproportionably large number of members in the High School area.

Conclusions

Based on the findings, the following conclusions were drawn:

1. DiSC and ATLAS may measure discrete and unique constructs.

2. The relationship between preferred learning strategy (ATLAS) and personality/behavior (DiSC) may be complex and may require further study to evaluate.
3. Individuals in the sampled industries showed strong preference for five of the DiSC Classic profiles, and DiSC pattern distribution may not be uniform across industries.
4. DiSC profiles may be related to age generations as defined by Strauss.
5. Preferred learning strategy may be related to industry in which employed; and learning strategy may not be uniform across industries.
6. There may be dissonance between workers' identified work roles and their preferred work roles.
7. Work roles and preferences may be related to level of education attained.

Discussion of Conclusions

Theory and Instrumentation: DiSC and ATLAS Relationships (Conclusions #1 and #2)

The theoretical framework for this study proposed that there was some overlap in what the *DiSC Personal Profile System 2800 Series* and ATLAS each assess; the findings indicated there was little overlap between the two instruments. This may have occurred for three different reasons: 1) incorrect or incomplete theory base, 2) deviant sample, or 3) each instrument was actually specifically designed to assess specific measures that are discrete and different from each other. It is not the opinion of the researcher that the

proposed theory and theoretical framework (see Figure 38) for this study were entirely incorrect. The theories behind each instrument are fundamentally sound. Rather, it is proposed that maybe room for modification in the area blending these two instruments to produce one ultimate result. Instead of trying to blend the results from each instrument, the theoretical model may need to be redesigned to indicate that the results of each instrument needs to be read *independently* in order to have a better understanding of self and others (see Figure 39).

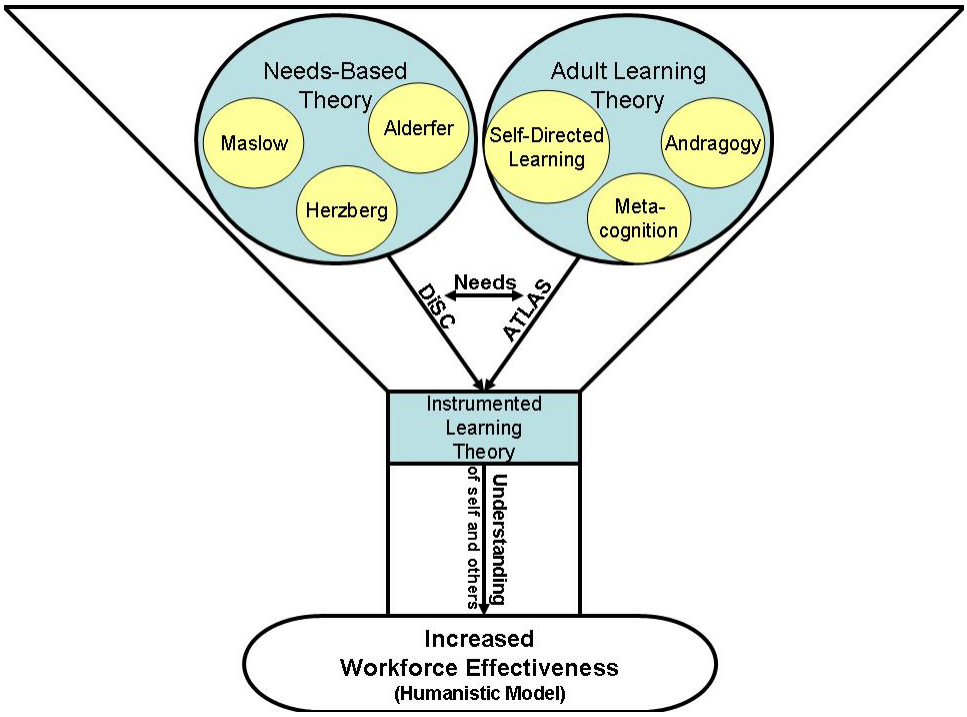

Figure 38. Original proposed theoretical framework for this study.

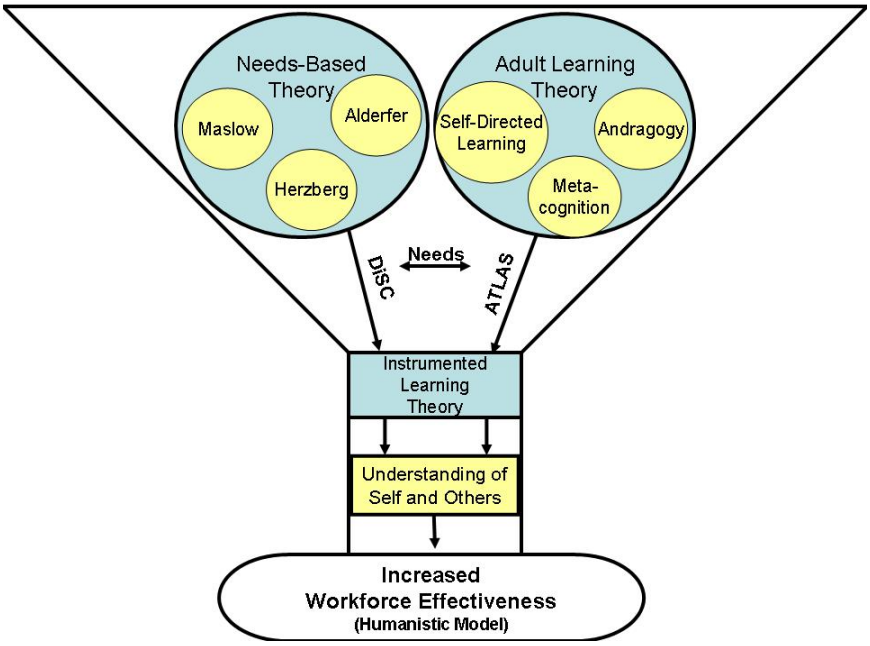

Figure 39. Possible revised theoretical framework.

A second explanation for the finding of no relationship between the constructs measures by DiSC and ATLAS may be found in the sample. First, there were only three industries sampled. Second each industry was not represented by the same number of participants. Third, while each participating organization did not submit demographic information on their respective industry, examination of the demographic information from Chapter 2 suggests it is reasonable to surmise that the age, gender, ethnicity, and education of the sample are not reflective of Oklahoma, Oklahoma County, or the United States. Had the sample been larger, included more organizations or contained a more balanced number of participants from the demographic variables, the findings may have been different.

The third explanation for the difference between the theory and the findings may lie in the instruments themselves. The developers of the *DiSC Personal Profile System 2800 Series* created an instrument that measures personalities that are focused on surface

traits (Inscape Publishing, 1996). The developers also report that out of the Big Five factors of personality prototypes (John, 1992), only three words are contained in the DiSC, [original (D), insightful (C), and logical (C)] (1996b) that are related to what Factor Five refers to as *intellect* or what others may refer to as *culture, flexibility, tough mindedness and openness to experiences* (1992). So while DiSC does contain three words that could be used to describe learning, it appears that the DiSC assessment may not specifically address an individual's willingness to learn. ***A****ssessing* ***T****he* ***L****earning Strategies of* ***A****dult****S*** (ATLAS) was created from a predecessor instrument, ***S****elf-* ***K****nowledge* ***I****nventory or* ***L****ifelong* ***L****earning* ***S****trategies* (SKILLS), which was specifically developed to measure five key areas of *learning* in the field of adult education: Metacognition, Metamotivation, Memory, Critical Thinking, and Resource Management, all of which would have come from the fifth factor of the Big Five, *intellect*.

In summary, it could be concluded that each of these two instruments was designed to measure very specific items. The *DiSC Personal Profile System 2800 Series* is designed to measure behavioral aspects of Dominance, Influence, Steadiness and Conscientiousness, while ***A****ssessing* ***T****he* ***L****earning Strategies of* ***A****dult****S*** (ATLAS) was designed to measure the five key areas of adult learning, and these are different constructs. If this is accurate, then the theoretical framework needs a revision (see Figure 39) to reflect a more accurate picture of how the two instruments should be used in conjunction with each other. This re-conceptualization posits that even if the sample was changed, the same findings would be found in future studies simply because of the fundamental nature and design of the two instruments. They measure different constructs that are discrete from each other. They provide two different sets of information about the

learners, both of which can be useful to workplace trainers to maximize workers' development.

An alternative conclusion also has merit, based on the theoretical foundations of the study and the nature of its instruments. Both DiSC and ATLAS assess aspects of basic *needs* within an individual. DiSC focuses on needs-driven behavior; that is, behavior that arises from basic internal needs. ATLAS addresses needs specifically related to learning. Because the two assessments both relate to an individual's internalized needs, there is logic in proposing that their outcomes may show similarities and relationships.

