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TRANSFERABLE SKILL ANALYSIS: UTILIZATION, METHODS, AND PERCEIVED SELF-EFFICACY BY REHABILITATION PROFESSIONALS, USING POISSON REGRESSION ANALYSIS OF COUNT DATA

Dissertation
Presented in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy in the Graduate School of The Ohio State University

By
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* * * * *

The Ohio State University
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ABSTRACT

This study involved a multivariate analysis of the casework of selected members of the Forensic Section of the International Association of Rehabilitation Professionals (IARP/FS). Seventy-five members were surveyed to see if relationships existed between the types of cases done and the methods and software programs used to do Transferable Skill Analysis (TSA). The units of analysis were the cases worked by the professionals contacted. Total number of cases worked by the participants was 13,164. Total number of cases on which TSA was done was 8,484.

Poisson regression was used to analyze relationships among the criterion variables. The criterion was a six by four matrix that represented the variations in use of Software Programs and TSA Method. There were nine matrices, one for each type of case type. The purpose of this study was to differentiate TSA methods and utilization patterns by case type, and to identify if perceived self-efficacy of the participants affected TSA applications.

No statistically significant relationship among these variables was found. Further, practitioner self-efficacy in the execution of TSA was also measured. Though the participants rated themselves highly confident in their ability to execute TSA and to use the results, no statistically significant relationship was found between
the perceived self-efficacy of the practitioner and the TSA Method, Software Program
Case Type applications.

Results suggest that other methods not based on software algorithms are used
56% of the time. Casework needs seem not to determine method or software
program.
This dissertation is dedicated to my wife Carolyn

whose time, energy and vision

provided the courage to complete this program.
ACKNOWLEDGMENTS

Many people have provided me with assistance along the way in the execution of this dissertation. I am grateful to Dr. Joe Wheaton for his insights and support, and to Dr. Bruce Growick who provided needed assistance with the original concept. I appreciate the good council and advice given by Dr. Michael Klein, and Dr. W. Bruce Walsh's support has been invaluable. Thanks are due to Dr. Karl Botterbusch for his time and answers to my many questions, which gave an historical perspective not otherwise possible.

The members of the International Association of Rehabilitation Professionals, their executive director Rob Teplansky, and particularly the members of the forensic section, deserve specific credit for their vision and dedication in support of research.

Rob Leighty and the staff and graduate assistants of the Statistical Consulting Service were kind and professional. Their contribution to this project is greatly appreciated.

However, without the unending support of my wife Carolyn, her understanding, and her professional vision, this dissertation would not be a reality.
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This chapter briefly describes forensic rehabilitation practice issues associated with the utilization of Transferable Skill Analysis (TSA) to assess when work skills transfer to other occupations. Labor market restructuring affecting persons with disabilities (Berkowitz, 1989; Kiernan, 1989; Trupin, Sebasta, Telin, and La Plant, 1997) and the requirement for a scientific basis in forensic testimony regarding TSA (Daubert v. Merrell Dow Pharmaceuticals, Inc., 1993; Kinnaman v. Ford Motor, 2000; Kumho Tire Co. v. Carmichael, 1999) have increased the need for a survey of current forensic rehabilitation practice in order to establish a base line for the study of empirically based protocols for TSA and best practice research. Data about present TSA practice methodology outside of the Social Security Administration (SSA) system is lacking. Thus, it is important to examine both the concept of TSA and its current application in forensic rehabilitation practice.

The classification of occupations in the United States has been and remains rooted in the trait-factor theory of person-to-job matching (Holland, 1959; Peterson, Mumford, Borman, Jeanneret, and Fleishman, 1999; Parsons, 1909; Roe, 1956; U. S. Department of Labor, 1991). Occupational classification systems are composed of
two types of data — data about the work being done and data about innate abilities that workers bring to the job in order to successfully do the work. The idea that work skill (i.e., abilities used in and reinforced by the performance of work) can be transferred to other occupations is a basic paradigm in forensic rehabilitation practice (Field & Weed, 1989).

This transfer concept is also fundamental to disability determination. At least since 1979, when the SSA medical-vocational grids were “amended to consolidate all policies for adjudicating disability claims in which an individual’s vocational factors must be considered in addition to medical condition” (Office of Hearings and Appeals, 1990, p. 36), TSA has been integral to the award of disability in this country. Its importance is reflected in the fact that a protocol of skill transfer is codified in the SSA administrative regulations. Rehabilitation professionals who practice outside of the Social Security system, however, do not have a universally acknowledged process by which to analyze work skill transfer to other occupations (Saxon and Spitznagel, 1995; Stewart, Chribon and Ososko, 1988; Truthan, 1989; Watters, 1984).

The Problem

The importance of TSA in the SSA system has influenced its utilization elsewhere. TSA is used in other disability-award systems (e.g., workers’ compensation), in a variety of legal proceedings (e.g., personal injury, medical malpractice, and divorce/custody), and in forensic testimony (Kontosh, 1995). However, the process, though codified and standardized by SSA, is not standardized
in other disability systems, nor is it specified in legal proceedings. The lack of a universal process is evident by the variety of coding options and levels of specificity of transfer that one is able to select when using skills transfer software (Botterbusch, 1986). Thus, questions arise regarding interrater reliability. How this critical analysis is done and how its findings are applied to forensic proceedings outside of the SSA system is necessary to complete an understanding of the TSA process.

Significance of the Study

Problems with the SSA definition of TSA, as it is applied to the present labor market, have been noted by several sources (Elliot, 1983; Truthan, 1989; Kontosh, 1995). Moreover, increased software utilization for the analysis of skill transfer in forensic rehabilitation practice suggests strict adherence to this definition may not any longer be the practice, because the software programs provide several ways to do the analysis.

Software programs that do TSA offer a variety of matching options and levels of specificity to accomplish TSA (Darling, Growick, and Kontosh, 2000). Given the variety of code combinations within these programs, it is possible using two different software programs, two different code cross matches, or two different levels of specificity within the same program to arrive at two different assessments of one individual's ability to transfer work skill (Truthan, 1989). The inconsistencies of assessment raise issues of the creditability and utility of the process.

Further, recent rulings of the U. S. Supreme Court regarding the scientific basis that is necessary for the rendering of expert testimony (Kumho Tire Co. v.
Çarmichael, 1999; Daubert v. Merrell Dow Pharmaceuticals, Inc., 1993) exposes rehabilitation professionals in forensic settings to questions about the scientific basis of TSA. The science that is applied to expert rehabilitation testimony regarding transferable skill analysis is open to cross-examination, thus reinforcing questions about interrater reliability and the validity of the process.

Purpose of the Study

This study examined the existing methodological processes, utilization patterns, and perceived levels of self-efficacy in executing transferable skill analysis (TSA) of rehabilitation professionals practicing in forensic settings. It surveyed the membership of the Forensic Section of the International Association of Rehabilitation Professionals (IARP/FS). The study focused on current practice patterns and perceptions of self-efficacy in the execution of the TSA process. The questions that were addressed were:

Do casework needs determine if TSA is used?

On which case types is TSA being applied?

What software programs are used in the TSA process?

What methods of TSA are being used?

Are there relationships that explain the variations software, methodology and utilization?

What is the perceived level of self-efficacy among rehabilitation professionals in executing TSA?
By surveying the forensic rehabilitation community and gathering data regarding current methods of doing TSA and the practice applications in which TSA is utilized, base-line data regarding current practices were obtained.

Research Questions and Variables

The research questions associated with this inquiry are:

Question 1 — Are there relationships which can be identified between the Software Programs used to do TSA analysis and the Method used to do the analysis?

Question 2 — Are there relationships that can be identified between the Case Types on which TSA is used and the Method selected?

Question 3 — Are there relationships between which Software Program is used to do TSA and the Case Types to which it is applied?

Question 4 — Are there relationships between perceived self-efficacy in executing TSA, and which Software Program is selected, the Methods used, and Case Types to which TSA is applied?

Descriptor Variables

1. The state in which the rehabilitation professional does most of his or her practice.
2. Number of years in the rehabilitation field.
3. Number of years doing forensics.
4. Highest education level.
5. Major of highest degree.
6. Professional certifications.
7. Professional memberships.
8. Use of TSA (i.e., yes or no).
9. TSA self-efficacy.
10. Number of cases done in 1998.

Criterion Variables

11. Case Type. This is the number of cases where TSA is used in selected case type groupings. These are count data.

12. Software Programs. This variable reflects the number of times a given software program was used to do TSA on a given case type. These are count data.

13. Methods. These data reflect the number of times a given method (i.e., software algorithm or other manual process) is used on a given case type.

Definition of Terms

The following definitions are offered for clarification.


2. SSA definition of transferable skill:

Transferability is most probable and meaningful among jobs in which—

a. the same or lessor degree of skill is required;

b. the same or similar tools and machines are used; and

c. the same or similar raw materials, products, processes, or services are used. (20 CFR 401.100 404.1568 (d)(2))
Implicit in this definition is the utilization of the following DOT codes structures: Specific Vocational Preparation (SVP); Work Field/Machines, Tools, Equipment, and Work Aides (WF/MTEWA); and Materials, Products, Subject Matter, and Services (MPSMS).

3. **Transferable Skill Analysis**: A systematic assessment process aimed at an objective evaluation of a person's ability to apply work skills used in and reinforced by one occupation to the successful performance of another occupation.

4. **Forensic rehabilitation**: A non case management type of practice where the focus of the applied skill of the rehabilitation professional is in the assessment of an individual's earning capacity, labor market access or life care needs, and the resultant assessment is to be utilized in a court proceeding or other legal matters.

5. **Forensic rehabilitation professionals**: The membership of the Forensic Section of the International Association of Rehabilitation Professionals (IARP/FS).

**Research Design**

A "one-shot" study design was used. Although Campbell and Stanley (1966) list the "one-shot" case study as pre-experimental, Campbell (Campbell, 1975) subsequently defends its usage in studies where explanation through pattern matching is desired. Its use in this study is appropriate because existing patterns of TSA execution are the focus of the research.

Threats to internal validity in this design are History, Maturation, Selection, and Mortality (Campbell & Stanley, 1966). The History threat suggests that events not measured by this study may cause the determination of the level of the dependent
variable. For example, business operations may be the cause of the selection of TSA software rather than the predictor variables in the study. The Maturation threat suggests that psychological variables of the respondents affect the dependent variable. For example, some TSA methods may be selected because of ease of use, which may be appealing to certain rehabilitation professionals. Selection is also recognized as a threat. The sample used in this survey is a convenience sample. Finally, Mortality as a threat is the concern that persons dropping out of the sample after agreeing to participate are different in one or more germane characteristics than those who do not drop out.

The threat to external validity in this design is principally the interaction of selection and the criterion variable (Campbell & Stanley, 1966). That is, the methodological and utilization patterns of this group may not be representative of the universe of all rehabilitation professionals because the sample was not selected from a frame of all practicing forensic rehabilitation professionals. This was a convenience sample randomly selected from the membership roster of IARP/FS.

Limitations of the Study

There are several limitations to this study. Although IARP/FS is recognized as a major professional organization for rehabilitation professionals who practice in forensic areas, they are not the only group that has as its members professionals who practice forensically. They are the largest group and the group which provides the easiest access by this researcher. Generalization was expected to be possible only to the IARP/FS membership and not to the universe of all forensic rehabilitation experts.
The results were expected to reflect only the opinions of this professional group. However, IARP/FS historically has a commitment to research in forensic rehabilitation. Because of this group's size and prominence, its practice options are significant to the understanding of TSA utilization.

Though this study did ask questions about education level, experience, and self-perceived TSA competence, no effort was made to objectively determine the professional's skill with regard to the execution or application of TSA. This study focused on selection of TSA processes, TSA utilization, and perceived levels of self-efficacy in the execution of TSA. The objective assessment of the skill of the professional and issues of interrater reliability in the use of TSA are beyond the scope of this study. Further, the accuracy and honesty of the persons completing and administrating the survey may limit this study. Some data may have been omitted, misrepresented, or wrongly coded.

From a methodological standpoint, this study is a descriptive study. It lacks a control group and thus is not experimental. Generalization of the results is limited to the membership of IARP/FS and not to the entire IARP membership or to the total forensic rehabilitation community. The conclusions reached are not causal.

Basic Assumptions

Because of the nature and importance of TSA to the forensic rehabilitation community, recent Supreme Court rulings, and presently active litigation surrounding TSA software, it was assumed that there would be a high rate of participation from IARP/FS and such was the case. Additionally, for this study the unit of analysis was
the case not the person. It was rightly assumed that a statistically significant number of cases would be obtainable from a sampling size of 75. Such turned out to be the case.

Summary

This chapter explained the problems with a perceived lack of standardization in TSA processes as used by rehabilitation professionals in forensic practice. It identified the risks to accurate conclusions and the need to establish a base for future research. It explained the need for studying the present utilization patterns of TSA software and other TSA methodologies as a means of addressing credibility and consistency.

This study assessed present forensic rehabilitation practice, and attempted to explain TSA utilization patterns. It generated baseline data needed for future investigation of empirically based protocols of TSA and the establishment of best practice.
CHAPTER 2

REVIEW OF THE LITERATURE

The purpose of this study was to investigate the methodological processes and utilization patterns of transferable skill analysis (TSA) as currently used in the forensic rehabilitation community and perceptions of rehabilitation counselors' (RC) self-efficacy in the execution and utilization of TSA. Literature in Occupational Classification (OC), vocational assessment and rehabilitation, business and education supports the critical nature of the understanding and identification of work skill. Literature in disability determination and forensic rehabilitation supports the existence of TSA protocols useful in forensic applications. Further, given the expanded and complex nature of the U. S. labor market, the self-efficacy of RCs practicing in forensic areas in the identification of skill and the analysis of skill transfer is paramount in light of recent U. S. Supreme Court rulings (Daubert v. Merrell Dow Pharmaceuticals, Inc., 1993; Kumho Tire Co. v. Carmichael, 1999) regarding the basis of expert testimony.

Introduction

This chapter presents a review of the literature arranged in four major areas: (a) literature related to the theory of career selection and OC to include Parson's,
Roe's and Holland's theories (Parsons, 1909; Roe, 1956; Holland, 1959) and two national classification systems—the Dictionary of Occupational Titles (DOT) (U. S. Department of Labor, 1991a) and the Occupational Information Network (O*NET) (Peterson, Mumford, Borman, Jeanneret & Fleishman, 1999); (b) literature related to work skill structure and identification; (c) literature related to work skill assessment and TSA as it is applied in disability determination and forensic rehabilitation; and (d) literature related to self-efficacy.

Early in this decade the Advisory Panel for the Dictionary of Occupational Titles (APDOT) (1993) reemphasized the importance of transferable skills. They indicated:

A new database system that highlights connections between occupations, emphasizes skills transferability, and links easily with related databases of education and labor market information is essential for the human resource management of the American economy. (Advisory Panel for the Dictionary of Occupational Titles, 1993b, p. 4).

If RCs are to be successful in aiding persons with disabilities in participating in the American economy to their fullest capabilities, an understanding of OC, skill identification, and their relationships to work skill transfer is an important issue for practicing vocational rehabilitation professionals.

Career Theory and Occupational Classification

Occupational Classification (OC) in the United States is fundamentally related to the theories and work done by three researchers: Parsons, Roe, and Holland. Each
Frank Parsons

Frank Parsons developed the trait-factor theory (Parsons, 1909). This theory is based on certain fundamentals that have formed a foundation for career counseling, exploration, and research. His theory of career choice was adopted for use by the Veterans Administration, the YMCA, the Jewish Vocational Services, and many colleges and universities (Picchioni, 1983). Parsons reasoned:

1. It is better to choose a vocation than merely to "hunt for a job."
2. No one should choose a vocation without careful self-analysis, thorough, honest, and under guidance.
3. The youth should have a large survey of the field of vocations, and not simply drop into the convenient or accidental position.
4. Expert advice, or the advice of men [sic] who have made a careful study of men [sic] and vocations and of the conditions of success, must be better and safer for a young man [sic] than the absence of it (Parsons, 1909, p. viii).