One conclusion from this study might be that it did not identify relationships between DiSC and ATLAS because of its choice of the specific data available from the two instruments and/or choice of data analysis techniques. Re-analysis of the study's data to examine such variables as the specific internal needs represented by various DiSC and ATLAS choices and inherent in clusters of DiSC profiles (such as all High-D profiles, etc.) may search more deeply into the constructs underlying DiSC and ATLAS and possible relationships between them. Consultation with an expert in the nuances and details of the DiSC instrument would be helpful in such a re-analysis.

DiSC Profile Patterns across Industries and Generations (Conclusions #3 and #4)

The distribution of the DiSC Personal Profile Patterns indicates that individuals in this study were concentrated in four of the 15 DiSC Classical Profile Patterns. The study's data suggested this preference could be related to two things: (a) age, or (b) industry. When exploring the age variable, as operationalized in this study as Strauss and Howe's generations, there is only one generation that really drives the distribution of the

behavior/personality patterns and that is Generation X. The observed preference for profiles emphasizing overcoming opposition to accomplish results and working conscientiously within existing circumstance to ensure quality and accuracy could have much to do with the attributes ascribed to Generation X by older generations. Strauss and Howe (1991), use words like lost, ruined, wasted, numb, dumb (p. 319) as words to describe Generation X. This generation has a higher level of divorced parents than any other in history, and they are less college educated (1991). With such low expectations for this generation, perhaps they feel they have something to overcome and prove to the prior generations. It could be hypothesized that Generation X is applying their knowledge and work ethics to avoid "living down" to the low expectations created by their parents and grandparents. Perhaps as this generation is growing older, they are realizing that they have to make the changes now for better tomorrow.

The second possible explanation for this specific profile distribution may be found by examining each industry. It is noteworthy that not only did the researcher meet with all of the participants in this study, he has also worked at two of the industries, Cox Communications and Great Plains Coca-Cola Bottling Company, and he has been active in all of the job function areas involved. American Fidelity-Group Assurance participants were all support staff personnel from the human resources department, Cox Communications participants primarily consisted of individuals who work in a call center environment (customer sales/service and technical support), and Great Plains Coca-Cola participants were all from the finance department. Based on this knowledge, it is understandable why the four DiSC Classical Profile Patterns of Perfectionist, Creative,

Results Orientated, and Inspirational, all of which have Dominance and/or Conscientiousness as the highest behavior variable, are predominant.

Regardless of the industry or department all four job descriptions would include the following role responsibilities: getting results, causing action, accepting challenges, making quick decisions, taking authority, solving problems, following policies and procedures, thinking analytically to weigh the pros and cons, being diplomatic with customers and peers, checking for accuracy, and critical analysis (Inscape Publishing, 2001). All of these descriptors can be found as traits or tendencies in the DiSC domains of Dominance or Conscientiousness.

In summary, age, as conceptualized in generations theory and expectation, may be a driving factor for this narrow and specific distribution of DiSC Classical Profile Patterns found in this study. A different, and perhaps stronger, explanation may reside in the industries, departments and job roles represented in this study. If other departments across all three participating organization were represented, there might be a more even distribution of the 15 DiSC Classical Profile Patterns.

Distribution of ATLAS and Learning Strategies across Industries (Conclusion #5)

The distribution of ATLAS is this study did not conform to the established ATLAS norms for the general population. The adjusted standardized residual (ASR) for the information industry participants indicated that the Navigator group was smaller than expected and the Problem Solver group was larger than expected. The financial industry group had fewer Problem Solvers than expected and the manufacturing industry group had more Navigators than expected. These differences may have more to do with actual job roles within each industry than the industry itself. The information industry was

represented largely by call center workers from Cox Communications Incorporated. These associates are largely concerned with generating alternative solutions and presenting those solutions to the customers. These associates do not have to make the final decisions; that responsibility is placed on the customer's shoulders. When a situation arises in which they cannot find a solution or make the customer happy, they can escalate the issue to a supervisor or manager, once again shifting the decision-making responsibility to another person. These individuals are also working with technology such as computer hardware and software, Internet, Voice-over Internet Protocol (VoIP), and a host of telephone and cable issues. They are encouraged to think outside of the box, to be creative, inventive and intuitive in their problem-solving approaches. These circumstances provide plausible explanations for why there are more Problem Solvers than expected. The opposite analysis can explain why there are so few Navigators. Navigators like structure and order, they are objective, and they are perfectionist. These people like to follow a specific set of steps or procedures in order to resolve a problem and that is simply not the case in communication call centers. Call center positions within this type of organization require one to be quick and flexible and move in a multitude of directions all at the same time.

The financial industry was represented entirely by support staff associates working in the human resources department at American Fidelity-Group Assurance. Once again, these individuals are largely concerned with generating alternative solutions and presenting those solutions to either a Personnel Generalist, HR manager, or directly to another associate. These individuals do not have to make the final decision; that responsibility lies on someone else's shoulders. When a situation arises in which they

cannot find a solution, they escalate the issue to a supervisor or manager, once again shifting the decision-making responsibility to another person. These individuals excel at providing descriptive and detailed information and helping their customers or supervisors make the necessary connections between the problem and their proposed solutions.

The manufacturing industry was represented entirely by associates working in the finance department of Great Plains Coca-Cola Bottling Company. Given the type of work these associates perform, the finding of more Navigators than expected within this industry is logical. The work performed by these people requires them to be highly organized and structured, logical and systematic in their approaches, and to be objective and perfectionist. They are used to working within schedules and meeting deadlines. Their roles require them to seek logical connections, discover errors, and produce error-free reports.

Over-all the findings suggested that this study had more Engagers, fewer Navigators, and slightly more Problem Solvers than the ATLAS norms. However, by breaking down each industry and comparing the learning strategies to the industry, more specifically to the role of the participants within that industry, it can be concluded that the observed learning strategy patterns within each industry are logical given the nature of the participants' work.

In summary, there was a difference between the learning strategy distributions observed in this study and the ATLAS norms. However, by examining the nature of the participant's roles within each organization, it became clearer why each organization had more or less of the expected number of participants in each learning strategy. Thus, given their specific industry, the trainers at these three Oklahoma City businesses had logical

distributions with more or fewer Navigators or Problem Solvers than in the general population.

Preferred and Identified Work Roles (Conclusions #6, and #7)

Education and work roles. Part of the significant difference in the distribution of people in this study by preferred work roles among the education groups was that the Affective Leader group was primarily a group that had gotten some college training but had not earned a four-year degree. This implies that the group was made up of people who acquired some special technical training but did not need to have a four-year or advanced degree. This presumably technically-trained group had a conflicting DiSC behavior pattern related to preferred workplace roles, which appears to be related to their view of leadership. In the responses provided by the participants in this study the resulting DiSC Classical Profile Patterns indicated a preference for behavior/personality patterns that were high Dominance and Conscientiousness, these patterns are more indicative of individuals working from the Cognitive domain, not the Affective domain. They indicated a belief that leaders should Lead from the Heart. For this group of individuals, there is a dissonance between their preferred behavior/personality and their preferred view of leadership which will require further exploration in future studies to determine if this is an anomaly given the sample for this study.

The predominance of the Cognitive Leader group had a college degree. This college-educated group appears to believe that leaders should Lead from the Head, an approach based on using logic and on being less emotionally attached. Thus, more education may be associated with having more objective behavior in the work place.

The Team Member group had a disproportionably large number of members in the High School education category. Thus, the lowest educational level in the study was associated with being a team player as opposed to playing a leadership role.

In summary, the three groups identified by cluster analysis suggested a relationship between education level and preferred work role. The Affective Leader group had a special training emphasis that does not require a four-year degree while the Cognitive Leader group had an emphasis of people who did have the four-year degree or advanced degree, and those who preferred to be Team Members tended to have a High School diploma, its equivalency, or less.

Identified and preferred work roles. There was a dissonance between the study participants' identified work roles and their preferred work roles. Over 80% of the non-management participants indicated a preference for a leadership role, while 35.71% of the mid-level and 66.67% of the senior/executive managers indicated a preference for a team member role. These numbers raised some interesting questions. Why are people in the wrong positions? Is it because recruiters and hiring personnel did not assess the individual's skills and aptitude? Why are participants in positions for which they are over qualified? Did the state of the current economy force them to apply for and accept any paying position? Why did some people who do not want to be leaders end up in leadership positions? Did participants pad their resumes and interview beyond their skills and experience? Did they have a choice, or was their work role forced upon them? Did some managers accept positions just as a way to make more money without consideration to job demands and expectations? Are there individuals who may have a natural propensity to lead but have never been given the opportunity? One possible explanation

for the high percentage of High School educated participants who see themselves as leaders may come from the fact employers have never provided them an opportunity for leadership positions because of their level of education.

In summary, it is clear that the majority of non-managers in this study preferred or identified with work roles requiring leadership. However, based on the limited number of mid-level and senior/executive leaders in this study it is not so clear if the findings for these two groups are population indicators or merely sampling artifacts. There are many questions that need to be explored before definitive answers can be given to this topic and the only way to get these answers is to do more targeted research with mid-level to senior/executive leaders.

Recommendations

Numerous recommendations for further research and theoretical development derive from the findings and conclusions of this study.

1. Additional theories should be explored that address individual needs to refine, strengthen, and expand the theoretical/conceptual framework developed for this study. The emerging framework should inform a line of inquire focused on behavior/personality and learning in the workplace.
2. Additional research should be conducted to determine whether behavior/personality as assessed by DiSC and preferred learning strategy as measured by ATLAS are discrete constructs or are related. The first step should be re-analysis of this study's data with the assistance of a DiSC expert. Further research should then follow. The ultimate conclusions from this line of research should be used to refine the

theoretical/conceptual model for use and interpretation of DiSC and ATLAS as instrumented learning tools for workforce development

3. Further research should be conducted not only across all departments and roles within the three organizations in this study but also within all departments and roles of all ten industries identified by the United States Department of Labor and the United States Census Bureau. By expanding the line of inquiry across all industries the researcher will be able to identify whether specific patterns are typical of particular industries, department and job roles or if there are consistent patterns across all industries, departments and job roles.
4. Future research should use a stronger method of gathering participants. Future samples need to be larger and more diverse across all of the variables in this study.
5. The literature addressed the fact that Baby Boomers are currently leaving the workforce and that a large percentage of *migrating* workers are looking to change jobs within the next year. However, this study did not ask the participants if they were planning on leaving the workforce or changing jobs in the next one to three years. Questions addressing retirement and/or job change should be included in future research, as well as questions inquiring as to why workers are looking to retire or change jobs.
6. Future studies should include mixed method techniques to allow follow-up interviews to determine why certain DiSC profiles and ATLAS learning

strategies are prevalent in specific industries, educational levels, and age groups. Follow-up interviews could also help explain why samples do or do not conform to ATLAS norms.

7. The findings of this study indicated a large percentage of the participants in non-management roles preferred leadership roles and some of the managers in leadership roles preferred team member roles. Research should explore why people are in their current positions and how personal job role preference relate to job role realities.
8. Additional research should determine if the preferred work related roles model found in this study is supported or if it is changed by the inclusion of more participants.
9. Additional research should explore the possibility that other samples of personnel in the financial, information, and manufacturing industries prefer the DiSC profile patterns of Perfectionist, Creative, Results Oriented, and Inspirational or if behavior/personality patterning was an artifact of the limited sample used in this study.
10. Additional research should explore the possibility that other samples of Generation X and the Millennial generations prefer DiSC profile patterns with high Dominance and Conscientiousness scores or if this behavior/personality patterning was an artifact of the limited sample used in this study.
11. Additional research should explore the possibility that other samples of Generation X and Millennial generations prefer the Engager learning

strategy more then the Navigator learning strategy. This has implications for the ATLAS theory base, which has not yet been explored in relation to generations theory.

12. Additional research should explore why Baby Boomers and Millennials prefer leadership roles while Generation X does not, even though in this study they preferred DiSC profile patterns with high Dominance and Conscientiousness scores. This has implications for the DiSC theory bas and its relationships to both generations theory and leadership theory.
13. Additional research should explore the possibility that other Engagers prefer leadership roles vs. team member roles. The research also needs to explore why they prefer those roles.
14. Additional research should explore the possibility that other Navigators may prefer to lead from the affective domain. If that is the case, additional follow-up research needs to determine why they prefer to learn using the cognitive domain yet prefer to lead from the affective domain. This has implications for both the ATLAS theory base and for leadership theory.

Implications

This research adds a new perspective in understanding the internally-driven needs of behavior/personality and learning strategy in industrial workforce associates and how both are needed to increase over-all workforce effectiveness. Therefore, this study proved valuable to theory, research, and practice. First, the findings of this study point to the need of an expanded theory base for better understanding of industrial workforce associates. The findings of this study indicate that future studies utilizing DiSC and

industrial workforce associates should consider adding generations theory and leadership theory should be added if the researcher wants to explore any naturally occurring clusters in the data.

Second, the findings of this study add to the knowledge base of behavior/personality and learning strategy research regarding industrial workforce associates. Previous research using DiSC and ATLAS as single, stand alone assessments did not indicate any statistically significant relationships between the instruments and any demographic variables. However, this study, the first one to use the two instruments together, did indicate that further research using the combination of the DiSC and ATLAS instruments should include the demographic variables of age, education and industry as these variables revealed patterns that are different from what has been presented in previous research.

Third, this study provides significant implications for workforce hiring, training and management practice regarding the effectiveness of workforce associates. Recruiters, trainers, and managers should all realize that utilizing only one assessment for behavior/personality is not sufficient for training and leading associates; associates' learning strategies must also be taken into consideration, otherwise workforce effectiveness and turnover will continue to be negatively impacted. Recruiters, trainers, and managers should come to realize that by using two, or more, types of assessments will they begin to establish a more clear and concise profile of their associates, who they are, how they learn, and how they fit within the organization.

Final Thoughts

This research has the potential to benefit corporate recruiters, trainers, and managers by helping them understand how training and other communications need to be developed and delivered to ensure each individual learner is instructed in a way that maximizes knowledge, efficiency, and productivity.

Current literature (Carroll, 2003; Geier Learning International, 2003; Hogan et al., 2007; Keirsey, 2007) suggests that assessing an individual's behavior and personality profile is a necessary step for determining whether or not a candidate may be best suited for a particular job within an organization. This researcher suggests four main reasons why recruiters need to use some type behavior/personality assessment: (a) Talent searching, (b) Investment, (c) Mechanics, and (d) Environment.

Before recruiters actually begin the talent search they need to know what type of temperament fits the job in question. All of the major behavior/personality assessment companies for *Hogan Personality Assessments*, *Keirsey Temperament and Character Sorter*, *Myers-Briggs Type Indicator*, and *DiSC Personal Profile System 2800 Series* have established or identified behavior/personality profiles that are best suited for certain positions. Once the recruiters have identified the desired behavior/personality profiles, they can then administer a behavior/personality assessment to their candidates and correctly identify which individuals have the necessary temperament for the job. Second, turnover is a manageable cost in every organization, and in today's economic crises it is imperative that costs be reduced and managed very closely in order to avoid associate layoffs or businesses folding. If recruiters have done their job and hired the correct individual, this new associate should be a very profitable investment for the organization.

Likewise, if recruiters have not done their jobs properly and hired the wrong associate, then this could be a very costly investment.

Third, understanding an individual's behaviors/personality will also let recruiters know if the candidate can handle or perform the mechanics/responsibilities of the job. Hiring an individual with an accountant's personality would not be good idea if the position required the associate to constantly be in the public eye or a department manager. Last, behavior/personality assessments can assist the recruiter in determining if the candidate will fit into the work environment. Every organization and department has its own personality and energy. Recruiters not only have to hire individuals with the right skill sets, they have to hire associates who will fit into the organization and their new departments; in some cases this can be crucial to the success of the organization.

Once the recruiters have done their part, and the right individual has been hired, the associate becomes the responsibility of the trainers and department managers. All of the behavior/personality assessment information the recruiters have collected should be shared with these individuals so they have some baseline information about the new associate. In addition, trainers and managers need to understand how an individual prefers to learn new information if they want to ensure that the newly hired or promoted associates are in fact learning the necessary skills to perform on the job. This researcher suggests four main reasons why trainers and managers need to use a preferred learning strategy assessment in conjunction with a behavior/personality assessment: (a) Team instruction and building, (b) Individual instruction, (c) Motivation, and (d) Effective Coaching.

First, by understanding each individual's behavior/personality and preferred learning strategy, trainers and managers will have a better insight as to how to prepare for team instruction and team building. If a training class or department is made up primarily of associates with Dominance or Conscientiousness behavior/personality traits and a Navigator learning strategy, then the trainers or managers will want to structure the learning processes and activities in ways that these associates would prefer. If the class or department is equally represented by all four of the DiSC groups and all three of the ATLAS learning strategies groups, then the trainers or managers will want to make sure and construct learning processes and activities that are constantly changing or touching on each of the DiSC and ATLAS groups.