Thus began the era of vocational guidance and trait-factor matching of persons to occupations. Parsons' theory is a deceptively simple process based on three premises:
1. A clear understanding of one's self, in terms of aptitudes, abilities, interests, ambitions, resources, limitations, and their causes;

2. A knowledge of the requirements and conditions of success, and advantages and disadvantages, compensation, opportunities, and prospects in different lines of work; and

3. True reasoning on the relations of these two groups of facts (Parsons, 1909, p. 3).

Parsons established the basis for vocational counseling of the individual. He also established the need to gather and classify data about occupations.

The trait-factor theory is indomitable, and its effects are far reaching. Its concepts underlie OC, and it has legitimized matching as a theoretical concept. Key to this approach is the idea that individuals have a unique combination of abilities or traits that can be objectively measured and correlated with the requirements of various occupations. The theory also is the foundation of the vocational testing movement, and the basis for most vocational and interest tests. Further, this theory fostered a national interest in vocational guidance (Williamson, 1965), and is actively used in vocational rehabilitation (Schmitt & Growick, 1985).

Anne Roe

Roe continued a matching approach to career theory and attempted to integrate two disparate areas: personality theory and OC. Roe (Roe, 1956; Roe, 1990) viewed one's choice of occupation to be a function of a variety of factors. They include sex, general state of the economy, family background (including race and child-rearing
practices), learning and education, special acquired skills, physical capacity, chance, friends and peer group, marital situation, cognitive ability, temperament and personality, and interests and values. She argued that an individual's social inheritance is not limited to conditions such as family position and wealth. Rather, it also included the general situation of the community, the country and the part of the world in which the individual lives.

Roe also viewed occupations as related to individual differences in backgrounds, physical and psychological variables, and personal experiences. To describe career choice, she developed a multidimensional OC structure. The first dimension consists of occupational groups: service, business contact, organization, technology, outdoor, science, general culture, arts and entertainment. These groups are circularly arranged around the second dimension of two intersecting axes: (a) interpersonal relations versus natural phenomena, and (b) purposeful communication versus resourceful utilization. There is also a third dimension that intersects the second. It is a continuum of levels of responsibility, capacity, and skill. Each level involves a range of responsibilities, differences in the number and difficulty of decisions, and variety and types of problems to be addressed. These levels include (a) professional and managerial 1 (independent responsibility), (b) professional and managerial 2, (c) semiprofessional and small business, (d) skilled, (e) semiskilled, and (f) unskilled.

Roe reasoned that an individual's choice within the multiple dimensional classification was determined by an individual's interests and needs. She speculated
about the relationship between personality and vocation. First, child-rearing practices were hypothesized to satisfy, to varying degrees, children's needs (i.e., Maslow's hierarchy), thus causing those offspring to develop personality orientations "toward" or "not toward" people. Second, such orientations were postulated to directly influence an individual's vocational behavior. She offered several propositions to describe the origins of interests and needs:

1. Genetic inheritance sets limits on the potential development of all characteristics, but the specificity of the genetic control and the extent and nature of the limitation are different for different characteristics.

2. The degrees and avenues of development of inherited characteristics are affected not only by experience unique to the individual, but also by all aspects of the general cultural background and the socioeconomic position of the family.

3. The pattern of development of interests, attitudes, and other personality variables with relatively little or nonspecific genetic control is primarily determined by individual experiences, through which involuntary attention becomes channeled in particular directions.

4. These directions are first determined by the pattern of early satisfactions and frustrations. The relative strengths of various needs and the forms and relative degrees of satisfaction they receive affect this pattern.

5. The modes and degrees of need satisfaction determine which needs will become the strongest motivators.
6. The eventual pattern of psychic energies, in terms of attention-directedness, is the major determinant of interests.

7. The intensity of these needs, their satisfaction, and their organization are the major determinates of the degree of motivation that reaches expression in accomplishment (Roe, 1990, p. 78).

Roe's classification of work orientation as being "toward" or "not toward" people caused her to also classify occupations into groupings which repeat these choices. Roe, like Parsons before her, began with a study of the person and their occupational choices. She then applied insights regarding choice and vocational behavior to the grouping of jobs. Roe's theory attempts to match individual personality and jobs.

Research has not been able to support Roe's direct linkage of child-rearing style and specific occupational choice (Brown & Brooks, 1996). However, her work obviously has supported the use of temperaments, values, and interests inventories in vocational guidance. It has spawned an assessment battery widely used in job placement (e.g., COPESystem). And, it is reflected in the Occupational Employment Survey's (OES) classification of jobs by skill level (i.e., unskilled, semi skilled, and skilled).

**John Holland**

In terms of personality and job classification, Holland is another theorist who is important to the matching concept. His theory (Holland, 1959) sets out a typology of personalities and work environments. His interest in career theory began in 1942
and derived from what he thought was a tentative relationship between interest measurement and jobs, as well as, the cumbersomeness of OC (Weinrach, 1980). He posits that vocational interests are one aspect of personality. He reasoned vocational interests reflect and describe personality. There are four basic tenants:

1. Individuals can be classified as one of six personality types: realistic, investigative, artistic, social, enterprising or conventional (i.e., RIASEC).

2. There are also six environments, identically described.

3. Individuals search for environments that allow them to express their personalities through use of skills and abilities, to express their attitudes and values, and to address desired challenges and roles.

4. Behavior is a function of the interaction of personality and environment (Holland, 1985, pp. 2-4).

The six types (i.e., RIASEC) are arranged clockwise around a hexagon. Letter combinations that reflect the personality type or subtype describe both individuals and environments. Though it is possible for a person to belong to one single type, Holland's revisions of his theory suggest that subtypes of the six personalities exist. Individuals are usually a combination of the six types with one to three of the six predominating. Thus, a person with realistic, investigative and conventional characteristics is identified as RIC. Such a three-letter code indicates a profile, and is used to characterize persons and work environments (Holland, 1985).
Holland identified four concepts that form his empirical calculus and which are fundamental to the usefulness of his theory.

1. **Congruence**—This concept is the degree of fit between an individual's personality and the type or work environment, in which the person currently resides or anticipates residing. Incongruence exists when a person is working in an environment that is not close on the hexagon to their personality type.

2. **Consistency**—The relationships among the six types are not all of equal value. The closer the letters in the code are to each other on the hexagon the more consistent the personality is.

3. **Differentiation**—Individuals are more or less differentiated by the amount of resemblance they have to a single type versus equal resemblance to several types. The degree of differentiation is the degree of resemblance to the number of types. Thus, a person who has a resemblance equally to several types is said to be undifferentiated.

4. **Identity**—This concept is the degree to which a person has a clear understanding of their vocational goals and talents. If persons are interested in a variety of occupations, they are said to have a low level of vocational identity (Crabtree, 1971; Brown & Brooks, 1996, pp. 41-46).

The person-environment fit that Holland describes implies some change and adjustment in both individuals and the environments in which they work (Holland,
Persons are viewed though as relatively stable. They move in or out of new environments rationally only when the perceived fit is no longer optimal (Costa, McCrea & Holland, 1984).

Holland recognizes that there are other variables that influence occupational selection. He identifies intelligence, gender, and social class as not only effecting the stability of a career and how it may change, but as also influencing the development of personality and thus, occupational preference. Roe seemingly has influenced Holland's premise that personality affects occupational choice.

Fundamental to the application of Holland's theory is the understanding of his OC system. It arranges occupations by the psychological similarities of the workers who are in the occupation. Occupations are categorized into one of the six major groups (i.e., RIASEC) and also into subgroups. Three ways have been identified to use the Holland Occupational Classification System (Helms, 1973). It can be used to (a) organize occupational information, (b) analyze work histories, and (c) develop career exploration plans. Holland's theory has evolved over time. Though more than 450 studies (Brown, 1990), its validity and reliability have been well established.

Each of these three theories has made significant contributions to vocational guidance. As adopted historically and presently by the DOL, OC borrows from each as well. From Parsons (Parsons, 1909) the concept of matching of information about persons and occupations is foundational to both the DOT (U. S. Department of Labor, 1991a) and the O*NET (Peterson, et al., 1995). From Roe (Roe, 1956; Roe, 1990) the idea that occupations can be stratified across job clusters according to levels of
responsibility, capacity and skill is the method used by DOL to address job complexity, job training time and skill level. Further, the usefulness of a person's temperaments, values and interest as an organizing schema is also present in both DOT and O*NET. From Holland (Holland, 1959; Holland, 1973; Holland, 1985; Holland, 1997) the idea that work interest as expressed by occupational choice is an important aspect of personality has in the DOT been conceptually followed and is reflected in the Guide for Occupational Exploration (GOE). Actually, the GOE structure is somewhat different than Holland's schema. However, Holland's taxonomy has been directly adopted by the DOL as the interest dimension in the O*NET (Peterson, et al., 1995).

Occupational Classification gathers information about jobs and the abilities needed to do them. There are presently two systems in use at this time.

The Dictionary of Occupational Titles

A job can be performed in a variety of ways. Due to technological, economic, and sociological influences, jobs are not identical across the labor market. In order to study jobs in an organized way, OC groups jobs into "occupations" based on similarities in function and structure by utilizing collective descriptions of the individual jobs (U. S. Department of Labor, 1972; U. S. Department of Labor, 1991b).

As a function of government, OC begins in this country in 1933 with the enactment of the Wagner-Peyser Act that established the federal-state system of public employment services (Peterson, et al., 1995). A classification system of jobs was
needed so that uniformity was created in developing job information for use in matching people to job opportunities. The first edition of the DOT was published in 1939 and subsequently in 1942, 1944, and 1945. A second edition was published in 1949, the third in 1965, the fourth in 1977 and the final update of the fourth in 1991 (Peterson, et al., 1995). For more than sixty years since the DOT was first published, rehabilitation professionals have relied on the DOT (Wright, 1980). It has enabled RCs to examine the relationship between the physical and intellectual demands of 12,741 occupations, and the physical and intellectual capacities of the client.

Each of the titles in the DOT is described in detail by title and definition, and is afforded a nine-digit code for identification purposes. The code breaks down as follows. The first three digits form the Occupational Group Arrangement (OGA), and each occupation is assigned a category, division, and group. For example, occupations are divided among nine occupational categories (the first digit of the code). For each category, the DOT provides subcategories called divisions. Each division is further divided into homogeneous occupational groups. Looking at the code for rehabilitation counselor, 045.107-042, one concludes that this is a professional occupation (from the first digit-0); this is a profession in the life sciences (from the second digit-4); and that is a profession in life science dealing with psychology (the third digit-5; U. S. Department of Labor, 1991a).

The second three digits of the code refer to the worker functions of each job, and form the data-people-things arrangement (DPT). All work relates to some degree to data, people, or things. Worker Functions expresses these relationships in implied
hierarchical levels and numbers are assigned to indicate the complexity of the relationship: the higher the number the more complex the interaction (U. S. Department of Labor, 1991a). The original DPT concept inferred that jobs that required higher levels of these functions also required the functional interaction below it. Since these functions indicate skill capability, it is useful to review the full structure as presented in Table 2.1.

<table>
<thead>
<tr>
<th>Data</th>
<th>People</th>
<th>Things</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Synthesizing</td>
<td>0 Mentoring</td>
<td>0 Setting Up</td>
</tr>
<tr>
<td>1 Coordinating</td>
<td>1 Negotiating</td>
<td>1 Precision working</td>
</tr>
<tr>
<td>2 Analyzing</td>
<td>2 Instructing</td>
<td>2 Operating-Controlling</td>
</tr>
<tr>
<td>3 Compiling</td>
<td>3 Supervising</td>
<td>3 Driving-Operating</td>
</tr>
<tr>
<td>4 Computing</td>
<td>4 Diverting</td>
<td>4 Manipulating</td>
</tr>
<tr>
<td>5 Copying</td>
<td>5 Persuading</td>
<td>5 Tending</td>
</tr>
<tr>
<td>6 Comparing</td>
<td>6 Speaking-Signaling</td>
<td>6 Feeding-Offbearing</td>
</tr>
<tr>
<td>7 Serving</td>
<td></td>
<td>7 Handling</td>
</tr>
<tr>
<td>8 Taking Instructions-Helping</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2.1: Data, People, and Things Arrangement (U. S. Department of Labor, 1972, p. 5)
Looking again at the code for rehabilitation counselor, the 107 in the code 045.107-042 indicates that the worker's relationship to data is coordinating, to people is mentoring, and to things is handling. Additionally, one concludes that coordinating data and mentoring people are higher functions than handling things. Further, the ability to coordinate data, for example, implies the ability to do the functions below it as well.

The last three digits of the nine-digit code are assigned differentially to form a unique nine-digit code. They aid in discriminating among closely related jobs with the same initial six digits in the code. For example, the code for a residence counselor is 045.107-038. Rehabilitation Counselor is coded 045.107-042. The purpose of grouping titles in this manner is to facilitate exploration. Scanning closely coded titles can provide additional options to consider. Additionally, to identify other occupational choices for a client interested in professional work in psychology (i.e., OGA 045), the RC can review the broader occupational category of professionals in life science (i.e., OGA 04) for additional options (U. S. Department of Labor, 1991a, pp. 46-52).

Additionally, the DOT also provides data about occupational demands. The job analysis process gathers these data, and they add to the OGA structure a significant amount of information about job factors and worker traits. The data are arranged in two broad categories of information: Work Performed data and Worker Trait data (U. S. Department of Labor, 1972; U. S. Department of Labor, 1991b).
The Work Performed data consists of two subcategories: Work Field; and Material, Products, Subject Matter, and Services. Likewise there are subcategories of Worker Trait data: Training Time, Aptitudes, Temperaments, Interests, Physical Demands and Environmental Conditions. It is useful in understanding the concept of work skill to look at each of these subcategories individually.

Work Fields reflect two types of data: work method and tools used. There are one hundred Work Fields identified which classify each of the occupations listed in the DOT. Each Work Field has a title, definition, and a three-digit number. Further each field identifies the method of work performance by using a descriptive methods verb and the instruments and devices which are used to carry out the work (i.e., Machines, Tools, Equipment, and Work Aids) to best describe the technology with which the worker is involved.

The second subcategory of Work Performed data is Materials, Products, Subject Matter, and Services. These data reflect content from the Standard Industrial Classification Manual (U. S. Office of Management and Budget, 1987; U. S. Department of Labor, 1972), and classify work by the end product of the effort. There are 580 categories divided into 55 groups. A three-digit number identifies each category; for example, 770 Social Science.

Work Performed data is task-based data. It addresses the processes and functions of enterprise-orientated activity. It identifies the end product of work and the tools used to execute the job.
The second broad category of data collected by job analysis and found in the DOT is Worker Traits. The data are arranged into five subcategories: (a) Training time, (b) Aptitudes, (c) Temperaments, (d) Interests, (e) Physical Demands and Environmental Conditions.

Training Time is the required amount of General Educational Development (GED) and Specific Vocational Preparation (SVP) needed by the worker to adequately perform in a specific work situation. GED is the formal and informal education that the worker needs in three areas: reasoning, math, and language. SVP is the time in months needed to achieve an average level of job performance.

Aptitudes are the specific capacities needed of the worker in order to adequately learn the job. The following aptitudes are identified: General Intelligence, Verbal Aptitude, Numerical Aptitude, Spatial Aptitude, Form Perception, Clerical Perception, Motor Coordination, Finger Dexterity, Manual Dexterity, Eye-Hand-Foot Coordination and Color Discrimination.