Second, by understanding each individual's behavior/personality and preferred learning strategy, trainers and managers will have a better insight as to how to provide each associate with individual instruction. There will be times in training environments and on the job that trainers/managers will need to work one-on-one with an associate because the individual is not making the necessary connections or progress. In these cases it is imperative for the trainers/managers to understand the associate's behavior/personality so they can communicate with the associate in a way that makes sense to the associate. Trainers/Managers also need to know which learning strategy to use with each learner. If the trainers/managers are trying to teach something to a Navigator but using Engager methods, the associate is going to become even more frustrated or lost. This lack of being able to communicate to an individual could be the reason why an associate chooses to terminate employment. In some cases, this lack of being able to relate to others with different behavior/personality traits and learning

strategies is what causes some trainers/managers to give up on an associate and possibly move to termination.

Third, by understanding each individual's behavior/personality and preferred learning strategy trainers and managers will have a better insight as to how to provide each associate with the proper type of motivation, incentive, or relevant support. Trainers/Managers need to know whether an associate is motivated by competition with peers, motivated by public or private recognition, motivated by watching or listening to situations where others have been motivated, incented by paid days off, incented by cash rewards, incented by corporate merchandise, incented by additional opportunities to learn, incented by opportunities to work on organization wide initiatives, incented by promotions, feel supported through one-on-one time with trainer/manager, or feel supported by constant "pats on the back" or hearing "good job." Just as there are many combinations of DiSC behavior/personality traits and different types of learning strategies, there are different ways to motivate each associate. Having an understanding of each associate's behavior/personality and preferred learning strategy can provide trainers and managers with insights as to what might motivate an associate to continue providing excellent productivity.

Last, by understanding each individual's behavior/personality and preferred learning strategy, trainers and managers will have a better insight as to how to provide each associate with the effective coaching. Whether a trainer is coaching for effectiveness by increasing knowledge and understanding or a manager is coaching for effectiveness by increasing productivity or eliminating undesired practices, it will be better understood and appreciated if it is presented in a way that is aligned with the associate's

behavior/personality and preferred learning strategy. Imagine a trainer who has an Inspirational (high Influence) DiSC Classical Profile Pattern and who is an Engager according to ATLAS trying to coach an associate with a Results-Oriented (high Dominance) DiSC Classical Profile Patten and who is a Navigator according to ATLAS. How successful is the coaching session going to be if the trainer does not understand the associate's behavior/personality and learning style and does not communicate with the associate as a Results-Oriented Navigator? Not very successful. Trainers/Managers must know who they are and they must possess knowledge of all the personalities and learning strategies so they may be able to continually change their method of communication to ensure that all associates are hearing and understanding the message the trainers/managers are communicating.

While no assessment of behavior/personality or learning strategy is perfect, this researcher created the T.I.M.E. and I.M.P.R.O.V.E. constructs and proposes that the combination of two specific instrumented learning assessments – one that assesses behavior/personality (DiSC), and one that assesses learning strategies (ATLAS) – could very well provide a powerful compilation of data that could be used to ensure recruiters, trainers, and managers each use their T.I.M.E. (see Table 32) with each candidate/associate to its fullest potential. The combination of these two specific instrumented learning assessments could also provide a powerful compilation of data that

Table 32. Benefits to Recruiters, Trainers and Managers of using both a behavior/ personality assessment and a learning strategy assessment

	Recruiters	Trainers	Managers
T	Talent Searching	Team Instruction/Building	Team Instruction/Building
I	Investment	Individual Instruction	Individual Instruction
M	Mechanics	Motivation	Motivation
E	Environment	Effective Coaching	Effective Coaching

could be used to ensure that the needs of each learner are met and I.M.P.R.O.V.E. workforce effectiveness by improving:

Image, both individual and organization
Moral
Productivity
Rewards for performance
Opportunities for advancement
Value for shareholders
Employee tenure

Whether one's role is that of a recruiter, trainer, manager, or associate, it is the opinion of this researcher that there is much to gain in the way of increased workforce effectiveness by implementing the use of a learning strategy assessment like ATLAS in conjunction to any current behavior/personality assessment like *Hogan Personality Assessments*, *Keirsey Temperament and Character Sorter*, *Myers-Briggs Type Indicator*, or *DiSC Personal Profile System 2800 Series*. It is further proposed that if further research can locate and identify reliable relationships between preferred learning strategies and behavior/personality variables or patterns, then these relationships could become extremely useful predictors of needs-based patterns in employees. Such knowledge would offer a powerful tool for trainers, and managers in developing communications, working environments, and learning opportunities to maximize the growth and contributions of each member of their workforce.

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APPENDICES

APPENDIX A

DiSC CLASSICAL PROFILE PATTERNS

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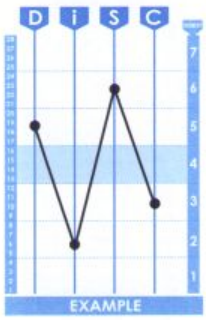
Classical Profile Patterns

DiSC® Classic

Achiever Pattern



Emotions: is industrious and diligent; displays frustration

Goal: personal accomplishments, sometimes at the expense of the group's goal

Judges others by: ability to achieve concrete results

Influences others by: accountability for own work

Value to the organization: sets and completes key result areas for self

Overuses: self-reliance; absorption in the task

Under pressure: becomes frustrated and impatient; becomes more of a "do-er" and less of a "delegator"

Fears: others with competing or inferior work standards affecting results

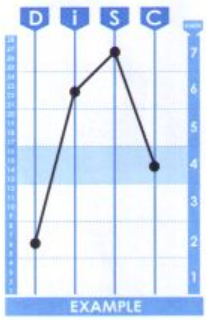
Would increase effectiveness through: less "either-or" thinking; clearer task priorities; consideration of optional approaches; willingness to compromise short-term for long-range benefits

The motivation of Achievers is largely internal and flows from deeply felt personal goals. Their commitment to their own goals prevents them from automatically accepting the group's goals. Achievers need to see how they can blend their personal goals with the organization's goals. By retaining control over the direction of their lives, Achievers develop a strong sense of accountability.

Achievers demonstrate a keen interest in their work and an intense, continual pursuit of accomplishment. They have a high opinion of their work and may hesitate to delegate tasks when under pressure. Instead, they take on the work themselves to ensure that things are done right. When they delegate, they have a tendency to take back the task if it does not go according to their expectations. Their guiding premise is, "If I succeed, I want the credit; if I fail, I will take the blame."

An Achiever should communicate more with others to expand their thinking beyond either "I have to do it myself" or "I want all the credit." They may need help in finding new approaches for achieving their desired results. Achievers function at peak efficiency, and they expect recognition equal to their contribution — high wages in for-profit organizations and leadership positions in other groups.

Agent Pattern



Emotions: accepts affection; rejects aggression

Goal: group acceptance

Judges others by: commitment to tolerate and include everyone

Influences others by: empathy; friendship

Value to the organization: supports, harmonizes, empathizes; focuses on service

Overuses: kindness

Under pressure: becomes persuasive, using information or key friendships if necessary

Fears: dissent; conflict

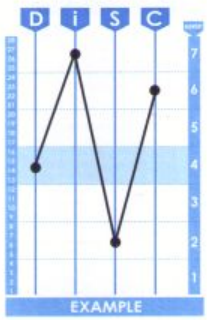
Would increase effectiveness through: strength in the realization of who they are and what they can do; firmness and self-assertion; ability to say "no" when appropriate

Agents are attentive to both the human relations and task aspects of their work situation. Empathetic and supportive, they are good listeners and known for their willing ear. Agents make people feel wanted and needed. Because Agents respond to others' needs, people do not fear being rejected by Agents. Agents offer friendship and are willing to perform services for others.

Agents have excellent potential for organizing and completing tasks effectively. Agents naturally promote harmony and teamwork and are particularly good at doing for others what they find difficult to do for themselves.

Agents fear conflict and dissent. Their supportive approach may enable others to tolerate a situation rather than encouraging them to engage in active problem-solving. In addition, the Agent's tendency to adopt a "low profile" — instead of having open confrontations with aggressive individuals — may be perceived as a lack of "toughness." Although they are concerned with fitting into the group, Agents have a fair degree of independence.

Appraiser Pattern



Emotions: is driven to look good

Goal: "victory" with flair

Judges others by: ability to initiate activities

Influences others by: competitive recognition

Value to the organization: accomplishes goals with the team

Overuses: authority; ingenuity

Under pressure: becomes restless, critical, impatient

Fears: "loss" or "failure"; others' disapproval

Would increase effectiveness through: individual follow-through; empathy when showing disapproval; steadier pace

Appraisers make creative ideas serve practical purposes. They use direct methods to accomplish results. Appraisers are competitive, but other people tend to view them as assertive rather than aggressive because Appraisers are considerate of others. Instead of giving orders or commands, Appraisers involve people in the task through persuasion. They elicit the cooperation of those around them by explaining the rationale for the proposed activities.

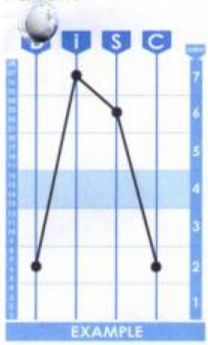
Appraisers help others to visualize the steps needed in order to accomplish results. Appraisers usually speak from a detailed plan of action that they have developed in order to ensure an orderly progression toward results. In their eagerness to win, Appraisers can become impatient when their standards are not maintained or when extensive follow-through is required.

Appraisers are good critical thinkers. They are verbal in their criticisms and their words occasionally may be caustic. Appraisers have a better control of the situation if they relax and pace themselves. A helpful axiom to achieve this is, "You win some, you lose some."

Classical Profile Patterns

DiSC® Classic

Counselor Pattern



Emotions: is approachable; shows affection and understanding

Goal: friendship; happiness

Judges others by: positive acceptance of others; ability to look for the good in people

Influences others by: personal relationships; "open door" policy

Value to the organization: remains stable and predictable; develops a wide range of friendships; listens to others' feelings

Overuses: indirect approach; tolerance

Under pressure: becomes overly flexible and intimate; is too trusting without differentiating among people

Fears: pressuring people; being accused of causing harm

Would increase effectiveness through: attention to realistic deadlines; initiative to complete the task

Counselors are particularly effective at solving people's problems. They impress others with their warmth, empathy, and understanding. Their optimism makes it easy to look for the good in others. Counselors prefer to deal with others by building long-standing relationships. As a good listener with a willing ear for problems, a Counselor offers suggestions gently and refrains from imposing his or her ideas on others.

Counselors tend to be overly tolerant and patient with non-producers. Under pressure, they may have difficulty confronting performance problems. Counselors may be indirect when issuing orders, making demands, or disciplining others. By adopting the attitude that "people are important," Counselors may place less emphasis on task accomplishment. They sometimes require help in setting and meeting realistic deadlines.

Counselors often take criticism as a personal affront, but they respond well to attention and compliments for well-done assignments. When in a position of responsibility, Counselors tend to be attentive to the quality of working conditions and provide adequate recognition for members of their group.

Creative Pattern

Emotions: accepts aggression; restrains expression

Goal: dominance; unique accomplishments

Judges others by: personal standards; progressive ideas for accomplishing tasks

Influences others by: ability to pace development of systems and innovative approaches

Value to the organization: initiates or designs changes

Overuses: bluntness; critical or condescending attitude

Under pressure: becomes bored with routine work; sulks when restrained; acts independently

Fears: lack of influence; failure to achieve their standards

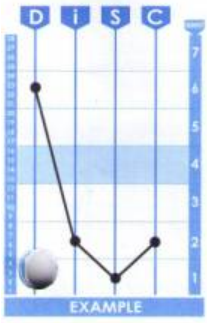
Would increase effectiveness through: warmth; tactful communication; effective team cooperation; recognition of existing sanctions

Persons with a Creative Pattern display opposing forces in their behavior. Their desire for tangible results is counterbalanced by an equally strong drive for perfection, and their aggressiveness is tempered by sensitivity. Although they think and react quickly, they are restrained by the wish to explore all possible solutions before making a decision.

Creative persons exhibit foresight when focusing on projects, and they bring about change. Since individuals with a Creative Pattern have a drive for perfection and demonstrate considerable planning ability, the changes they make are likely to be sound, but the method they choose may lack attention to interpersonal relationships.

Creative persons want freedom to explore, and they want the authority to examine and retest findings. They can make daily decisions quickly but may be extremely cautious when making bigger decisions: "Should I accept that promotion?" "Should I move to another location?" In their drive for results and perfection, Creative persons may not be concerned about social poise. As a result, they may be cool, aloof, or blunt.

Developer Pattern



Emotions: is concerned with meeting personal needs

Goal: new opportunities

Judges others by: ability to meet the Developer's standards

Influences others by: finding solutions to problems; projecting a personal sense of power

Value to the organization: avoids "passing the buck"; seeks new or innovative problem-solving methods

Overuses: control over people and situations to accomplish his or her own results

Under pressure: works alone to complete tasks; is belligerent if individualism is threatened or challenging opportunities disappear

Fears: boredom; loss of control

Would increase effectiveness through: patience, empathy; participation and collaboration with others; follow-through and attention to quality control

Developers tend to be strong-willed individualists, continually seeking new horizons. As self-reliant, independent thinkers, they prefer to find their own solutions. Relatively free of the constraining influence of the group, Developers are able to bypass convention and often create innovative solutions.

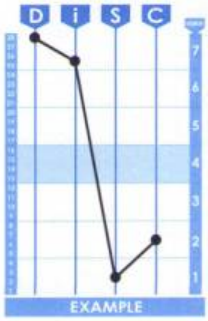
Although they most often use direct, forceful behavior, Developers can also shrewdly manipulate people and situations. When required to participate with others in situations that limit their individualism, Developers tend to become belligerent. They are persistent when pursuing the results they desire and will do whatever is necessary to overcome obstacles to success. In addition, they have high expectations of others and can be critical when their standards are not met.

Developers are most interested in achieving their own goals. Opportunities for advancement and challenge are important to them. By focusing on results, they may lack empathy or seem uncaring by dismissing others' concerns.

Classical Profile Patterns

DiSC® Classic

Inspirational Pattern



Emotions: accepts aggression; downplays need for affection

Goal: control of their environment or audience

Judges others by: projection of personal strength, character, and social power

Influences others by: charm, direction, intimidation; use of rewards

Value to the organization: acts as a "people mover"; initiates, demands, compliments, disciplines

Overuses: attitude that "the ends justify the means"

Under pressure: becomes manipulative, quarrelsome or belligerent

Fears: weak behavior; loss of social status

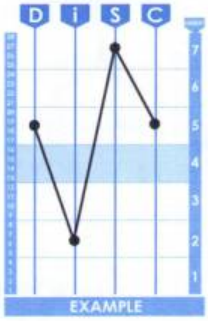
Would increase effectiveness through: genuine sensitivity; willingness to help others to succeed in their own personal development

Persons with the Inspirational Pattern consciously attempt to modify the thoughts and actions of others. They want to control their environment. They are astute at identifying and manipulating an individual's existing motives in order to direct that person's behavior toward a predetermined end.

Inspirational persons are clear about the results they want, but they do not always immediately verbalize them. They state the results they want only after they have primed the other person, offering friendship to those who desire acceptance, authority to those who seek power, and security to those who want a predictable environment.

Inspirational persons can be charming in their interactions. They are persuasive when they want help in repetitive and time-consuming details. People often experience a conflicting sensation by feeling drawn to Inspirational people and yet being curiously distanced. Others may feel "used" by Inspirational persons' powers of manipulation. Although they sometimes inspire fear in others and override their decisions, Inspirational persons are generally well liked by co-workers because they use their considerable verbal skills to persuade others whenever possible. Inspirational persons clearly prefer to accomplish goals through cooperation and persuasion instead of domination.

Investigator Pattern



Emotions: is dispassionate; demonstrates self-discipline

Goal: power through formal roles and positions of authority

Judges others by: use of factual information

Influences others by: determination, tenacity

Value to the organization: offers comprehensive follow-through; works determinedly on tasks individually or in a small group

Overuses: bluntness; suspicion of others

Under pressure: tends to internalize conflict; holds on to grudges

Fears: involvement with the masses; responsibility to sell abstract ideas

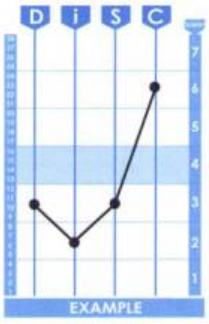
Would increase effectiveness through: flexibility; acceptance of others; personal involvement with others

Objective and analytical, Investigators are dispassionate "anchors of reality." Generally undemonstrative, they calmly and steadily pursue an independent path toward a fixed goal. Investigators are successful at many things, not because of versatility but due to their dogged determination to follow through. They seek a clear purpose or goal from which they can develop an orderly plan and organize their actions. Once a project has begun, Investigators fight tenaciously to achieve their objectives. Intervention is sometimes needed to change their direction. As a result, they can be perceived as stubborn and opinionated.

Investigators do well with challenging technical assignments in which they can use actual data to interpret the information and draw conclusions. They respond to logic rather than emotion. When selling or marketing an idea, they are most successful with a concrete product.

Investigators are not especially interested in pleasing people, and they prefer to work alone. They can be perceived as cold, blunt, and tactless. Because they value their own thinking ability, Investigators evaluate others by how they use facts and logic. To increase their effectiveness in personal interactions, Investigators need to develop a greater understanding of other people, especially others' emotions.