Temperaments are "personal traits" which the worker needs in specific job-worker situations (U. S. Department of Labor, 1991b). They are defined in the following ten factors: (a) adaptability to accepting responsibility for the direction, control, or planning of an activity; (b) adaptability to situations involving the interpretation of feelings, ideas, or facts in terms of personal viewpoint; (c) adaptability to influencing people in their opinions, attitudes, or judgements about ideas or things; (d) adaptability to making generalization, evaluations, or decisions based on sensory or judgmental criteria; (e) adaptability to making generalizations, or
decisions based on measurable or verifiable criteria; (f) adaptability to dealing with people beyond giving and receiving instructions; (g) adaptability to performing repetitive work, or to performing continuously the same work according to set procedures, sequence, or pace; (h) adaptability to performing under stress when confronted with emergency, critical, unusual, or dangerous situations; or situations in which working speed and sustained attention are make-or-break aspects of the job; (i) adaptability to situations requiring the precise attainment of set limits, tolerances, or standards; and (j) adaptability to performing a variety of duties, often changing from one task to another of a different nature without loss of efficiency or composure.

Interests are seen as those activities in which a worker becomes absorbed versus those activities in which the worker is likely to avoid or has an aversion to. There are 5 dichotomous selections: (a) a preference for activities dealing with things and objects versus a preference for activities concerned with the communication of data; (b) a preference for activities involving business contact with people versus a preference for activities of a scientific and technical nature; (c) a preference for activities of a routine, concrete, organized nature versus a preference for activities of an abstract and creative nature; (d) a preference for working for the presumed good of people versus a preference for activities that are carried on in relation to processes, machines, and techniques; and (e) a preference for activities resulting in prestige or the esteem of others versus a preference for activities resulting in tangible, productive satisfaction.
Physical Demands are the physical requirements of a specific occupation. They are: (a) strength (i.e., lifting, carrying, pushing or pulling), which is rated as sedentary, light, medium, heavy, or very heavy; (b) climbing and/or balancing; (c) stooping, kneeling, crouching and/or crawling; (d) reaching, handling, fingering, and/or feeling; (e) talking, and/or hearing; and (f) seeing. The latter traits (i.e., b through f) are rated by how often they are likely to be done on the job (i.e., never, occasionally, frequently or constantly).

Environmental Conditions are the physical surroundings of the occupation, which make specific demands on the worker. They are: (a) work location (i.e., inside, outside or both); (b) extreme cold with or without temperature changes; (c) extreme heat with or without temperature changes; (d) wet or humid conditions; (e) noise or vibrations; (f) hazards; and (g) atmospheric conditions.

Work Performed data and Worker Trait data clearly repeat Parsons (Parsons, 1909) matching concept. They satisfy the first two premises of this theory. The matching concept was introduced into to OC in 1939 and continues through the fourth edition (U. S. Department of Labor, 1991a).

The DOT has three occupational arrangements that allow the user to access the dictionary in several ways. The primary arrangement is the occupational group arrangement (OGA), previously discussed. The second occupational arrangement is the alphabetical index of occupational titles. Each definition is given a unique occupational title, and as appropriate alternative titles. All titles, main and alternative, are arranged alphabetically for ease of selection by name of occupation. The third
occupational arrangement is the index of occupational titles arranged by industry designation. The DOT identifies a large number of industries. The index arranges each title under the industry in which it is found. Some of the DOT industries are relevant to the present-day labor market (e.g., financial institutions). Others are either not significant due to structural changes in the economy (e.g., Hat and Cap Industry), or have been purposely generalized so that occupations categorized within apply to many industries (e.g., Any Industry). Whichever the case, the usefulness of this industry arrangement is limited.

This limitation is one of several shortcomings noted of the DOT. Growth of end-user need for occupational information is another (Peterson, et al., 1995). Further, the DOT has proven cumbersome to update and to keep current with the fast changing labor market. Often, new occupation codes would appear in the DOT long after their existence in the economy (e.g., fast food worker first appeared in 1977). Thus, the need for an electronically based system was identified. Additionally, the limitations of a task-based, dictionary type system become more evident as workplace changes increase.

According to APDOT (Advisory Panel for the Dictionary of Occupational Titles, 1993a), the purpose of OC should be to promote effective education, training, counseling, and employment in the American workforce. Furthermore, they recommended that the DOT should be restructured to accomplish this purpose by means of a relational database system that identifies, defines, classifies, and describes occupations in an accessible and flexible manner. The panel also stated that the DOT
should serve as a national benchmark that provides a common language for all users of occupational information. They concluded that the DOL should reinvent the DOT in the context of the Administration's national economic investment strategy thereby helping America to regain its competitiveness and revitalize its workforce (Advisory Panel for the Dictionary of Occupational Titles, 1993).

Extensive societal and economic changes have taken place since the DOT was first published. The economy has changed from an emphasis on blue-collar, manufacturing jobs to white-collar jobs; toward information and services and away from heavy industry. In keeping with this trend, O*NET is in the process of replacing the DOT.

The Occupational Information Network

The Occupational Classification Network (O*NET) is a relational database that has a software viewer that runs on Windows-based personal computers. It contains information on the knowledge, skills, abilities, interests, preparation, contexts, and tasks associated with 1,122 occupations. Although this number pales compared with the DOT's 12,741 occupations, many of the original DOT titles no longer exist or employ few people. The O*NET does not describe, for example, obscure occupations such as chick grader or alarm mechanism adjuster (Mariani, 1999). The O*NET offers a more dynamic framework for exploring the world of work. Using O*NET, employers, teachers, rehabilitation professionals, and others can access critical information for vocational decision-making (Mumford & Peterson, 1999).
During the mid 1990's, a team of public and private sector organizations, led by the U. S. DOL Employment and Training Administration (ETA), created O*NET (Peterson, et al., 1995). The ETA version of O*NET appeared on a limited basis in December 1997. A refined version, O*NET 98, was made available to the public in December 1998. The full version is expected by 2001. The comprehensive information in O*NET is organized in a relational manner, and is available on CD-ROM, diskettes and Internet download (Peterson, et al., 1995).

The O*NET is an improvement compared with the DOT in a number of ways (Mariani, 1999). It focuses on transferable skills, making it easy to group jobs into related clusters and explore career paths across clusters. The database uses a standardized OC system directly linked to labor market data that are vital to making informed employment decisions. The use of a standardized classification system facilitates links between O*NET and other data sources, such as the Occupational Outlook Handbook. Moreover, O*NET identifies knowledge and specific instructional programs required for occupations, thereby stressing the connection between school and work. In addition to providing for rapid occupational data updates, O*NET makes it possible for users to rearrange data according to their individual needs (U. S. Department of Labor, 1998; Mariani, 1999).

O*NET 98 includes: data describing over 1,100 occupations; the capability to locate occupations through skill requirements or key words; electronic links that link O*NET occupational titles to eight other classification systems (e.g., DOT, the Military Occupational Specialty System [MOS], and Office of Personal Management-
Civil Service); labor market information from the Bureau of Labor Statistics (BLS) on employment levels, occupational outlook, and wages; and occupational profiles which offer a brief overview of the most important data descriptions on each occupation (Mariani, 1999; Peterson, et al., 1999; Peterson, et al., 1995; Mumford & Peterson, 1999).

The O*NET viewer software permits users to view concise occupational profiles describing the most important characteristics of an occupation. Users are also able to access the entire database. For each occupation, the O*NET 98 program offers ratings for 483 variables. Information is organized according to a content model consisting of six domains (Mumford & Peterson, 1999).

First Domain. The Worker Characteristics domain represents the abilities, interests, and work values associated with workers in different occupations. There are two numeric ratings for each of the fifty-two O*NET abilities. One rating indicates the level of each ability needed, the other rating measures the importance of that ability in performing the work. A large portion of this domain contains DOT data imported into the new system. This data exchange is necessary until job analyses in the O*NET process reach a critical mass and DOT data exchange can cease. Each occupation has special ratings for interests and work values. The O*NET provides occupational interest profiles in the Holland model of personality types and work environments. The O*NET occupational profiles identify one or two of the most relevant codes for each occupation. Furthermore, each occupational profile displays
one or two of the highest rated of O*NET's set of work values. These values come 
from the Minnesota Job Description Questionnaire (Dawis, 1984).

**Second Domain.** The Worker Requirements domain includes education, 
knowledge, basic skills, and cross-functional skills. Each of these elements is directly 
impacted as a result of learning and experience. The O*NET defines educational 
requirements by citing instructional programs required to perform in an occupation, as 
well as, knowledge areas required. The O*NET rates each occupation according to 46 
skills based on a level of "basic" and "transferable" skill required and their 
importance in performing the work (Mumford & Peterson, 1999). Examples of basic 
skills are reading comprehension, mathematics, and critical thinking. Examples of 
transferable, or cross-functional, skills are negotiation, troubleshooting, and time 
management (Mariani, 1999). In contrast to the task-based DOT, which described a 
worker's functions in relation to people, data, and things, O*NET is skill-based. 
Using 483 variables, the O*NET describes job requirements and worker attributes, as 
well as, content and context of work.

**Third Domain.** The Experience Requirements domain involves license and 
preparation requirements. The current database, O*NET 98, assigns each occupation 
to one of five job zones. Job zones indicate the amount of experience, education, and 
training a worker needs to perform in an occupation. These job zones resemble the 
education and training categories used by the BLS. Each occupational profile specifies 
a job zone with three statements describing the necessary education, experience, and 
job training. If appropriate, it also stipulates apprenticeship training needed. An
important distinction is made about this set of educational statements versus the ones found in domain two. The education statements in the Experience Requirements domain cite educational level, while Worker Requirements describe instructional programs. Information on licensure requirements will not appear on the O*NET database, rather in the future it will link with other databases that provide state-specific licensing information (Peterson, et al., 1999).

**Fourth Domain.** In the Occupational Requirements domain, O*NET stores information about work activities, generic tasks, or job behaviors that apply across occupations. As a result of its continued evolution, O*NET will eventually provide more information on organizational and work contexts in the occupation requirements domain. Each occupation is rated according to 42 work activities based on importance, frequency, and level. The O*NET 2001 database will include organizational context. There will be 51 organizational characteristics reflecting how people do their work, including information on employee empowerment, team structure, and decentralization. Although O*NET 98 includes some information on work context, the 2001 database will provide 46 physical and social factors influencing the nature of work, such as pace and scheduling, work attire, and environmental conditions which will also include job hazards (Mariani, 1999).

**Fifth Domain.** The Occupation-Specific Requirements domain provides information specific to each occupation. The other domains describe specific occupations by assigning unique ratings, but the variables are identical for every occupation. To distinguish among all the 1,122 occupations, this domain accounts for
information unique to individual occupations. Eventually, O*NET will include five types of occupation specific information: occupational knowledge; occupational skills; tasks; duties; and machines, tools, and equipment used (Mumford & Peterson, 1999; Peterson, et al., 1999).

**Sixth Domain.** The Occupation Characteristics domain is not yet fully implemented, but it will include labor market data, employment projections, and earnings data. The O*NET 98 contains national occupational employment projections from the BLS and wage data from the OES and Current Population Survey. O*NET 2001 will link to other databases in order to provide regional and local data.

**Unique O*NET Concepts.** Unique to the O*NET as a classification system, is a concept allowable due to the development of computer technology. O*NET creates a foundation upon which developers may build add-on software applications for work-related purposes. Rather than accessing data via the built-in O*NET viewer, most future users will see O*NET data repackaged in privately and publicly developed add-on software programs (Mariani, 1999) These add-on programs are critical resources for TSA evaluations for vocational rehabilitation professionals. As has been shown, the differences between the DOT and O*NET are significant. Most of the improvements are able to be implemented because of advancements made in computer technology. Mariani (Mariani, 1999) makes a succinct comparison between the two systems in Table 2.2.
<table>
<thead>
<tr>
<th>DOT</th>
<th>O*NET</th>
</tr>
</thead>
<tbody>
<tr>
<td>Book</td>
<td>Relational Database</td>
</tr>
<tr>
<td>Fixed Format</td>
<td>Flexible System, allows users to reconfigure</td>
</tr>
<tr>
<td>Reflects Industrial Economy</td>
<td>Reflects today's labor market</td>
</tr>
<tr>
<td>Focus: Blue Collar workers</td>
<td>Focus: Multi skilled worker</td>
</tr>
<tr>
<td>Task-based</td>
<td>Skills based</td>
</tr>
<tr>
<td>Isolated definitions</td>
<td>System linked to labor market</td>
</tr>
<tr>
<td>Requires complex crosswalks to other systems</td>
<td>Standard Occupational coding eases direct links to other systems</td>
</tr>
<tr>
<td>No measure of TSA</td>
<td>Gauges TSA</td>
</tr>
<tr>
<td>Difficult to create</td>
<td>Easy to create job cluster/career paths</td>
</tr>
<tr>
<td>Difficult to up date</td>
<td>Easy to up date</td>
</tr>
</tbody>
</table>

Table 2.2: DOT and O*NET—A Comparison (Mariani, 1999)

Because occupational data is useful to many users, various crosswalks have developed to allow basic occupational data in the DOT to link with other data bases.
developed by end users to serve other needs. This linkage is continued in the O*NET system. Occupational data continues to grow in importance as evidenced by the number of end users and constituencies consulted in the DOT's redevelopment (Advisory Panel for the Dictionary of Occupational Titles, 1993a).

Crosswalks to Other Systems

Historically, OC has maintained crosswalks to other government classification systems. These crosswalks serve a variety of purposes for an equally varied group of end users. Both the DOT and O*NET have crosswalks to other systems. It is important to discuss each of the following crosswalks: The Guide for Occupational Exploration (GOE), the Standard Occupation Classification (SOC), the Standard Industrial classification (SIC), Classification of Instructional Program (CIP), and the OES matrix classification system.

These crosswalks and other classification systems are maintained by the National Occupational Information Coordinating Committee (NOICC), a joint Federal agency that maintains the National Crosswalk & Data Center (NCDC) (National Occupational Information Coordinating Committee, 1999). NCDC is tasked with the maintenance of the crosswalks, but not in the development of the classification systems, which are developed by the agencies that publish them. Of the above crosswalks, the GOE is not currently maintained. Its consideration here is for historical purposes related to the early identification in OC of the place interests play in career selection, and because initially it is still included in the group of O*NET crosswalks.
The GOE was originally organized for the Federal-State Employment Service System (USES) to help job applicants see themselves "realistically" in relation to job requirements (U. S. Department of Labor, 1979). It classifies by occupational group interests, aptitudes, adaptabilities, and other job requisites. Persons presenting for placement at job services offices could compare what was known about jobs with what the applicant knew about him or herself. The structure of the GOE is derived from earlier data gathered to develop The USES Interest Inventory. Bob Droege is credited with the structure development (K. F. Botterbusch, personal communication, July 19, 1999). This database organizes occupational data into 12 interests areas, 66 work groups, and 348 subgroups. Interests areas are both broad interest requirements of occupations and the vocational interests of individuals. These areas are represented by a two-digit code (e.g., 01—interest in creative expressions of feelings or ideas).

Work groups are found within each interest areas. These groups contain jobs of the same general type of work and require the same "adaptabilities and capabilities of the worker" (U. S. Department of Labor, 1979) (e.g., 01.01 Literary Arts). Within each work group are found subgroups so that jobs are easier to distinguish for the applicant (e.g., 01.01.01 Editing). Each subgroup contains alphabetical listings of jobs by industry designation. Descriptions of each job indicate job activities, requirements of the worker, "clues" for relating the individual to the type of work, and preparation necessary. Further, each of the occupational titles included in the DOT is also included in the GOE within the appropriate subgroup. The utilization of
the GOE has waned in favor of the Holland structure which is the chosen interest taxonomy in the O*NET (Peterson, et al., 1995).