Objective Thinker Pattern



Emotions: rejects interpersonal aggression

Goal: correctness

Judges others by: ability to think logically

Influences others by: use of facts, data, and logical arguments

Value to the organization: defines and clarifies; obtains, evaluates, and tests information

Overuses: analysis

Under pressure: becomes worrisome

Fears: irrational acts; ridicule

Would increase effectiveness through: self-disclosure; public discussion of their insights and opinions

Objective Thinkers tend to have highly developed critical thinking abilities. They emphasize the importance of facts when drawing conclusions and planning actions, and they seek correctness and accuracy in everything they do. To manage their work activities effectively, Objective Thinkers often combine intuitive information with the facts they have gathered. When in doubt about a course of action, they avoid public failure by preparing meticulously. For example, Objective Thinkers will master a new skill privately before they use it in a group activity.

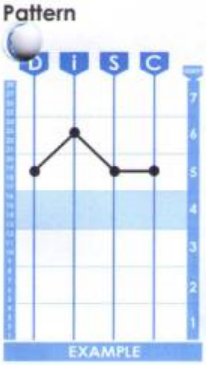
Objective Thinkers prefer to work with people who, like themselves, are interested in maintaining a peaceful work environment. Considered shy by some, they may be reticent in expressing their feelings. They are particularly uncomfortable with aggressive people. Despite being mild-mannered, Objective Thinkers have a strong need to control their environment. They tend to exert this control indirectly by requiring others to adhere to rules and standards.

Objective Thinkers are concerned with the "right" answer and may have trouble making decisions in ambiguous situations. With their tendency to worry, they may get bogged down in "analysis paralysis." When they make a mistake, Objective Thinkers often hesitate to acknowledge it. Instead, they immerse themselves in a search for information that supports their position.

Classical Profile Patterns

DiSC® Classic

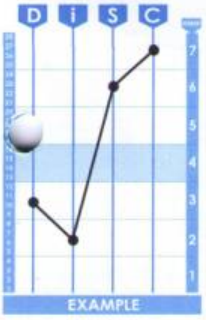
Overshift Pattern



Before you go further, review your profile graph scores for the possibility of errors made when computing your responses or plotting your scores. An Overshift Pattern occurs when all four plotting points are positioned in the upper portion of the graph. This indicates that the person considers all four behavioral styles to be of equally high importance. As a result, the **shape** of the profile does not match any of the commonly occurring Classical Profile Patterns.

Classical Patterns represent combinations of high and low plotting points, whereas the Overshift Pattern has only high plotting points. When an Overshift Pattern appears in Graph III, it is recommended that one of the other two graphs be used for interpretation, but remember that Graph I or Graph II represents only half of the responses. It may be helpful to retake the profile with a clearer focus.

Perfectionist Pattern



Emotions: displays competence; is restrained and cautious

Goal: stability; predictable accomplishments

Judges others by: precise standards

Influences others by: attention to detail; accuracy

Value to the organization: is conscientious; maintains standards; controls quality

Overuses: procedures and "fail-safe" controls; overdependence on people, products, and processes that have worked in past

Under pressure: becomes tactful and diplomatic

Fears: antagonism

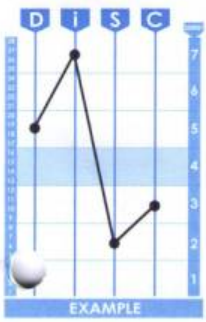
Would increase effectiveness through: role flexibility; independence and interdependence; belief in self-worth

Perfectionists are systematic, precise thinkers and workers who follow procedure in both their personal and work lives. Extremely conscientious, they are diligent in work that requires attention to detail and accuracy. Because they desire stable conditions and predictable activities, Perfectionists are most comfortable in a clearly defined work environment. They want specifics on work expectations, time requirements, and evaluation procedures.

Perfectionists may become bogged down in the details of the decision-making process. They can make major decisions but may be criticized for the amount of time they take to gather and analyze information. Although they like to hear the opinions of their managers, Perfectionists take risks when they have facts that they can interpret and use to draw conclusions.

Perfectionists evaluate themselves and others by precise standards for achieving concrete results while adhering to standard operating procedures. This conscientious attention to standards and quality is valuable to the organization. Perfectionists may define their worth too much by what they do and not by who they are as people. As a result, they tend to react to personal compliments by thinking, "What does this person want?" By accepting sincere compliments, Perfectionists can increase their self-confidence.

Persuader Pattern



Emotions: trusts others; is enthusiastic

Goal: authority and prestige; status symbols

Judges others by: ability to express themselves; flexibility

Influences others by: friendly, open manner; verbal skills

Value to the organization: sells and closes; delegates responsibility; is poised and confident

Overuses: enthusiasm; selling ability; optimism

Under pressure: becomes indecisive and is easily persuaded; becomes organized in order to look good

Fears: fixed environment; complex relationships

Would increase effectiveness through: challenging assignments; attention to task-oriented service and key details; objective data analysis

Persuaders work with people, striving to be friendly while pushing forward their own objectives. Outgoing and interested in people, Persuaders have the ability to gain the respect and confidence of various types of people. Persuaders can impress their thoughts on others, drawing people to them and retaining them as clients or friends. This ability is particularly helpful when Persuaders sell themselves or their ideas to win positions of authority.

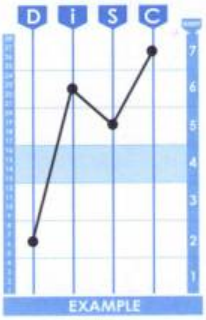
The most favorable environment for Persuaders includes working with people, receiving challenging assignments, and experiencing a variety of work activities that require mobility. They seek work assignments that will give them the opportunity to look good. As a result of their naturally positive outlook, Persuaders may be too optimistic about a project's results and others' potential. Persuaders also tend to overestimate their ability to change the behavior of others.

Although Persuaders desire freedom from routine and regimentation, they need to receive analytical data on a systematic basis. Once alerted to the importance of the "little things," Persuaders can use the information to balance their enthusiasm with a realistic assessment of the situation.

Classical Profile Patterns

DiSC® Classic

Practitioner Pattern



Emotions: wants to keep up with others in effort and technical performance

Goal: personal growth

Judges others by: self-discipline; position and promotions

Influences others by: confidence in their ability to master new skills; development of "proper" procedures and actions

Value to the organization: is skilled in technical and people problem-solving; displays proficiency and specialization

Overuses: overattention to personal objectives; unrealistic expectations of others

Under pressure: becomes restrained; is sensitive to criticism

Fears: being too predictable; no recognition as an "expert"

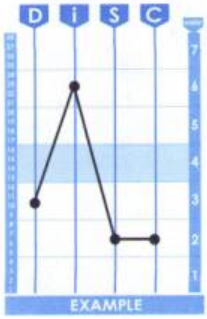
Would increase effectiveness through: genuine collaboration for common benefit; delegation of key tasks to appropriate individuals

Practitioners value proficiency in specialized areas. Spurred on by a desire to be "good at something," they carefully monitor their own work performance. Although their aim is to be "the" expert in an area, Practitioners frequently give the impression that they know something about everything. This image is particularly strong when they express their knowledge on a variety of subjects.

As Practitioners interact with others, they project a relaxed, diplomatic, and easygoing style. This congenial attitude may change quickly in their own work area when they become intensely focused in order to meet high standards for performance. Practitioners evaluate others on the basis of their self-discipline as measured by their daily performance. They have high expectations for themselves and others, and they tend to express their disappointment.

Although they naturally concentrate on developing an organized approach to work and increasing their own skills, Practitioners also need to help others to build skills. In addition, they need to increase their appreciation of those who contribute to the work effort even though they may not use the Practitioner's preferred methods.

Promoter Pattern



Emotions: is willing to accept others

Goal: approval, popularity

Judges others by: verbal skills

Influences others by: praise, opportunities, favors

Value to the organization: relieves tension; promotes projects and people, including him or herself

Overuses: praise, optimism

Under pressure: becomes careless and sentimental; is disorganized

Fears: loss of social acceptance and self-worth

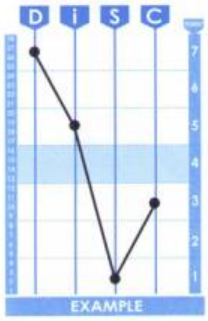
Would increase effectiveness through: control of time; objectivity; sense of urgency; emotional control; follow-through on promises and tasks

Promoters have an extensive network of contacts. They are usually gregarious and socially adept, and they develop friendships easily. They rarely antagonize others intentionally. Promoters seek favorable social environments where they can develop and maintain their contacts. Verbally skilled, they promote their own ideas and create enthusiasm for others' projects. With their wide range of contacts, Promoters have access to the people who can help them.

Since Promoters prefer to participate and interact with others in activities, they may be less interested in task accomplishment. They may continue to seek out any situation that involves meeting people and socializing even though their job requires attention to more solitary activities. They thrive on meetings, committees, and conferences.

Usually optimistic, Promoters tend to overestimate the ability of others. They often leap to favorable conclusions without considering all the facts. Promoters will learn to be objective and emphasize results with coaching and direction. Time management may present challenges for Promoters. By setting a time limit on conversation and discussion, they can remind themselves of the urgency of "closing" and accomplishing the task.

Result-Oriented Pattern



Emotions: verbalizes ego strength; displays rugged individualism

Goal: dominance and independence

Judges others by: ability to accomplish tasks quickly

Influences others by: force of character; diligence

Value to the organization: persistence; doggedness

Overuses: impatience; "win-lose" competition

Under pressure: becomes critical and fault-finding; resists participating with a team; may overstep boundaries

Fears: others will take advantage of them; slowness, especially in task activities; being a pushover

Would increase effectiveness through: explanation of their reasoning and consideration of other views and ideas about goals and solutions to problems; genuine concern for others; patience and humility

Result-Oriented people display self-confidence, which some may interpret as arrogance. They actively seek opportunities that test and develop their abilities to accomplish results. Result-Oriented persons like difficult tasks, competitive situations, unique assignments, and "important" positions. They undertake responsibilities with an air of self-importance and display self-satisfaction once they have finished.

Result-Oriented people tend to avoid constraining factors, such as direct controls, time-consuming details, and routine work. Because they are forceful and direct, they may have difficulties with others. Result-Oriented people prize their independence and may become restless when involved with group activities or committee work. Although Result-Oriented people generally prefer to work alone, they may persuade others to support their efforts, especially when completing routine activities.

Result-Oriented people are quick thinkers, and they are impatient and critical toward those who are not. They evaluate others on their ability to get results. Result-Oriented people are determined and persistent even in the face of antagonism. They take command of the situation when necessary, whether or not they are in charge. In their uncompromising drive for results, they may appear blunt and uncaring.

Classical Profile Patterns

DiSC® Classic

Specialist Pattern

Emotions: is calculatingly moderate; accommodates others

Goal: maintenance of the status quo; controlled environment

Judges others by: friendship standards; competence

Influences others by: consistent performance; accommodating others

Value to the organization: plans short term; is predictable, consistent; maintains steady pace

Overuses: modesty; low risk-taking; passive resistance to innovation

Under pressure: becomes adaptable to those in authority and thinks with the group

Fears: change, disorganization

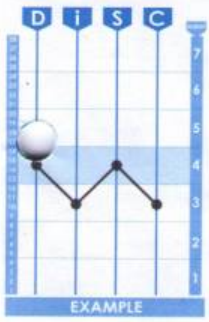
Would increase effectiveness through: public discussion of their ideas; self-confidence based on feedback; shortcut methods

Specialists "wear well" with others. With their controlled stance and modest manner, they are able to work well with a number of behavioral styles. Specialists are considerate, patient, and always willing to help those they consider friends. They build close relationships with a relatively small group of associates in the work environment.

Their efforts are directed toward retaining familiar and predictable patterns. Most effective in specialized areas, Specialists plan their work along directed channels and achieve a remarkably consistent performance. Appreciation from others helps to maintain that level of consistency.

Specialists are slow to adapt to change. Prior conditioning gives them time to change their procedures while maintaining a consistent level of performance. Specialists may need help to start new projects or develop shortcut methods to meet deadlines. Finished projects are often put aside for further revisions. Specialists should consider throwing away old files that have outlived their usefulness.

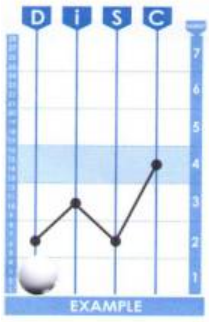
Tight Pattern



Before you go further, review your profile graph scores for the possibility of errors made when computing your responses or plotting your scores. A Tight Pattern occurs when all four plotting points are positioned in the middle area of the graph with only one segment difference between the four points. This indicates that the person considers all four behavioral styles to be of equal importance. As a result, the **shape** of the profile does not match any of the commonly occurring patterns.

Classical Profile Patterns represent combinations of high and low plotting points, whereas the Tight Pattern has plotting points only in the middle area. When a Tight Pattern appears in Graph III, it is recommended that one of the other two graphs be used for interpretation, but remember that Graph I or Graph II represents only half of the responses. It may be helpful to retake the profile with a clearer focus.

Undershift Pattern



Before you go further, review your profile graph scores for the possibility of errors made when computing your responses or plotting your scores. An Undershift Pattern occurs when all four plotting points are positioned in the lower portion of the graph. This indicates that the person considers all four behavioral styles to be of equally low importance. As a result, the **shape** of the profile does not match any of the commonly occurring patterns.

Classical Patterns represent combinations of high and low plotting points, whereas the Undershift Pattern has only low plotting points. When an Undershift Pattern appears in Graph III, it is recommended that one of the other two graphs be used for interpretation, but remember that Graph I or Graph II represents only half of the responses. It may be helpful to retake the profile with a clearer focus.

APPENDIX B

RESEARCH QUESTIONNAIRE

Response Page (Choose <u>one</u> MOST and <u>one</u> LEAST in each of the 28 groups of words)

		Most	Least
1	Enthusiastic		
	Daring		
	Diplomatic		
	Satisfied		
2	Cautious		
	Determined		
	Convincing		
	Good-natured		
3	Friendly		
	Accurate		
	Outspoken		
	Calm		
4	Talkative		
	Controlled		
	Conventional		
	Decisive		
5	Adventurous		
	Insightful		
	Outgoing		
	Moderate		
6	Gentle		
	Persuasive		
	Humble		
	Original		
7	Expressive		
	Conscientious		
	Dominant		
	Responsive		
8	Poised		
	Observant		
	Modest		
	Impatient		
9	Tactful		
	Agreeable		
	Magnetic		
	Insistent		

		Most	Least
10	Brave		
	Inspiring		
	Submissive		
	Timid		
11	Reserved		
	Obliging		
	Strong-willed		
	Cheerful		
12	Stimulating		
	Kind		
	Perceptive		
	Independent		
13	Competitive		
	Considerate		
	Joyful		
	Private		
14	Fussy		
	Obedient		
	Firm		
	Playful		
15	Attractive		
	Introspective		
	Stubborn		
	Predictable		
16	Logical		
	Bold		
	Loyal		
	Charming		
17	Sociable		
	Patient		
	Self-reliant		
	Soft-spoken		
18	Willing		
	Eager		
	Thorough		
	High-spirited		

		Most	Least
19	Aggressive		
	Extroverted		
	Amiable		
	Fearful		
20	Confident		
	Sympathetic		
	Impartial		
	Assertive		
21	Impulsive		
	Introverted		
	Forceful		
	Easygoing		
22	Well-disciplined		
	Generous		
	Animated		
	Persistent		
23	Good mixer		
	Refined		
	Vigorous		
	Lenient		
24	Captivating		
	Contented		
	Demanding		
	Compliant		
25	Argumentative		
	Systematic		
	Cooperative		
	Light-hearted		
26	Jovial		
	Precise		
	Direct		
	Even-tempered		
27	Restless		
	Neighborly		
	Appealing		
	Careful		
28	Respectful		
	Pioneering		
	Optimistic		
	Helpful		

OVER 

Directions: The following statements relate to learning in real-life situations in which you control the learning situation. These are situations that are not in a formal school. Instead, these are situations like learning things related to learning to operate a new computer program or learning for your professional development. For each statement, select the one answer that best fits you. Some of the items may look similar to you, so it is important that <u>once you respond to an item, do not go back and change any items</u>.

29 When considering a new learning activity such as learning a new craft, hobby or skill for use in my personal life:

- ☐ A) I like to identify the best possible resources such as manuals, books, modern information sources, or experts for the learning project
- ☐ B) I usually will not begin the learning activity until I am convinced that I will enjoy it enough to successfully finish it

---

30 It is important for me to:

- ☐ A) Focus on the end result and then set up a plan with such things as schedules and deadlines for learning it
- ☐ b) Think of a variety of ways of learning the material

---

31 I like to:

- ☐ A) Involve other people who know about the topic in my learning activity
- ☐ B) Structure the information to be learned to help remind me that I can successfully complete the learning activity

---

32 I like to:

- ☐ A) Set up a plan for the best way to proceed with a specific learning task
- ☐ B) Check out the resources that I am going to use to make sure that they are the best ones for the learning task

---

33 I like to:

- ☐ A) Involve other people who know about the topic in my learning activity
- ☐ B) Determine the best way to proceed with a learning task by evaluating the results that I have already obtained during the learning task

---

Please provide the one response from each of the six topics that <u>MOST</u> accurately reflects you.