The SOC is used for the standardization of statistical analysis and presentation of data about occupations (U. S. Department of Commerce, 1980). It was developed by an interagency OC committee of data users (e.g., Employment and Training Administration, Health Resources Administration, Bureau of the Census, and others). It is structured on a four-level system—division, major group, and minor group and unit group. The levels are groups that are increasingly more specific in detail. Each group links DOT titles that are descriptive of the group. For example, Health Diagnosing and Treating Practitioners (Division), 26 Physicians and Dentists (Major Group), 261 Physicians (Minor Group), Pathologist 070.061-010 (Occupational title and Code). The intent of the development of the SOC was to provide a cross-reference and structure for aggregating occupational data by fields of work that could be used across agencies. Presently, the SOC is under revision. The new version will represent a unified classification system and will be published for use in the 2000 census. The Bureau of the Census uses the SOC as the OC system for its on-going household surveys, as well as, the ten-year census (U. S. Bureau of the Census, 1999).

The SIC is the system which forms the basis for all federal statistical programs which classify data by establishment (i.e., work place). It is used to insure that data gathered on various parts and activities of the economy is comparable. It attempts to cover all aspects of the economy, and its structure is comprehensive. The
SIC is published by the Office of Management and Budget. The SIC is governed by several principles: (a) The SIC conforms to the structure of American business; (b) Establishments are classified by their principle activity; (c) To be recognized, a group of establishments in one industry must be statistically significant regarding the numbers of employees, and volume of business (U. S. Office of Management and Budget, 1987; U. S. Office of Management and Budget, 1972). The SIC divides the economy into 11 divisions (e.g., Services, Mining). Each division contains two-digit major groups, three-digit industry groups, or four-digit industry codes. Each grouping is successfully more detailed. Thus, in Division 1 (read eye) Services, there are Major Groupings for Personal Services (72) and Business Services (73). Within Group 73 there are Industry Groupings for Advertising (731) and Consumer Credit Reporting Agencies (732). Finally, Advertising is subdivided into Industry (e.g., 7311 Advertising Agencies, 7312 Outdoor Advertising Services) (U. S. Office of Management and Budget, 1987). The DOT crosswalks to this taxonomy in an effect to link occupational titles to the industries in which they are located.

The CIP (U. S. Department of Education, 1990) is a creation of the Office of Educational Statistics and classifies instructional program by type and amount. The “amount” class indicates categories such as high school, undergraduate, or graduate. The “type” class indicates the type of academic or occupation-specific instruction found in the program. This class has three levels of specificity. The most general level lists program categories. The next most specific level lists subdivisions of these categories. And, the most specific list provides additional subsets. Thus,
rehabilitation-counseling programs are assigned 17.0307 indicating an allied Health program (17), a Mental Health/Human Service (03) and Rehabilitation Counseling (07). The O*NET has in part adopted this taxonomy for use, and all occupational titles in the DOT have been crosswalked to it.

The OES classification system is used by BLS to gather data about employment growth and to support the National Industry-Occupational Matrix that reports wage and salary data for 240 industries and 500 occupations. This data is updated on a three year cycle that yearly surveys 1/3 of the economy on a rotating basis. This system is the classification system that presently updates most frequently (Bureau of Labor Statistics, 1999). The titles in the DOT and O*NET are also cross-walked to this system.

It is notable that the above mentioned systems are not the only systems which the NCDC maintains. Clearly the complexity of the effort to link multiple-user systems that have a variety of structures for classification strongly supports the government's need for occupational information for a variety of purposes. Further, as the needs of the various constituent groups increase, the complexity of the effort to maintain usability across databases grows as well.

Occupational Classification and its related crosswalks have become more reflective of the labor market. O*NET now services its constituency groups better (Peterson, et al., 1999). It is a proactive, interactive database rather than reactive dictionary. O*NET is skill-based rather than task-based, and directly identifies transferable skills.
The importance of skill-based classification and the identification of the skills needed in the 21st century labor market are fundamental to worker competitiveness. Thus, skill identification in rehabilitation planning continues to be important to rehabilitation outcomes.

Work Skill Structure and Identification

Those abilities that are directly applicable in the workplace have been changing as fast as the structural changes in the U.S. economy. This section will highlight several skill structures that have made significant contributions to the understanding of work skill in vocational rehabilitation.

Skill Structure in Occupational Classification

Skill as a worker trait or as work function is basic to OC. Since the early development of OC, skill has been a defining concept which has driven the process of job classification.

Skill as Defined in the DOT. As reported above, the DOT, by the data it indexes and the groupings it creates, focuses on worker traits (i.e., innate abilities) as they are applied to work process (i.e., Work Field, Work Tools, Work Outcomes). The relationship between Worker Trait data and Work Performed data is fundamental to task-based occupational classification systems. In the DOT, this relationship is expressed by the sentence analysis technique. The technique is used to describe the job-worker situation in brief declarative sentences. This technique uses the following four steps.

1. The subject is always the worker, implied but not expressed.
2. The verb, which always begins the sentence, is synonymous with the worker function.

3. The immediate object is data, people, or thing. If data, the object is information. If people, the object is the person to whom a service is rendered. If a thing, then the objects are the machine, tool, equipment or work aid through which the active of the verb is performed.

4. The job description is written in sequence.

For example, "Takes instructions (worker function) from supervisor (people) to dry (work filed) coal (material)" (U. S. Department of Labor, 1972, p. 7). This sentence is a statement of the application of worker trait to work process or a statement of work skill.

The DPT arrangement has also been used as a way to identify skill (Wright, 1980; Saxon & Roberts, 1983; Saxon & Spitznagel, 1995). These data reflect the occupational need to exercise more complex responsibility and judgement. By definition they are hierarchical. The lower the numerical rating the higher level of skill, and that skill includes not only the rated level, but the functions below it as well.

However, Field and Field (Field & Field, 1983) have found that though there is some support for the hierarchy and suspected correlations with other worker traits, there are questionable relationships between the higher levels of worker functions and the higher levels of the reasoning, math and language levels of General Educational Development (GED) factor. They conclude that job selection based on the DPT
rational may not totally yield jobs in line with the client's ability level. The stated DPT hierarchical relationship is not conclusive. Field and Field (Field & Field, 1983) argue that it would be expected that there would correlative relationships between the DPT arrangement and other worker trait factors (i.e., Specific Vocational Preparation (SVP), aptitudes, interests and temperaments). That is, jobs that require the higher DPT levels also would require higher levels of these other worker traits.

**Skill as Defined in the O*NET.** O*NET takes a substantially different approach to skill (Mumford & Peterson, 1999). A distinction is made between ability, competency, and skill. Abilities are enduring attributes of a person's capability for performing a particular range of different tasks. They are regarded as traits.

Competencies relate to quality of work performance and are underlying personal characteristics that are "causally related to superior performance" (Mumford & Peterson, 1999, p. 175). The O*NET has adopted as the definition of competency, a concept of cross-functional skill which reflects what people do across a wide range of jobs.

Skills are different than either of the two above categories. They are inferred from individual performance across a variety of work tasks. Skills are a function of learning and represent learned behavior through training. Skills are situational and improve over time. The acquisition of a skill and its future development are a function of the individual's underlying abilities and potential to learn and acquire knowledge.
In the O*NET, skill is not seen as the application of ability to task. Through that dimension is not ignored by O*NET, it is not looked at as skill. Skill is a transferable concept by definition, as differentiated from occupationally specific talents, which require the application of ability to task.

**Skill Identification in Vocational Rehabilitation**

Because RCs are frequently involved in job placement, work skills traditionally have been seen as traits applied to work process (Wright, 1980). Maximizing the employment outcomes for persons with disabilities often means skill acquisition as a part of the rehabilitation plan. The initial stage of the vocational rehabilitation process, the evaluation phase, is directed toward determining current and potential client functioning, skills, and interests for the purpose of identifying job-to-client matches and a vocational goal for the rehabilitation plan.

A vocational evaluation is often used to identify the potential for rehabilitation success and options to be considered by the person with a disability. Vocational evaluation sets out to identify all possible traits and abilities, and the maximum of each. Once identified, the evaluation looks at the person's ability to apply the abilities to work process. Thus, vocational evaluation relies heavily on work samples and situational assessment (Neff, 1985; Pruitt, 1986, Power, 1999).

The concept of skill being applied ability to task has been historically used in vocational rehabilitation, and has been widely accepted (Wright, 1980; Watters, 1984; Wesolek & McFarlane, 1992; Williams, 1998, Power, 1999). However, the dramatic changes in the labor market have caused abilities, processes, and the ways skill is
applied to have changed significantly (U. S. Department of Labor, 1992b). Labor force development and education have became critical to participation in the global economy. Thus, skill and its identification have undergone a major restructuring. As far back as 1988, the federal government recognized the problem of workplace literacy and skill acquisition (U. S. Departments of Education and Labor, 1988). Changing demographics were setting new trends. An older, less adaptable workforce was facing a job market that required increasingly flexible skills, with many workers changing jobs five or six times during their lives. Additionally, less skilled groups and underutilized population groups (e.g., women, minorities, persons with disabilities, and immigrants) were needed to fill available jobs. As a consequence of smaller growth in the labor force and a diminishing pool of qualified workers, employers were facing serious skill and labor pool shortages not experienced since WWII (U. S. Departments of Education and Labor, 1988). By 1990, The National Center on Education and the Economy identified that the U. S. lacked a clear standard of achievement, and many students were not motivated to work hard in school (The Commission on Skills of the American Workforce, 1990).

SCANS Identification of Skill

In June 1991, U. S. Secretary of Labor’s Commission on Achieving Necessary Skills (SCANS) identified the workplace competencies and foundation skills required for effective job performance by identifying and linking skills with requirements for specific workplace competencies. SCANS deemed the skills a requirement of high school graduates or persons entering the workforce, and especially those expecting to
become successful. As such, the report placed particular emphasis not only on identified skills, but on acceptable levels of proficiency, proficiency assessment, and strategies employers and educators must consider in order for students to have access to and meaningful experience with the identified skills.

The Commission recommended using the SCANS reports (The Secretary's Commission on Achieving Necessary Skills, 1991b; The Secretary's Commission on Achieving Necessary Skills, 1991a; The Secretary's Commission on Achieving Necessary Skills, 1992; The Secretary's Commission on Achieving Necessary Skills, 1993; U. S. Department of Labor, 1993a; U. S. Department of Labor, 1993b; U. S. Department of Labor, 1992c; Pelavin Associates, 1992) as tools to identify applicable school-to-work transition skills which could serve as a basis for defining quality instructional products.

**Skill as Defined by SCANS.** The SCANS skills are divided into two categories: Foundation Skills and Competencies. The Foundation skills have three subgroups: (a) Basic Skills, (b) Thinking Skills, and (c) Personal Qualities.

Competencies are divided into five categories: (a) Resources, (b) Interpersonal Skills, (c) Information, (d) Systems, and (e) Technology. Each of these categories is further divided.

To understand the complexity of the nature of this skill set, and the significance the changes these skills impart to VR practice, it is important to view the complete definitions of each of these skills.
Foundation Skills.

1. Basic Skills. (a) Reading—Locates, understands, and interprets written information in prose and documents, including manuals, graphs, and schedules, to perform tasks; learns from text by determining the main idea or essential message; identifies relevant details, facts, and specifications; infers or locates the meaning of unknown or technical vocabulary; and judges the accuracy, appropriateness, style, and plausibility of reports, proposals, or theories of other writers. (b) Writing—Communicates thoughts, ideas, information, and messages in writing; records information completely and accurately; composes and creates documents such as letters, directions, manuals, reports, proposals, graphs, and flow charts with the language, style, organization, and format appropriate to the subject matter, purpose, and audience; includes, where appropriate, supporting documentation, and attends to level of detail; and checks, edits, and revises for correct information, appropriate emphasis, form, grammar, spelling, and punctuation. (c) Arithmetic—Performs basic computations; uses basic numerical concepts such as whole numbers and percentages in practical situations; makes reasonable estimates of arithmetic results without a calculator; and uses tables, graphs, diagrams, and charts to obtain or convey quantitative information. (d) Mathematics—Approaches practical problems by choosing appropriately from a variety of
mathematical techniques; uses quantitative data to construct logical
explanations for real world situations; expresses mathematical ideas and
concepts orally and in writing; and understands the role of chance in the
occurrence and prediction of events. (e) Listening—Receives, attends
to, interprets, and responds to verbal messages and other cues such as
body language in ways that are appropriate to the purpose - for
example, to comprehend, learn critically evaluate, appreciate, or
support the speaker. (f) Speaking—Organizes ideas and communicates
oral messages appropriate to listeners and situations; participates in
conversation, discussion, and group presentations; selects an appropriate
medium for conveying a message; uses verbal language and other cues
such as body language in a way appropriate in style, tone, and level of
complexity to the audience and the occasion; speaks clearly and
communicates a message; understands and responds to listener
feedback; and ask questions when needed.

2. Thinking Skills. (a) Creative Thinking—Generates new ideas by
making nonlinear or unusual connections, changing or reshaping goals,
and imagining new possibilities; and uses imagination freely, combining
ideas or information in new ways, making connections between
seemingly unrelated ideas, and reshaping goals in ways that reveal new
possibilities. (b) Decision Making—Specifies goals and constraints,
generates alternatives, considers risks, and evaluates and chooses best
alternatives. (c) Problem Solving—Recognizes that a problem exists (i.e., that there is a discrepancy between what is and what should be); identifies possible reasons for the discrepancy; devises and implements a plan of action to resolve it; and evaluates and monitors progress, revising the plan as indicated by findings. (d) Mental Visualization—Sees things in the mind’s eye by organizing and processing symbols, pictures, graphs, objects, or other information - for example, sees a building from a blueprint, a system’s operation from schematics, the flow of work activities from narrative descriptions, or the taste of food from reading a recipe. (e) Knowing How to Learn—Recognizes and can use learning techniques to apply and adapt existing and new knowledge and skills in both familiar and changing situations; and is aware of learning tools such as personal learning styles (visual, aural, etc.), formal learning strategies (note taking or clustering items that share some characteristics), and informal learning strategies (awareness of unidentified false assumptions that may lead to faulty conclusions). (f) Reasoning—Discovers a rule or principle underlying the relationship between two or more objects and applies it in solving a problem - for example, uses logic to draw conclusions from available information, extracts rules or principles from a set of objects or a written text, or applies rules and principles to a new situation ( or
determines which conclusions are correct when given a set of facts and conclusions).

3. Personal Qualities. (a) Responsibility—Exerts a high level of effort and perseverance toward goal attainment, works hard to become excellent at doing tasks by setting high standards; pay attention to details; working well even when assigned an unpleasant task; and display a high level of concentration; and displays high standards of attendance, punctuality, enthusiasm, vitality, and optimism in approaching and completing task. (b) Self-esteem—Believes in own self-worth and maintains a positive view of self, demonstrates knowledge of own skills and abilities, is aware of one’s impressions on others, and knows own emotional capacity and needs and how to address them. (c) Sociability—Demonstrates understanding, friendliness, adaptability, empathy, and politeness in new and ongoing group settings; asserts self in familiar and unfamiliar social situations; relates well to others; responds appropriately as the situation requires; and takes an interest in what others say and do. (d) Self-Management—Accurately assesses own knowledge, skills, and abilities; sets well-defined and realistic personal goals; monitors progress toward goal attainment and motivates self through goal achievement; and exhibits self-control and responds to feedback unemotionally and non defensively. (e) Integrity/Honesty—Recognizes when being faced with making a decision or exhibiting
behavior that may break with commonly held personal or societal values; understands the effects of violating these beliefs and codes on an organization, oneself, and others; and chooses an ethical course of action.