34 Age - year you were born

19_____

35 Gender

- ☐ Female
- ☐ Male

36 Management Level

- ☐ Non-management
- ☐ Supervisor/Front-line manager
- ☐ Mid-level manager
- ☐ Senior/Executive manager

37 Ethnicity

- ☐ African-American
- ☐ Asian
- ☐ Caucasian
- ☐ Hispanic/Latino
- ☐ Indonesian
- ☐ Island Pacific
- ☐ Multi-Racial
- ☐ Native American
- ☐ Other:_____

38 Highest level of education

- ☐ Less than High School
- ☐ General Education Diploma
- ☐ High School Diploma
- ☐ Vocational Education Certificate
- ☐ Some College
- ☐ Associates Degree
- ☐ Bachelors Degree
- ☐ Masters Degree
- ☐ Doctorate/Professional Degree

39 Industry

- ☐ Communication
- ☐ Financial
- ☐ Beverage

APPENDIX C

IRB APPROVAL FORM

Oklahoma State University Institutional Review Board

Date:	Monday, April 07, 2008
IRB Application No	ED0863
Proposal Title:	Relationships Among Behavior-Personality Variables, Preferred Learning Strategies, and Learner Characteristics in the Workplace
Reviewed and Processed as:	Exempt

Status Recommended by Reviewer(s): Approved Protocol Expires: 4/6/2009

Principal Investigator(s):

Jeffery W. Cooper
2309 NW 49th St.
Okla. City, OK 73112

Lynna Ausburn
257 Willard
Stillwater, OK 74078

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

☒ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Beth McTernan in 219 Cordell North (phone: 405-744-5700, beth.mcternan@okstate.edu).

Sincerely,

Shelia Kennison, Chair
Institutional Review Board

APPENDIX D

INFORMED CONSENT FORM

Research Consent Information Sheet

Relationships Among Behavior-Personality Variables, Preferred Learning Strategies, and Learner Characteristics in the Workplace

This research project is being conducted by Jeffery W. Cooper, a PhD Candidate at Oklahoma State University, to study possible relationships between people's behavior/personality, preferred learning strategies, and personal characteristics.

Specifically, this research will be collecting data using two different instruments: DiSC Personal Profile assessment and ATLAS (Assessing The Learning Strategies of Adults) to see how individual behavior/personality and preferred strategies for learning may be related. By agreeing to participate in this research, you agree that you understand the following information about your participation:

- You understand that your participation in this research is completely **voluntary**. There are no special incentives for your participation and there are no negative consequences for declining participation.
- You understand the purpose of the research is to help the researcher understand more about how behavior/personality, learning preferences, and personal characteristics may be related.
- You understand that you are free to withdraw your consent for participation at any time. During the research collection process, you can withdraw by telling the researcher that you do not wish to continue and wish to withdraw. After you have left the research session, you can withdraw by contacting the principal investigator (listed at the end of this document) and providing the personal number you were assigned at the research session.
- You understand that your participation will take approximately 30 minutes of your time.
- You understand you will answer 28 questions describing yourself and your behavior.
- You understand you will answer 5 questions describing how you like to learn.
- You understand you will answer 6 questions about your background and personal characteristics.

You understand and agree to the following conditions regarding the safeguarding of your privacy and identify as a participant in this research:

- Information you provide will be anonymous and treated with complete confidentiality.
- Information you provide will be secured at all times by the Principal Investigator, who is a student at Oklahoma State University. All documents will be secured in a locked cabinet until they have been entered into a statistical database and then will be shredded. Only the computer database information will be retained for a period of three years by the Principal Investigator. After this time the database records, will also be destroyed.
- The data from this research will be used solely for research reporting and improved understanding of learning needs and training delivery. This research has the potential to benefit corporate hiring professionals, training professionals, managers, and individual associates on how training and other communications need to be developed and delivered to ensure each individual learner is instructed in a way that maximizes knowledge, efficiency, and productivity.

- Any data from this research used in presentation and publication of professional literature and reports will be anonymous and reported only in aggregated and/or in codes. No reference to your name or personal identity will be made at any time.
- All records of this research will be kept solely by the Principal Investigator and will be maintained under locked security and destroyed as detailed above.
- There are no known risks associated with participating with this research beyond those encountered in daily life.

If you have questions or concerns, you may contact the Principal Investigator, Jeffery Cooper, by phone at (405) 706-4966 or by email at jeffery.cooper@okstate.edu or his academic advisor, Dr. Lynna Ausburn, by phone at Oklahoma State University at (405) 744-8322 or by email at lynna.ausburn@okstate.edu

If you have questions about your rights as a research volunteer, you may contact Dr. Shelia Kennison, IRB Chair, 219 Cordell North, Stillwater, OK 74078, 405-744-1676 or irb@okstate.edu

To give your consent to participate in this research and submit your data to the researcher for inclusion in analysis and use in professional education literature, please remove this Consent Information Sheet and proceed with the research procedures. Please keep this document for your records and personal use.

VITA

Jeffery Wayne Cooper

Candidate for the Degree of

Doctor of Philosophy

Dissertation: RELATIONSHIPS AMONG BEHAVIOR-PERSONALITY VARIABLES, PREFERRED LEARNING STRATEGIES, AND LEARNER CHARACTERISTICS IN THE WORKPLACE

Major Field: Occupational Education Studies

Biographical:

Personal Data: Born February 14, Blytheville, Arkansas

Education: Bachelor of Science, University of Central Oklahoma, Edmond, Oklahoma in May 1992; Graduated with honors, Master of Education, University of Central Oklahoma, Edmond, Oklahoma in December, 2004; Completed the requirements for the Doctor of Philosophy in your Occupational Education Studies at Oklahoma State University, Stillwater, Oklahoma in December, 2008.

Experience: Graduate, Research, and Teaching Assistant at Oklahoma State University. Director of Training & Development and Recruiting at Cox Communications Incorporated, Oklahoma City, OK. Vice-President and Regional Training Manager for Bank of America, Oklahoma City, OK. Senior Field Auditor for The Bankers Assurance, Oklahoma City, OK. Financial Accountant, Oklahoma City, OK.

Professional Memberships: Phi Kappa Phi, Kappa Delta Pi, Omicron Tau Theta, American Society of Training and Development, Mountain Plains Adult Education Association

Name: Jeffery Wayne Cooper Date of Degree: December, 2008

Institution: Oklahoma State University Location: Stillwater, Oklahoma

Title of Study: RELATIONSHIPS AMONG BEHAVIOR-PERSONALITY VARIABLES, PREFERRED LEARNING STRATEGIES, AND LEARNER CHARACTERISTICS IN THE WORKPLACE

Pages in Study: 263 Candidate for the Degree of Doctor of Philosophy

Major Field: Occupational Education Studies

Scope and Method of Study: The purpose of this study was to describe the behavior/personality and learning strategy profiles and their relationships among individuals in the corporate workforce in Oklahoma. The study was descriptive and used a self-report questionnaire methodology. The concept of needs-driven behavior/personality was measured with the *DiSC Personal Profiles System 2800 Series*. The concept of preferred learning strategy was measured with *Assessing the Learning Strategies of Adults (ATLAS).* Data were also collected on six demographic variables. The sample consisted of 124 participants from financial, information, and manufacturing industries in Oklahoma City, OK.

Findings and Conclusions: The behavior/personality profile of the workforce participants indicated approximately 70% of the participants clustered in 5 of the 16 identified profile patterns for the DiSC. Chi-square analysis of the learning strategy profile indicated that the distribution of this sample was different from the ATLAS norms. Crosstab analysis for DiSC by the demographic variables indicated a statistically significant relationship for DiSC by Age (p =.047). Crosstab analysis for ATLAS by demographic variables indicated a relationship for ATLAS by Industry (p =.068) that warrants further research. Cluster analysis revealed that the most appropriate solution for describing the participants in this study was a 3-cluster solution. Discriminant analysis identified the three cluster groups as: Cognitive Leaders, Affective Leaders, and Team Members. Crosstab analysis for the clusters by other variables indicated a statistically significant relationship for Clusters by Education (p =.009). Based on the findings, the following conclusions were drawn: (1) DiSC and ATLAS may measure discrete and unique constructs, (2) The relationship between preferred learning strategy (ATLAS) and personality/behavior (DiSC) may be complex and may require further study to evaluate, (3) Individuals in the sampled industries showed strong preference for five of the DiSC Classic profiles, and distribution may not be uniform across industries, (4) DiSC profiles may be related to age generations as defined by Strauss, (5) Preferred learning strategy may be related to industry in which employed and may not be uniform across industries, (6) There may be dissonance between workers' identified work roles and their preferred work roles, and (7) Work roles and preferences may be related to level of education attained.

ADVISER'S APPROVAL: Dr. Lynna J. Ausburn