**Competencies.**

1. **Resources.** (a) Manages Time—Selects relevant, goal-related activities, ranks them in order of importance, allocates time to activities, and understands, prepares, and follows schedules. (b) Manages Money—Uses or prepares budgets, including making cost and revenue forecasts; keeps detailed records to track budget performance; and makes appropriate adjustments. (c) Manages Material and Facility Resources—Acquires, stores, and distributes materials, supplies, parts, equipment, space, or final products in order to make the best use of them. (d) Manages Human Resources—Assesses knowledge and skills, distributes work accordingly, evaluates performance, and provides feedback.

2. **Interpersonal Skills.** (a) Participates as a member of a team—Works cooperatively with others and contributes to group efforts with ideas, suggestions, and effort. (b) Teaches Others—Helps others learn needed knowledge and skills. (c) Serves Clients/Customers—Works and communicates with clients and customers to satisfy their expectations. (d) Exercises Leadership—Communicates thoughts, feelings, and ideas
to justify a position, encourage, persuade, convince, or otherwise motivate an individual or groups, including responsibly challenging existing procedures, policies, or authority. (e) Negotiates to Arrive at a Decision—Works towards an agreement that may involve exchanging specific resources or resolving divergent interests. (f) Works with Cultural Diversity—Works well with men and women and with people from a variety of ethnic, social, or educational backgrounds.

3. Information Skills. (a) Acquires and Evaluates Information — Identifies a need for data, obtains the data from existing sources or creates them, and evaluates their relevance and accuracy. (b) Organizes and Maintains Information — Organizes, processes, and maintains written or computerized records and other forms of information in a systematic fashion. (c) Interprets and Communicates Information - Selects and analyzes information and communicates the results to others using oral, written, graphic, pictorial, or multimedia. (d) Uses Computers to Process Information - Employs computers to acquire, organize, analyze, and communicate information.

4. Systems. (a) Understands Systems — Knows how social, organizational, and technological systems work and operates effectively within them. (b) Monitors and Corrects Performance — Distinguishes trends, predicts impacts of actions on system operations, diagnoses deviations in the function of a system/organization, and necessary action
to correct performance. (c) Improves and Designs Systems — Makes suggestions to modify existing systems in order to improve the quality of products or services and develops new alternative systems.

5. Technology. (a) Selects Technology — Judges which sets of procedures, tools, or machines, including computers and their programs, will produce the desired results. (b) Applies Technology to Task — Understands the overall intents and the proper procedures for setting up and operating machines, including computers and their programming systems. (c) Maintains and Trouble Shoots Technology — Prevents, identifies, or solves problems in machines, computers, and other technologies. (The Secretary's Commission on Achieving Necessary Skills, 1991; U. S. Department of Labor, 1992c; U. S. Department of Labor, 1993b)

The SCANS skills are unique skill set. They are both educationally and vocationally related. They focus on the education of the whole person. They include academic skills, as well as, applied knowledge. The SCANS Skills also offer a skill set that is more comprehensive and precise, than the skill set found in the DOT.

The SCANS Report (The Secretary's Commission on Achieving Necessary Skills, 1991b) is currently used as a resource to measure and design skill-related content. In practice, many curriculum developers include SCANS skills and competencies within their instructional materials and curricula (U. S. Department of Labor, 1993b).
The SCANS Skills and Competencies present a relatively complete framework in which educators can cross-reference their curriculum's skills and competencies to the skills and competencies demanded by SCANS and theoretically, by the workplace. When integrated with a regular curriculum evaluation process, the SCANS skills provide a sound foundation for developing, adapting, or revising curriculum for successful programs (The Secretary's Commission on Achieving Necessary Skills, 1991b; The Secretary's Commission on Achieving Necessary Skills, 1992).

The SCANS Skills have been adopted widely throughout the U. S. in secondary education. Workplace literacy programs have allowed employers to participate in the program development (The Secretary's Commission on Achieving Necessary Skills, 1993). Testing, curriculum development, school-to-work and vocational education have kept pace with the SCANS initiative (The Secretary's Commission on Achieving Necessary Skills, 1992). New teaching initiatives (e.g., The New Standards Project), classroom syllabi (e.g., Pacesetter), electronic information systems (e.g., WORLDLINK), SCANS-based test batteries (e.g., Work Keys), external diploma programs (e.g., state programs replacing the present GED program), and state and local initiatives (U. S. Department of Labor, 1992a) aimed at adopting the SCANS skills in the school-to-work transition programs all have appeared since the initial SCANS report.

The SCANS Skills have a wide-ranging impact. They are incorporated into the O*NET as part of the Generalized Work Activities, and thus are a part of the new occupational skill set. However, their most dramatic impact has been seen in the
creation of the National Skill Standards Board, in post-secondary work-place literacy programs, and in school-to-work programs. The SCANS skills and the programs in which they are adopted have effected the knowledge base on which skill is defined in the labor market, and on the way knowledge is organized, developed, and presented.

The National Skills Standards Board

The National Skills Standards Board (NSSB) is a national organization that advocates for the creation and adoption of a national system of skill standards aimed at improving workforce effectiveness in the world economy (National Skill Standards Board, 1999). The Board was created by Congress via the National Skills Standards Act of 1994 that tasked this organization with creating a voluntary system of national skill standards.

Skill standards by this structure are performance specifications as identified by the knowledge, skills, and abilities a person needs to be successful in the workplace. The Board asserts that the workplace is constantly changing. Jobs require high performance processes and improved skills. Skill standards reflect the capabilities of the new reality. Further, the Board indicates that the "shelf-life" of skills is shrinking and benchmark standards are need for corporate trainer to make better training and education investments.

The NSSB process is a voluntary public-private partnership. The Board facilitates by providing seed money for the creation of a partnership of stakeholders (e.g., employers, employees, and educators) to develop standards. Once formed, this partnership then is recognized by the NSSB as a Voluntary Partnership as defined in
the enabling legislation. The partnership sets out to define the skill standards for the
industry they represent. Once finished, if the standards meet NSSB criteria, the
standards are endorsed by the NSSB, and recognized throughout the country as those
skills associated with the jobs in the given industry.

Three partnerships are currently recognized by the NSSB. They are
Manufacturing Skill Standards Council (MSSC), Sales and Service Voluntary
Partnership (SSVP), and Education and Training Voluntary Partnership. It is expected
that MSSC or SSVP will release skill standards by the end of 2000. These two
partnerships and the industries that comprise them cover 40% of the nation's
workforce. Other partnerships are in the process of convening. They include
Communication, Entertainment and Information; Finance and Insurance; Construction,
and Restaurant, Hotel, and Hospitality.

The NSSB has set criteria for the go-going update and revision of the
standards. The focus is to keep employers and employees "one step ahead of the
rest" (National Skill Standards Board, 1999). This is a certification function of the
Board and is akin to the professional education standards and continuing education
requirements all professionals achieve. NSSB's focus is on the rest of the workers
who are not covered by a similar educational process.

This skill structure, though embryonic, shows the importance of skills to the
workplace. Certification will have far ranging impact on the way in which workers
are recruited and retained on the job. Further, given the presence and impact of the
SCANS skills and the NSSB, seemingly the workplace has changed the basic concept of workplace literacy.

**Workplace Literacy**

The bottom line for the concern about illiteracy, whether a deficit in basic skills or a lack of judgment, is economic. Millions of employees suffering from varying degrees of illiteracy are costing their companies daily, through lower productivity, workplace accidents and absenteeism, poor product quality, and increased management and supervisory time. American employers have traditionally viewed competency in workplace basics as solely the responsibility of the individual. In today's economy, however, employers are beginning to realize that they must assist their current and future workers to achieve competency in workplace basics if they are to be competitive (Carnevale, 1991; Hays, 1999b).

The definition of literacy that sufficed for an earlier age and a different economy has been replaced by a host of higher-order literacy's that call for workers to analyze, think critically, evaluate, synthesize information, communicate more effectively, solve problems, learn how to learn and relearn, and, in general, learn far more actively than traditionally (The Commission on Skills of the American Workforce, 1990). The most pervasive and unquestioned belief about literacy in relation to work is that workers do not possess the important literacy skills needed in current and future jobs. The Department of Education estimates there are 27 million adult Americans who can't read. Almost all can sign their names or spell out a headline, but are functionally illiterate. They may not be able to read the label on a
medicine bottle, fill out a job application, write a report, or read the instructions on operation of a piece of equipment (Carnevale, 1991; Hays, 1999a).

Further, qualifications for today’s middle and low-wage jobs are rising even more rapidly than in the past. In 1965, a car mechanic needed to understand 5,000 pages of service manuals to fix any automobile on the road. Today, mechanics must be able to decipher 465,000 pages of technical text, the equivalent of 250 big-city telephone books (Hull, 1999).

Workplace literacy training must meet not only company needs, but also the other needs of employees, or they may not participate. According to the National Alliance of Business (NAB), there are a number of key points to consider when developing a workplace literacy-training program. The most effective workplace literacy (WL) programs share several characteristics, including: (a) Training objectives that are tied to company business objectives, and reflect company, employee and customer needs. (b) WL training curricula, structure and delivery methods that reflect the workplace and its requirements. (c) WL training that is tailored to trainee needs. (d) Program Assessment that is customized to workplace requirements. (e) The WL program is flexible and encourages and facilitates employee participation. (f) The staff involved in development and delivery of programs are highly skilled and well trained. (g) Evaluation that assures training quality (Hays, 1999b).

Because of the use of the SCANS skills in the curriculum in WL programs, the educational efforts integrate well with O*NET data (Philipi, Norback, Mikulecky & Sticht, 1996; Philipi, Norback, Mikulecky & Sticht, 1997; Philipi, 1997; Carnevale,
Curricula have been developed for WL programs, and on-site efforts are taking place (Hull, 1999).

**School-to-Work Initiatives**

The SCANS Skills have also had impact on education. School-to-Work programs have been created as a result of the School-to-Work Opportunities Act of 1994 (National School-to-Work Learning & Information Center, 1999) which have targeted transition programs for labor market access. These programs must have three core elements: (a) School-based Learning—classroom teaching which contains business-defined occupational skill standards and high academic skills. (b) Work-based Learning—careers exploration, work experience, and structured learning at job sites. (c) Connecting activities—course integration, matching of students with employers, and training of mentors.

Conceptually, school-to-work programs were to integrate academic and vocational education, link secondary and post secondary education, and fully involve the private sector. The reality is that most local programs have spent time overcoming the negative image of vocational education (National Center for Research in Vocational Education, 1999). The local programs shifted emphasis to the concept that school-to-work benefits all students including the college-bound. A major contributor in this area is the National Center for Research in Vocational Education (NCRVE; National Center for Research in Vocational Education, 1998).

NCRVE is the nation’s largest center for research, development, dissemination, and outreach in work-related education. It is funded by the Office of Vocational and
Adult Education of the U. S. Department of Education. Headquartered at the University of California, Berkeley since 1988, NCRVE is presently an eight-member consortium, with Berkeley assisted in its efforts by the University of Illinois; MPR Associates; University of Minnesota; RAND; Teachers College, Columbia University; University of Wisconsin; and Virginia Polytechnic Institute and State University. The presence of NCRVE or its members in every area of the country permits contact with a range of schools, institutions and labor markets in the United States. It also connects NCRVE with practitioners in each geographic region of the country.

NCRVE plays a key role in developing and disseminating a new concept of vocational education as it works towards fulfilling its mission. NCRVE believes such education: (a) offers every student the option of a high-quality, career-related course of study; (b) integrates curricula, maintaining an emphasis on learning through applied problem solving—a strong feature of traditional vocational education—while including a rigorous course of academic study; (c) simultaneously prepares students for immediate employment, further education, and lifelong learning (National Center for Research in Vocational Education, 1998).

Finding innovative ways to connect education and work is central to NCRVE’s mission. NCRVE is committed to offering all students opportunities for challenging, relevant academics and meaningful work-based learning experiences in their communities. Through research and direct assistance to schools, NCRVE promotes education that prepares students for college, careers, and lifelong learning.
As skill and the demands for skillful workers has increased in the ever expanding and technologically more sophisticated labor market, skill definition, occupational classification and workplace education have evolved as well. Additionally, in the rehabilitation process, the identification of skill, and the understanding of when it transfers is important. RCs are often in a diagnostic position in service-delivery planning and disability determination (Klein, Wheaton, & Wilson, 1997). Thus, the assessment of the demands of work, the evaluation of the skills possessed by the client, and the knowledge of jobs to which these innate abilities may transfer are a necessary part of the function of the RC (Wright, 1980; Social Security Administration, 1992).

Work Assessment and Transferable Skill Analysis

VR has traditionally examined the whole person (Wright, 1980). In order for plan development to occur a goal needed to be established and a person's assets and limitations assessed. Services then focused on restoring or providing abilities to overcome the limitations, for persons with disabilities to achieve success (Wright, 1980). Identification of a person's already existing skills and the ways they could be utilized in direct placement become useful in plan development. Thus Transferable Skill Analysis (TSA) is important.

The proper method for doing TSA has been debated in the rehabilitation literature (Watters, 1984). One method commonly used is that one established in the 1970s by the Social Security Administration for use by vocational experts at disability determination hearings. Williams (1998) argues that even with a codified definition
that there is no agreement regarding the steps to execute the analysis. Another common method is based on the GOE structure and is advocated by Saxon and others (Saxon & Deutsch, 1976; Saxon & Roberts, 1983; Saxon & Spitznagel, 1995). However, the VDARE process (McCroskey, Wattenberger, Field & Sink, 1977) has long been considered a standard in TSA.

**The Social Security Definition of TSA**

The use of occupational information in the award of disability is well established. In the Social Security Administration (SSA) disability award system, medical and vocational factors are instrumental in the award of disability (Social Security Administration, 1992). Fundamental to the use of vocational information is the understanding of when and how skills transfer (Office of Hearings and Appeals, 1990). The analysis of transferable work skills is basic to the establishment of disability. Such analysis is linked to the determination of an individual's ability to reenter the labor market in the same or a similar occupation, at skilled or semi skilled levels (Office of Hearings and Appeals, 1990).

The way in which skill transfers is codified in Social Security administrative regulations and is the basis for vocational expert testimony during the appeals process. The definition reads:

Transferability is most probable and meaningful among jobs in which—

a. the same or lessor degree of skill is required;

b. the same or similar tools and machines are used; and
c. the same or similar raw materials, products, processes, or services are used (20 CFR 401.100 404.1568 (d)(2)).

The Code of Federal Regulations goes on to define degrees of transferability. These degrees are useful in understanding the TSA process.

Degrees of transferability. There are degrees of transferability of skills ranging from very close similarities to remote and incidental similarities among jobs. A complete similarity of all three factors is not necessary for transferability. However, when skills are so specialized or have been acquired in such an isolated vocational setting (like many jobs in mining, agriculture, or fishing) that they are not readily usable in other industries, jobs and work settings, we consider them non-transferable (Code of Federal Regulations Volume 20 404.1568(d)(3)).

Implicit in this definition is the utilization of the following DOT coding structures: Specific Vocational Preparation (SVP); Work Field/Machines, Tools, Equipment and Work Aides (WF/MTEWA); and Materials, Products, Subject Matter, and Services (MPSMS). The definition uses those DOT codes that identify the Work Performed Components of occupational information. The importance of the application of worker traits to work process is to separate those workers whose abilities when applied to work process make them more likely to reenter the labor market. Or the converse, those without ease of labor market access based on applied abilities to work process are more likely to have vocational impairment. These
concepts are the basis for the medical-vocational grid that is utilized in the disability determination process.

The GOE Method of TSA

Traditionally, by utilizing the Guide for Occupational Exploration (GOE), the DOT, and the Selected Characteristics of Occupations Defined in the Dictionary of Occupational Titles (SCO), the RC has been able to construct a transferable skills and abilities profile (Bose, 1991).

While obtaining an in-depth work history, the RC elicits information about previous jobs, most importantly: job title, description of work performed (including processes, materials, and materials), length of employment, and factors most and least liked by the client. Hobbies, recreational activities, volunteer positions, and activities of daily living are also considered, and are particularly useful when vocational limitations are present or when the client has a limited work history.

Once this information has been obtained, the job title definitions are researched and reviewed by locating each in the DOT. Once the appropriate occupational title and code for each job is located, the actual definition can be reviewed and compared to the information provided by the client. The next step is to locate the job title in the GOE. For each job title in the work history, the RC locates an industry designation, a nine-digit DOT occupational code, and a six-digit GOE code. These codes are used to locate other jobs in the GOE which are related to the jobs in the person's work history.
Using the SCO, information is collected for each new job. Data are examined under the following categories: physical demands, environmental conditions, mathematical and language developments and specific vocational preparation.

Once the aforementioned steps have been completed for each of the client's jobs, the disability factors are considered. Skills and abilities eliminated by the disability are noted. The remaining information reflects the clients' existing skills and abilities. This constitutes the transferable skills and abilities profile (Saxon & Deutsch, 1976; Saxon & Roberts, 1983; Saxon & Spitznagel, 1995).

The VDARE Method of TSA

Vocational Diagnosis and Assessment of Residual Employability (McCroskey, Wattenberger, Field & Sink, 1977) introduces a method, known as VDARE, which also establishes a worker profile as the basis for matching to occupational titles. VDARE is a seven-step process. Step one is data gathering. This step brings together all available medical, psychological, social, educational, and vocational information regarding the person being evaluated. Step two is recording specific DOT data about the client's work history. Step three is creating the prevocational profile. This is a profile that represents the client's demonstrated work performance prior to applying any other known cases data. Step four is generating the Residual Functional Capacity (RFC). This step calls for the prevocational profile to be adjusted to reflect changes (increased or decreased) as a result documentation of the client's assets, limitations or objective assessment by testing. Step five is evaluation and planning. At this step, determinations are made regarding the need for further evaluation or assessment of
specific capacities that may remain in question. Step six is generating vocational outcomes. The RC compares the RFC with the DOT to determine potential outcomes. This comparison is done in the following sequence: first to the jobs in the client’s work history, second to related jobs as determined by the OGA of the work history. Within the VDARE method, the OGA is the grouping of choice to insure accurate transferability. Step seven is checking the local labor market and reporting the results (Havranek, 1997).

The importance of TSA as a concept to disability determination and the Social Security system has influenced its utilization elsewhere. It is found in other insurance-based systems (i.e., workers’ compensation) and in a variety of forensic proceedings (i.e., personal injury, medical malpractice, and divorce/custody; Kontosh, 1995). However, the process though codified and standardized in Social Security Disability is not standard in other disability systems, nor is it specified in legal proceedings.

Forensic rehabilitation professionals who practice outside of the Social Security system do not have a universally acknowledged standard by which to analyze work skill transfer to other occupations (Truthan, 1989; Saxon & Spitznagel, 1995). The lack of a universal process is evident by the variety of coding options and levels of specificity of transfer that one is able to select when using skills transfer software (Botterbusch, 1986).

Forensic Rehabilitation

Forensic rehabilitation is a major area of practice for rehabilitation professionals. Whether it is disability determination, workers' compensation, civil
tort, long-term disability, or other support program, persons with disabilities are frequently involved with the legal community. Thus, litigation is a significant force shaping public policy for persons with disabilities (Deutsch, 1990).

In 1960, the SSA began its use of vocational information in the disability adjudication process (Bose, 1991). Thus, also began use of RCs as expert witnesses. Since then, the use of rehabilitation professionals as vocational experts has expanded into a variety of forensics arenas (Brandon, 1983; May, 1983; Weikel, 1986; Havranek, 1997). In this role RCs present testimony about the effects on labor market access of an individual's present functional capacity, mental and physical. Common in this effort are the activities of analyzing vocational potential; providing life-care plans; and estimating lifetime earning capacity loss.

Several recent events have significantly affected forensic rehabilitation, and the ways in which RCs practice. The Americans with Disabilities Act has extended to the private sector employers those nondiscriminatory practices previously enacted and applied only to public employers. Additionally, the U. S. Supreme Court has issued rulings (the Daubert, Kinnaman, and Kumho decisions) which have set new standards for the quality of expert testimony and the base on which it relies.

The Americans With Disabilities Act

Persons with disabilities often experience problems in their attempts to gain and maintain employment. For example, a recent U. S. Census Bureau report indicates that only 34.6% of working age persons with disabilities are employed, compared to 79.8% of those without disabilities (U. S. Bureau of the Census, 1993).
Individuals with disabilities have been primarily employed in part-time, low-status jobs that offer little chance for advancement (Braddock, 1994). Furthermore, the income level of working people with disabilities is often up to 35% less than their non-disabled counterparts. These employment problems suggest that many disabled individuals do not have the opportunity to experience a satisfying career or achieve their full potential in organizational settings. Moreover, it has become increasingly evident that employers have not fully utilized the valuable talents and skills that people with disabilities bring to the workforce (Braddock, 1994; Stone, 1996).

In an effort to remedy this situation, the Americans' with Disabilities Act (ADA), modeled after the Rehabilitation Act of 1973, extends the provisions against discrimination to private employers, whether or not they receive federal financial assistance. The ADA also is more explicit and detailed including people with disabilities in their workforce and what is meant by reasonable accommodations. To assure compliance, employers should: (a) carefully review the Equal Employment Opportunity Commission's guidance; (b) thoroughly train interviewers and others involved in the selection process; and (c) audit to ensure that only lawful inquiries are made of applicants and employees, including review of existing forms and policies, to ensure compliance with the ADA (Barlow, 1994; Blanck, 1998; Esposito, 1992).

The ADA prohibits questions about the existence, nature, or severity of a disability and medical examinations before a conditional job offer has been made. The ADA requires that individuals must fulfill the job's essential tasks, with or without accommodation, without being a substantial threat to themselves or others. A
qualified individual with a disability is identified under the ADA as an individual with a disability who with or without accommodation can perform the essential functions of an employment position that the individual holds or desires. The presence of a disability is not a permissible ground for assuming a person is unable to function effectively in a particular job. Persons with disabilities who meet all the employment criteria and who can perform the essential functions of the job, with or without reasonable accommodations, cannot be rejected from a job simply because of a disability.

Whether a person with a disability is qualified to perform a particular job is to be determined at the time of the employment decision. This determination should be based on the capabilities of the individual with a disability at the time of the employment decision, and it should not be based on speculation that the employee may become unable in the future or may cause increased health insurance premiums or worker’s compensation costs.

The essential functions of a particular job may be determined by using the job description formulated by the employer or relying on those familiar with the particular job. Not all job functions articulated by an employer are essential functions nor are all employer qualifications to be accepted as essential.

Although legitimate physical qualifications may be essential to the performance of certain jobs, that determination and the determination of whether accommodation is possible to overcome any physical limitations must be made by scrutinizing the
evidence. An employer's justification for excluding a person based upon a disability must be grounded in a careful, open-minded weighing of the risks and alternatives.

If a person with a disability is unable to meet the employer's requirements, it is the employer's obligation to investigate and determine whether a reasonable accommodation can be made to enable the person to perform the job. A person with a hearing loss might be accommodated by being required to wear a hearing aid on the job at all times. Some accommodations could include polycarbonate lenses, contact lenses, and eyeglass straps. If reasonable accommodations do exist, these must be used rather than excluding the person with a disability. Otherwise, the employer is required to demonstrate factually that making reasonable accommodations would either require a modification of the essential nature of the job or impose an undue burden upon the employer.

An employer may require, as a qualification standard, that an individual not pose a direct threat to the health or safety of himself/herself or others. The determination that an individual with a disability poses a direct threat should be made on a case-by-case basis. The determination may also be based on a reasonable medical judgment that relies on the most current medical knowledge, the best available objective evidence, or both. In determining whether an individual would pose a direct threat, the factors to be considered include: (a) the duration of the risk, (b) the nature and severity of the potential harm, and (c) the likelihood the potential harm will occur.
If an individual poses a direct threat as a result of a disability, the employer must determine whether a reasonable accommodation would either eliminate the risk or reduce it to an acceptable level. An employer is not permitted to deny employment to an individual with a disability merely because of a slightly increased risk. The risk can be considered only when it poses a significant risk, that is, a risk that has a high probability of substantial harm. A speculative or remote risk is insufficient to exclude someone from employment.

RC's practicing in forensic areas are often consulted to analyze and testify to essential job functions, methods of accommodation and whether they are feasible, potentiality to pose a threat to others or self, and labor market access issues and concerns. The RC is well trained by education and experience to assess the vocational issues raise by litigation initiated under this law.

**Expert Testimony**

In 1993, the U. S. Supreme Court issued an opinion regarding admissibility of scientific evidence *(Daubert v. Merrell Dow Pharmaceuticals, Inc., 1993)*. This opinion established a standard for expert testimony. Prior to the decision the standard in federal courts was known as the Frye standard, and it allowed expert testimony under a standard of "general acceptance." If the methods used by the expert were general accepted in the scientific community, then the testimony was admissible.

The new standard is based on four factors. First, whether a theory or technique can be and has been tested. Second, whether it has been subjected to peer review and publication. Third, whether there is a high rate of error in controlling the
technique's operation. Fourth, whether the theory or technique enjoys acceptance within the scientific community (Miller, 1999; Savage, 1999).

In a more recent ruling on Kumho Tire Co. Ltd. v. Carmichael, No. 97-1709 (March 23, 1999), the Supreme Court completed a six year process of transforming Rule 702 of the Federal Rules of Evidence into a powerful judicial safeguard against jury verdicts premised on unreliable expert testimony. In this opinion, the Supreme Court told trial judges they must block experts from offering their opinions in court unless their testimony meets a rigorous standard of reliability (Savage, 1999). As a result of this case, federal trial judges (a) are obliged to determine if any challenged expert testimony is unreliable (and hence to be excluded), whether or not it purports to be scientific; (b) have the discretion to fashion appropriate criteria for making that determination; and (c) have the choice of criteria. Decisions to exclude will be reviewed only on an abuse-of-discretion basis. The trial judge has discretion to choose among reasonable means of excluding expertise that is false and science that is junk but not discretion to abandon the gatekeeping function nor to perform the function inadequately (Miller, 1999). An expert may have the credentials and experience that would give weight to his or her opinions, but that alone will not be enough. The judge must also scrutinize the proposed testimony to insure that the conclusions are based on scientific principles or a generally accepted test of reliability.

This ruling pertains to all manner of expert testimony from psychologists to handwriting analysts. Although it applies to federal courts, many state courts are influenced by rules set in federal courts. The roots of this ruling lie in Daubert v.
Merrill Dow Pharmaceuticals, Inc. where the Supreme Court first read Rule 702 to permit trial courts to exclude expert testimony based on flawed methodology or assumptions.

The Kumho ruling extends reliability analysis and abuse-of-discretion review to all expert testimony by permitting such testimony to be excluded whenever its "factual basis, data, principles, methods or their application are called sufficiently into question" (Miller, 1999, p. B5). Thus, trial courts should conduct Rule 104 admissibility hearings whenever any significant challenge is raised to expert testimony. Furthermore, they should exclude questionable testimony when their own judgment tells them it is unreliable (Savage, 1999; Miller, 1999).

The Kumho decision reinterprets Rule 702 of the Federal Rules of Evidence, which the Daubert decision described as having a liberal thrust in favor of letting juries hear all the evidence. The Supreme Court's development of Rule 702 has significantly reallocated power between court and jury. Some see this as a change from a liberal, open-ended rule of evidence to a conservative barrier allowing judges, not juries, to make key decisions. Others argue that since judges can analyze the reliability of expert resources and judicial conference-supplied instructional material, all of which are unavailable to the jury, trial courts are better able to evaluate such testimony (Miller, 1999; Savage, 1999).

Recently the U. S. District Court for the Eastern District of Missouri has disqualified the testimony of a vocational rehabilitation expert in an action brought under the ADA. In Kinnaman v. Ford Motor Co. (No. 4: 98CV269 [E. D. Mo. Jan
the judge ruled that the vocational expert's reliance on Internet-generated data and its inclusion into the expert's report to be a "bald assurance of validity" that failed all four of the recognized Daubert criteria for reliability of expert evidence. Thus, the standards of Daubert and the need for a scientific basis for testimony has been specifically established for forensic rehabilitation testimony.

The concept of skill transferability and the basis on which decisions are reached concerning when and if skills are transferable is basic to rehabilitation practice in disability determination, civil rights, employment access, and other forensic areas. This concept's scientific basis and the process by which the forensic opinion is reached is significant not only to quality testimony, but to the rights of persons with disabilities, thus it is equally important to service delivery and the rehabilitation process. The Daubert and Kumho decisions significantly effect forensic rehabilitation professionals, their methods, and their practice.

The efficacy of the RCs who do TSA is challenged by the fast-paced changes which are occurring in the labor market, the educational system, and the court system. Perception of professional competence is fundamental to good practice. Thus, practitioner's perceptions of their skill of practice are worthy of investigation.

Self-Efficacy

For over twenty years Albert Bandura (1977; 1982) has argued that self-efficacy expectations, beliefs about one's ability to perform a particular behavior, are the primary influence on behavior and behavior change. Based on efficacy expectations, an individual decides whether or not to attempt a behavior, for how
long, and with how much effort. Those who have low self-efficacy expectations may not attempt a behavior even if they perceive such performance may produce desired outcomes. Rather, such people dwell on their deficiencies, view challenging situations as threats, and experience high levels of anxiety. Those who have high self-efficacy expectations, however, experience less anxiety, explore options more freely, and change behaviors more successfully.

Sources of self-efficacy are varied and complex. Bandura identifies four broad categories of experience that are central in the development of self-efficacy: inactive mastery (i.e., personal attainment), vicarious experience (i.e., modeling), verbal persuasion (i.e., feedback and encouragement), and physiological and affective states (i.e., anxiety and excitement). Although the evidence is clear that these four kinds of experiences influence efficacy perceptions, the process is by no means simple. In fact, it is a rather elaborate cognitive process in which the individual appraises, integrates, and orchestrates these experiences in a way that produces self-efficacy. Simply telling yourself that you are capable is not enough, especially when it contradicts your preexisting beliefs and past experience. Improving one's self-efficacy is a complex matter of self-persuasion that entails "the product of cognitive processing of diverse sources of efficacy information that is conveyed inactively, vicariously, socially, and physiologically" (Bandura, 1977, p. 115).

The interactive relationship between self-efficacy expectations and action poses a number of implications. Such expectations influence which career behaviors are attempted and which are avoided (Lent, 1987). For example, the level of one's
expectations influence the career one may chooses, the degree and manner of skill execution, and potentially the manner in which a rehabilitation professional prepares and presents expert testimony.

Bandura's model filters resulting behavior through one's developing perception of self-efficacy. This perception influences three specific behavioral domains: (a) choice versus avoidance behaviors result in the decisions an individual makes to do or commit to certain activities or career choice (e.g., forensic rehabilitation); (b) performance behaviors relate to the quality of the execution of the choice that is made (e.g., high quality TSA); (c) persistence behaviors are an indication of the length of time one in an activity (e.g., length of time in forensic practice).

Initially, career self-efficacy (Betz & Hackett, 1981) was an attempt to explain two problems related to women's career development. The first is avoidance behavior or women's under representation in male-dominant careers (e.g., engineering and mathematics). The second is persistence behavior or any under utilization of women's talents in career activities. The Betz and Hackett study measured perceived self-efficacy in education requirements and job duties for ten "traditional" occupations (Betz & Hackett, 1986). The study concluded that self-efficacy was an important consideration in career choice. Since then, career efficacy has been applied to both women and men (William & Betz, 1994), and supported by extensive research (Lent, Brown & Larkin, 1986; Lent, Brown & Larkin, 1987; Nevill & Schlecker, 1988; Post-Krammer & Smith, 1985; Taylor & Betz, 1983; Taylor & Popma, 1990;
Williams, 1993). Career self-efficacy (Betz & Hackett, 1981; Betz, 1992) is also reflected in the three domains of behavior.

The on-going development of career self-efficacy theory has included the application of career decision-making (Taylor & Popma, 1990; Osipow, 1999). With the increasing need for individuals to face multiple life and career transitions has come the need to intervene in career decision problems. Osipow (Osipow, 1999) identifies two concepts related to the inability to make career decisions. One is career indecision. This concept is viewed as developmental and is a phase that most persons will pass through as they reach a decision. The second is indecisiveness. This concept is not a part of ordinary human development. It is rather a personal trait that spans most situations where decisions need to be made, and indecision results as a customary pattern of the individual's condition.

Application of this theory to the career choices of rehabilitation professionals is accomplished by a study of sources of efficacy information (Betz, 1992). Betz argues that interests, as expressed by vocational choice of career, as well as, tasks within career, and perceived self efficacy will determine if one's quality of execution of task is high or low.

For the purposes of this study, the domain of interest is performance behaviors and their relationships to TSA method and application to case work. Efficacious practice for professionals is fundamental and necessary. Counseling, testimony, and expert opinions are a integral part of forensic rehabilitation. As the rights of persons
with disabilities are further defined through litigation, RCs' testimony will be increasingly relied on.

Definitions

The following definitions are offered for clarification.

1. SSA definition of transferable skill:

Transferability is most probable and meaningful among jobs in which—

a. the same or lessor degree of skill is required;

b. the same or similar tools and machines are used; and

c. the same or similar raw materials, products, processes, or services are used (20 CFR 401.100 404.1568 (d)(2)).

2. Transferable Skill Analysis: A systematic assessment process aimed at an objective evaluation of a person's ability to apply work skills used in and reinforced by one occupation to the successful performance of another occupation.

3. Forensic rehabilitation: A non case management type of practice where the focus of the applied skills of the rehabilitation professional is in the assessment of an individual's earning capacity, labor market access or life care needs, and the resultant assessment is to be utilized in a court proceedings or other legal matters.

4. Self-Efficacy: Beliefs about one's ability to perform a particular behavior, which are the primary influence on behavior and behavior change.
5. Career: The activities and positions involved in a vocation and associated with an person's lifetime work.

Summary and Conclusion

This chapter has presented a review of the literature arranged in four major areas: (a) literature related to the theory of career selection and OC; (b) literature related to work skill structure and identification; (c) literature related to work skill assessment and TSA as it is applied in disability determination and forensic rehabilitation; and (d) literature related to self-efficacy.

From this review the following conclusions are drawn:

1. Career theory supports the identification and inclusion of work skill in Occupational Classification.

2. Identification and development of skill is important to vocational rehabilitation, work force development and literacy, vocational education, and business in an international, interdependent labor market.

3. Skill identification and skill transfer assessment is fundamental to disability determination and forensic rehabilitation testimony.

4. Efficacious ability in the assessment of skill and in the understanding of how and when skill transfers is essential to professional rehabilitation process.

Therefore, given the importance of work skill identification, and the demand for efficacious practice and analysis of skill and its transfer, a survey is justified to
establish the methodological processes and utilization patterns of TSA currently in use in the forensic rehabilitation community, as well as, the level of self-efficaciousness among RCs. Base-line data will be obtained which will provide the opportunity for further investigation and the establishment of empirically-based protocols for the TSA process.
CHAPTER 3

METHODOLOGY

This chapter describes the scope and methodology of the study. It is composed of nine sections. Section one presents the research questions this study will address. Section two will discuss the purpose of the study. Sections three and four describe the setting of the study and the participants respectively. Sections five and six cover the research design and the study's variables. Sections seven and eight concern data collection and analysis. Finally, expected results are discussed in section nine.

Research Questions

The following are the research questions that were investigated in this study:

Question 1—Are there multivariate relationships which can be identified between the software used to do TSA analysis and the method used to do the analysis?

Question 2—Are there relationships that can be identified between the case types on which TSA is used and the method selected?

Question 3—Are there relationships between software program which is used to do TSA and the case types to which it is applied?
Question 4—Are there relationships between perceived self-efficacy in executing TSA, and whether software is used in the TSA process, which software program is selected, the methods used, and case types to which TSA is applied?

The predictor variables were hypothesized based on heuristic expectations. Statistical correlations between each practice and practitioner variable were computed to determine which of the descriptive and predictor practice variables had the greatest correlation with the criterion variables. These predictor variables were then used in the model for the study.

Purpose

The purpose of this study was to differentiate TSA method and utilization pattern by forensic case type. Demographics were used to examine the difference among the study's participants. Data regarding casework experience (i.e., numbers of various types of cases) and number of cases in selected practice activities (i.e., case management) were used to identify the individual's forensic practice focus. Type of software used determined TSA methodology and patterns of utilization. This knowledge is useful in formulating questions regarding empirically based protocols and establishing TSA best practice usage in the disability determination process.

Participants

The participants in this study were a randomly selected sample of 75 members of the Forensic Section of IARP (IARP/FS). This group is the only national professional organization that actively represents the rehabilitation forensic community. Historically, IARP has had a supportive attitude regarding research in
general, as well as, supporting research into those critical areas that forensic practitioners use as a basis for testimony. Those professionals are advanced practitioners with advanced degrees, extensive experience, and consummate skill. IARP members are predominantly located in the United States, although some may reside in Canada and Puerto Rico. However, this study is fundamentally concerned with U. S. law and its impact in persons covered by that law; therefore, Canadian residents were culled from the sampling frame. Additionally, persons participating in the pilot test of the instrument designed for this study, The Ohio State University (OSU) faculty, and this researcher were culled.

Eligibility for membership in IARP/FS is initiated by the individual desiring membership. However, the advanced and technical nature of the group attracts only persons who actively practice in the forensic area. As of May 17, 1999 the section’s membership totaled 301 (International Association of Rehabilitation Professionals 1999). Though this number does not represent all of the practicing forensic professionals who use TSA, IARP/FS is among the largest groups of these professionals. By using this organization in the study, most of the targeted professionals were available to the survey.

The data for this study was collected by a telephone survey of selected members of IARP. One hundred and thirty three persons were drawn in total from the frame. Post cards were sent to all selected allowing each to decline participation. Seventeen "no" responses were received. Additionally, 11 persons declined when
phone contact was made. When 75 completed surveys were obtained, calling ceased. Thirty persons remained uncalled.

Overview of Research Design

This study surveyed the existing methodological processes, utilization patterns, and perceived levels of self-efficacy in executing transferable skill analysis (TSA). A “one-shot” study design was used. Although Campbell and Stanley (1966) list the “one-shot” case study as pre-experimental, Campbell (Campbell, 1975) subsequently defends its usage in studies where explanation through pattern matching is desired. Its use in this study is appropriate because existing patterns of TSA execution are the focus of the research. Present TSA utilization patterns will help establish a baseline for further research.

All demographic data was used to describe the respondents. Relevant demographic data was used to investigate other correlations to the criterion variables that may exist but are not foreseen.

The criterion variables (if software is used, which program is used, and which methodologies are used) and descriptor variables will be measured by a questionnaire devised by this researcher (Appendix A).
Explanation of Variables

The variables for this study are:

Descriptor Variables

1. The state in which the rehabilitation professional does most of his or her practice. This variable is nominal and will reflect one of the fifty states or "other" locations to be entered that are not included in the state categories (e.g., Puerto Rico).

2. Number of years in the rehabilitation field. This variable is interval and is the number of years reported by the person completing the questionnaire.

3. Number of years doing forensics. This variable is interval and will reflect the number of years gathered through self report.

4. Highest education level. This is an ordinal variable with six categories: High School diploma, Associates degree, Bachelors, Masters, Ph.D., and other.

5. Major of highest degree. This is a nominal variable. It will have four categories: Rehabilitation, Economics, Psychology, and other.

6. Professional certifications. This is a nominal variable and the categories are not mutually exclusive. This variable will have as many categories as identified by the person completing the questionnaire up to seven categories: CRC, CDMS, CCM, ABVE/Diplomate, ABVE/Fellow, CEA, and other.

7. Professional memberships is nominal and also not mutually exclusive. It will have as many as 4 categories: NRCA, ARCA, AREA, Other.

8. Use of TSA is nominal and dichotomous (i.e., yes or no). It reflects if TSA is used by the rehabilitation professionals.
9. Number of cases done in 1998 in selected professional activities. This is a set of up to nine-level ratio variables. Levels are rehabilitation case management, counseling, vocational testing, Social Security, workers' compensation, personal injury, divorce/custody, medical malpractice, and other. Measurement will reflect the number of cases worked in each category by the person completing the questionnaire.

10. Number of cases where TSA is used in selected activities. This is a nine-level interval variable. The levels are rehabilitation case management, counseling, vocational testing, Social Security, workers' compensation, personal injury, divorce/custody, medical malpractice, and other. This variable will be used to generate the percentage of time TSA is used on each case type.

11. TSA self-efficacy. This is an interval, scaled variable. It results from a self-efficacy scale in the questionnaire designed for this study (Appendix A).

Criterion Variables

12. Patterns of TSA. This is a six by four table of ratio data. It consists of the number of times a given TSA method was used in conjunction with a given software program. There are six software programs (i.e., Job Quest, Labor Market Access, Life Step, Oasys, RAVE, and other). There are four categories of methods. Each are a combination of DOT codes accessible by software: (1) WF, MPSMS, SVP; (2) GOE, DPT; (3) GOE, DPT, GED; and (4) other. Cells reflect the number of cases worked per given combination of method and program. This table is repeated nine times, one for each of the categories of TSA usage worked in 1998 as reported in number ten above.
Instrumentation

A questionnaire (Appendix A) designed by this researcher was used to survey the participants in this study. It consisted of 33 questions in three parts. The first asked questions about forensic and casework experience. The second part asked questions about perceived self-efficacy in doing TSA. The third part asked questions about the demographics of the responder. The questionnaire was pilot tested and suggestions of the participants were incorporated into the instrument. Self-efficacy ratings are modeled after the Skills Confidence Inventory (SCI; Betz, Borgen & Harmon, 1996). No pilot test data was used in the final data analysis.

Data Collection Procedures

Data was in cooperation with IARP. A letter was received from Rob Taplansky, executive director of IARP dated October 12, 1999 which confirmed the professional society's participation.

A Salant and Dillman telephone survey process was (Salant, 1994). A random sample of 133 people was selected. The first 75 were in the initial round of telephone contacts. First, a letter signed by the executive director and this researcher, was sent to all persons in the group of 75 describing the study and indicating that a telephone contact was to be made within a designated period of time. The letter contained a statement of support from the IARP executive director, and emphasized how critical their personal knowledge is to the assessment of TSA. A sample introductory letter is found in Appendix B.
Assurances were made that data gathered will be kept confidential, but for research tacking purposes total anonymity is not be possible. The letter indicated that the Human Subjects Committee at the OSU Research Foundation approved the study.

A postcard was included with the letter that the subject was to return. On the card, the subject could indicate that he or she was not interested in being part of the study, or the subject could indicate the day and time it is most convenient to call. All persons who indicate they were not interested in participating in the study were replaced from the remaining persons in the original sample.

About two weeks after the letter, the first round of telephone calls was made according to the information gathered by postcard. At the time of contact, the person could take the survey or schedule an appointment for a later time. Tacking numbers were assigned to the questionnaires. The necessity of tracking was explained to the participants, and they were again be assured of confidentiality of the responses, and the critical nature of their personal knowledge of TSA. Pilot testing indicated that each survey would take 20 minutes to complete. Calling continued until a total of 75 subjects were reached. Each additional person called above the first 75 was selected from the originally drawn random sample. Contact was made with the additional persons in the same manner as the original 75.

It was anticipated that if in the event the response rate was insufficient, several courses of action could be considered. First, non-responders could be called again to solicit their responses to the questionnaire by phone. Second, remaining members of the group of 135 could be used. Third, since unrestricted access to the
IARP/FS membership roster has been offered, thus additional subjects could have been drawn to participate in the study. Fourth, other organizations could have been considered for participation in the study. Limitations of this last approach have already been identified above. None of these anticipated courses of action were necessary, since 75 completed questionnaires were obtained within the original selection of 135 persons.

Data Analysis

This study is based on a sample of 75 of the 301 members of IARP/FS. Though this is a convenient group to study, it none the less meets the conditions of power analysis. The unit of analysis for this study is the cases worked by the professional and not the person. N for cases in the study is 13,164. N for number of TSA's done is 8,484.

Poisson regression (PR; McCullagh, 1983) was used to analyze all the relationships between the selected descriptive variables, the predictor practice variables and the criterion variables. The criterion variable is a six by four matrix which represents the variations in software used and method used. There are nine matrices, one for each type of case group or professional activity.

PR is appropriate for this analysis for several reasons. First, the study deals with count data, not metric data. Second, while there are 24 cells in each case type matrix, it is probable that there will be empty cells. Thus, the distribution of the data for this study is likely to be skewed. Traditional regression assumes a symmetrical distribution. Third, PR is also non-negative. Were as traditional regression might
produce predicted a value that are negative, PR does not. Fourth, the variance in PR increases as the mean increases. This ability will be useful as the numbers inside the cells increase as expected. Traditional regression assumes a constant variance. PR uses a log transformation that adjusts for skewness and prevents the model from producing negative predicted values. PR models variance as a function of the mean.

Descriptive analysis addressed the demographic data obtained. Frequency counts, central tendency, range, proportions, and variance are reported as appropriate for each variable according to its level of measurement. An attempt was made to obtain an accurate picture of present forensic rehabilitation practice.

Multivariate analysis is used to analyze the relationships between the predictor and criterion variables. Suspected analysis of each research questions follows.

Question 1—

H. There are multivariate relationships which can be identified between education level, length of time in rehabilitation, length of time doing forensic work, numbers of cases worked in various professional activity categories, the numbers of cases on which TSA was used, and a) the software used to do TSA analysis, b) the method used to do the analysis, and c) the case type on which it is used, each dependent variable taken individually.

Education level is a six level ordinal variable. Length if time in rehabilitation is an interval variable. Number of cases worked in various professional activity categories is a ratio variable. Numbers of cases on which TSA was done is a ratio variable. Software is a six level categorical variable. Method is a four level
categorical variable. Case type is nine level categorical variable. Multiple regression analysis will be used to investigate the relationship between the multiple descriptive and predictor variables and each of the criterion variables taken individually.

Question 2—

H₂ There are multivariate relationships between education level, length of time in rehabilitation, length of time doing forensic work, numbers of cases worked in various professional activity categories, the numbers of cases on which TSA was used, and the patterns of TSA application.

Education level is a six level ordinal variable. Length if time in rehabilitation is an interval variable. Number of cases worked in various professional activity categories is a ratio variable. Numbers of cases on which TSA was done is a ratio variable. The criterion variable is "Patterns of TSA Application". This is a six by four table of ratio data. It consists of the number of times a given TSA method was used in conjunction with a given software program. There are six software programs (i.e., Job Quest, Labor Market Access, Life Step, Oasys, RAVE, and other). There are four categories of methods. Each are a combination of DOT codes accessible by software: (1) WF, MPSMS, SVP; (2) GOE, DPT; (3) GOE, DPT, GED; and (4) other. Cells reflect the number of cases worked per given combination of method and program. This table is repeated nine times, one for each of the categories of TSA usage worked in 1998. Because this is count data and the potential for skewed data, Poisson regression analysis will be used to analyze this relationship.
Question 3—

H. There are multivariate relationships between education level, length of time in rehabilitation, length of time doing forensic work, numbers of cases worked in various professional activity categories, the numbers of cases on which TSA was used, and the software program that is used to do TSA and the case types to which it is applied.

Education level is a six level ordinal variable. Length if time in rehabilitation is an interval variable. Number of cases worked in various professional activity categories is a ratio variable. Numbers of cases on which TSA was done is a ratio variable. The criterion variable are: "the software program that is used to do TSA," which is 6-level categorical variable and "case type," which is a nine-level categorical variable. Because this is count data and the potential for skewed data, Poisson regression analysis will used to analyze this relationship.

Question 4—

H. There are multivariate relationships between the level of perceived self-efficacy in executing TSA as rated on the self-efficacy section of the questionnaire designed for this study, and whether software is used to do TSA, which program is selected, and the patterns of TSA application.

Level of self-efficacy is an ordinal variable and represents a sum of scores on the self-efficacy questions in the questionnaire. The criterion variable was "Patterns of TSA Application". This is a six by four table of ratio data. It consists of the number of times a given TSA method was used in conjunction with a given software
There are six software programs (i.e., Job Quest, Labor Market Access, Life Step, Oasys, RAVE, and other). There are four categories of methods. Each are a combination of DOT codes accessible by software: (1) WF, MPSMS, SVP; (2) GOE, DPT; (3) GOE, DPT, GED; and (4) other. Cells reflect the number of cases work per given combination of method and program. This table is repeated nine times, one for each of the categories of TSA usage worked in 1998. Because this is count data and the potential for skewed data, Poisson regression analysis will used to analyze this relationship.

Threats to Validity

There are four threats to internal validity in this study (Campbell & Stanley, 1966). They are history, maturation, selection, and mortality. The history threat is the idea that events other than those measured by this study account for the variation in the criterion. The advent of a new software package may have influenced software selection. This event may have been the reason for the software selected rather than the reasons suggested by the hypotheses in this study.

The maturation threat is the concept that personalogical or psychological characteristics of the respondents was the cause for the variations in the criterion. Perhaps TSA methodology was determined by the effectiveness of marketing strategies or persuasion, ease of use, or heuristic appeal.

Selection is also recognized as a threat because the group used in this study was a convenience group. Though this limitation was significant to the interpretation of the results of the study, important results were believed to still be likely because
IARP/FS represents the largest organized group of forensic rehabilitation professionals.

Finally, mortality is the concept that those non-respondents to the survey are in some way different in their opinions than those who responded. Potentially was it possible that non-responders were different on one or more germane characteristics than those who did participate; thus their opinions could have allowed for different conclusions regarding the criterion in this study.

The threat to external validity in this study was principally the interaction of selection and the criterion variable (Campbell & Stanley, 1966). That is, the methodological and utilization patterns of this group may not be representative of the universe of all forensic rehabilitation professionals (Campbell & Stanley, 1966). This threat caused concern, but because of the prominence of this group of professionals, important results were believed to be achievable.

Expected Results

It was expected that this survey was likely to uncover relationships between demographic characteristics of forensic practitioners, perceived self-efficacy in doing TSA, the uses made of the TSA process, and the methods that are use to do TSA. The prediction of type of method and when to apply TSA to casework would have been useful in determining the heterogeneity or homogeneity of practice utilization of TSA. Such information is needed for future research on empirically based protocols for the TSA process, and the establishment of standards of best practice for the forensic rehabilitation community.
CHAPTER 4

FINDINGS

This chapter presents the findings of the study. The purpose of this study was to differentiate Transferable Skills Analysis (TSA) methods and utilization patterns by forensic case type.

Introduction

The study involved an analysis of the casework of selected members of the Forensic Section of the International Association of Rehabilitation Professionals (IARP/FS). Demographic data were used to examine the differences among the study’s participants. Data regarding casework experience (i.e., length of time in forensic practice) and number of cases in selected practice activities (e.g., case management) was used to identify and describe the individual’s forensic practice activity. Whether or not software was used, the types of software packages used, and the algorithm selected within the software package determined TSA methodology and patterns of utilization. Multivariate analysis was used to investigate these relationships.
Research Questions

The research questions associated with this inquiry were:

Question 1—Are there multivariate relationships which can be identified between the Software Program used to do TSA analysis and the Method used to do the analysis.

Question 2—Are there relationships that can be identified between the Case Types on which TSA is used and the Method selected?

Question 3—Are there relationships between which Software Program is used to do TSA and the Case Types to which it is applied?

Question 4—Are there relationships between perceived self-efficacy in executing TSA, and which Software Program is selected, the Methods used, and Case Types to which TSA is applied?

Review of Methodology

This study randomly contacted 75 members of IARP/FS. Contact was made by phone during the first three weeks of November 1999. The units of analysis were the cases worked by the professionals contacted. Total number of cases worked by the participants was 13,164. Total number of cases on which TSA was done was 8,484. These numbers of cases significantly exceed the numbers expected during the research design phase of this study. Four thousand six hundred eighty (4680) cases did not have TSA done, or 36% of the total.

Poisson regression (PR, McCullagh, 1983; McCullagh & Nelder, 1989; Neter, Kutner, Nachtsheim & Wasserman, 1996) was used to analyze relationships among the
criterion variables. The criterion was a six by four matrix that represented the variations in use of software programs and method. There were nine matrices, one for each type of case type.

One of the primary objectives of statistical analysis is to establish relationships among variables so that it is possible to predict a level or response in the criterion variable, Y, in terms of other independent predictor variables, X_1, X_2, ..., X_k. Formally, the focus of the analysis in this study was the analysis of the expected value of Y as a function of the known values of the other criterion variables as predictors variables, E(Y|x_1, x_2, ..., x_k).

Generalized linear statistical models (GLM) provide a useful way to do this analysis and are common to the social sciences (Neter, et al., 1996; Gardner, Mulvey & Shaw, 1995; Land & Nagin, 1996). There are several GLM models. There are models for analyzing quantitative responses (e.g., linear regression; multiple regression, analysis of variance, and analysis of covariance). There are binomial regression models for binary data (e.g., logistic regression, log-linear regression, and logit and probit models). Additionally, there are Poisson regression (PR) models used for analyzing count data (e.g., log-linear models for contingency tables and hazard models for survival data; McCullagh & Nelder, 1989; Neter, et al., 1996).

PR was appropriate for this analysis for several reasons (McCullagh, 1983; McCullagh & Nelder, 1989; Breiman, Freidman, Olshen & Stine, 1984; Chambers & Hastie, 1992). The study dealt with count data, not metric data. The unit of analysis was the case, and case counts were used in the statistical model. Although there were
24 cells in each case type matrix, there were many empty cells due to the sparseness of some of the case counts. Thus, the distribution of the data in this study was skewed, and was expected to be a priori. Actually, the data were over dispersed (i.e., the variance in the data was greater than the mean), and required a statistical adjustment to correct for the over dispersion. Traditional regression models (e.g., least squares regression or sum of squares ANOVA) assume a symmetrical distribution, and thus could not be used in this study. Additionally, PR produces non-negative results. Because count data are always positive and a negative case does not make qualitative sense, the negative correlations sometimes produced by other regression options are not appropriate to this data. Whereas traditional regression models might produce a predicted value that is negative, PR does not. Further, the variance in PR increases as the mean increases. This ability was useful when the numbers inside the cells increase as expected. Traditional regression assumes a constant variance. In PR, log transformations that adjust for skewness are used to prevent the model from producing negative predicted values. Finally, PR models variance as a function of the mean, which is useful with count data.

Descriptive analysis was used to address the participant demographic data and to describe the nature of the cases involved in the study. Multivariate analysis was used to analyze the relationships among the criterion variables.

This chapter is divided into two sections. The first section is a discussion of the demographic factors of the participants, as well as, the categorical data related to
the cases included in the study. The findings from the multivariate analysis are presented in section two for each research question.

Section One of the Findings—Descriptive Analyses

Before reviewing the multivariate findings implicated by the research questions, it is pertinent to look at the demographic factors of the forensic professionals who participated and the categorical data regarding the cases included in the study.

Participant Demographics.

Total IARP/FS membership is 301. From the sampling frame supplied by the IARP administrative office, members residing outside of the U.S., faculty of The Ohio State University, this author, and persons participating in the instrument field trial were culled (i.e., 7 persons). From the remaining (N = 294), 135 names were randomly selected. The persons selected were sent a post card that alerted them to being selected and allowed them to decline participation. Seventeen persons returned postcards saying that they did not want to participate. Additionally, 11 persons when contacted declined to participate, most indicating that they did not do TSA. Calls were made sequentially through the sample list until 75 people were contacted who were willing to participate. It was estimated that 75 persons would produce sufficient cases to satisfy the needed power requirements. In actuality, the N for cases determined by the a priori power analysis was exceeded. Of the persons selected, 32 were not called. The sample consisted of 103 persons. Of the total IARP/FS membership, 24.9% (N = 75) participated in the survey. A return rate of 72.8% of the sample was obtained. These data are presented in Table 4.1.
Table 4.1. Membership and Sample Data

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>% Total Membership</th>
<th>(N = 103)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Membership</td>
<td>301</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>Initial Draw</td>
<td>135</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drawn But Not Contacted</td>
<td>32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total in Survey</td>
<td>103</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postcard Refusals</td>
<td>17</td>
<td>16.5</td>
<td></td>
</tr>
<tr>
<td>Phone Refusals</td>
<td>11</td>
<td>10.6</td>
<td></td>
</tr>
<tr>
<td>Total Refusals</td>
<td>28</td>
<td>27.1</td>
<td></td>
</tr>
<tr>
<td>Total Participants</td>
<td>75</td>
<td>24.9</td>
<td>67.6</td>
</tr>
</tbody>
</table>

Geographic distribution of the participants was not even throughout the United States. The sample favored the western and southern states. Twenty-six participants came from the western states, and twenty-five participants from the southern states. The New England states had thirteen participants and the Midwest had eleven participants. This distribution is roughly similar to the total IARP national membership (IARP Membership Directory, 1999). However discrepancies were noted. The North East was overrepresented in the sample by 3.5%. The South was
also overrepresented in the sample by 5%. The Midwest and West were underrepresented by 3.4% and 4.7% respectively. Canada and Puerto Rico each had no participants in the sample and thus were underrepresented in relation to their totals in the national membership 0.3% and 0.1% respectively. These data are presented in Table 4.2.

<table>
<thead>
<tr>
<th>Region</th>
<th>Sample</th>
<th>Membership</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (%)</td>
<td>N (%)</td>
</tr>
<tr>
<td>Northeast</td>
<td>13 (17)</td>
<td>531 (13.5)</td>
</tr>
<tr>
<td>South</td>
<td>25 (33)</td>
<td>724 (28.0)</td>
</tr>
<tr>
<td>Midwest</td>
<td>11 (15)</td>
<td>477 (18.4)</td>
</tr>
<tr>
<td>West</td>
<td>26 (35)</td>
<td>1028 (39.7)</td>
</tr>
<tr>
<td>Canada</td>
<td>0</td>
<td>9 (0.3)</td>
</tr>
<tr>
<td>Puerto Rico</td>
<td>0</td>
<td>3 (0.1)</td>
</tr>
<tr>
<td>Total</td>
<td>75 (100)</td>
<td>2592 (100.0)</td>
</tr>
</tbody>
</table>

Table 4.2. Geographic Distribution of Participants

The participants practiced in various states, and many in more than one state. Thirty-four practice states and Mexico and Canada were represented. The states with the largest number of participants in practice were California, Florida, New York, and
Washington. Thirty participants indicated that they practiced in two states, 12 practice in three states, 22 in four states, and 2 (though residing in the U. S.) practiced in foreign countries, one each in Mexico and Canada. These data are presented in Table 4.3.

<table>
<thead>
<tr>
<th>States Where Participants Practiced*</th>
<th>Total Number of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA, FL, NY and WA</td>
<td>22</td>
</tr>
<tr>
<td>AL, NE, RI, VA</td>
<td>12</td>
</tr>
<tr>
<td>AZ, CT, GA, HI, IL, LA, MS, NC,</td>
<td>30</td>
</tr>
<tr>
<td>OH, OK, OR, PA, TN, TX, UT</td>
<td>22</td>
</tr>
<tr>
<td>CO, DC, DE, ID, KY, KS, LA, MD,</td>
<td></td>
</tr>
<tr>
<td>MI, MO, MT, NJ, NV, SD, VT, WV</td>
<td></td>
</tr>
<tr>
<td>Mexico, Canada</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 4.3. Distribution of States Where Participants Practice.

Note. These numbers will not total to 75 because participants practiced in more than one state.

*The state abbreviations in this Table are standard U. S. Postal Service abbreviations.
The participants exhibited lengthy rehabilitation and forensic experience. The range for the length of time in rehabilitation was 4 years to 45 years. The mean length of time in the rehabilitation field was 19.8 years. The range for length of time in forensic practice was 3 to 45 years. The mean for time in forensic practice was 11.5 years. Analysis of central tendency and dispersion shows that the distribution for both years in rehabilitation and years in forensic practice is nearly symmetrical.

These data are shown in Table 4.4.

<table>
<thead>
<tr>
<th></th>
<th>Mode</th>
<th>Medium</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years in Rehabilitation</td>
<td>20</td>
<td>20</td>
<td>19.80</td>
<td>6.93</td>
</tr>
<tr>
<td>Years doing Forensics</td>
<td>12</td>
<td>10</td>
<td>11.50</td>
<td>6.92</td>
</tr>
</tbody>
</table>

Table 4.4. Distribution of Years of Practice Data

The most frequently occurring degree was a master's degree. Though four people had bachelor's degrees and two had juris doctor degrees. Several persons had more than one master's degree. One person had a degree in nursing. The data for this variable are presented in Table 4.5.
Table 4.5. Degree Distribution

Note. These data will not total to 75 and 100% because several persons had more than one degree.

The responses were varied for the question about participant's major field. As anticipated, rehabilitation counseling predominated with 40 participants. The "other" category had 19 participants, and their fields included: law, nursing, business, social work, and education. Counseling had 15 participants. These data are presented in Table 4.6.
The participants held a variety of certifications and most hold more than one. Six persons held no certifications. The most frequently held certifications were Certified Rehabilitation Counselor (CRC), Certified Case Manager (CCM) and Certified Disability Management Specialists (CDMS), in decreasing order. These data are presented in Table 4.7.

Table 4.6. Major Field Distribution.

<table>
<thead>
<tr>
<th>Field</th>
<th>N</th>
<th>% of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rehabilitation</td>
<td>40</td>
<td>53</td>
</tr>
<tr>
<td>Other</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>Counseling</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>Psychology</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

Note. These data do not total 75 and 100% due to several persons having more than one degree.
Table 4.7. Distribution of Certifications.

<table>
<thead>
<tr>
<th>Certification</th>
<th>N</th>
<th>% of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRC</td>
<td>60</td>
<td>80</td>
</tr>
<tr>
<td>CCM</td>
<td>39</td>
<td>52</td>
</tr>
<tr>
<td>CDMS</td>
<td>37</td>
<td>50</td>
</tr>
<tr>
<td>CLCP</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>CVE</td>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td>ABVE/D</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>ABVE/F</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Other</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>CEA</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>NCC</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>CDE</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Note. These data will not total to 75 and to 100% because participants had more than one certification. Identification of the certifications is as follows: Certified Rehabilitation Counselor (CRC), Certified Case Manager (CCM), Certified Disability Management Specialist (CDMS), Certified Vocational Evaluator (CVE), American Board of Vocational Experts/Diplomate (ABVE/D), American Board of Vocational Experts/Fellow (ABVE/F) Certified Earns Analyst (CEA), National Certified Counselor (NCC), Certified Life Care Planer (CLCP), and Certified Disability Examiner (DCE).
The participants belonged to a variety of other professional organizations in addition to their membership in IARP. Some, however, belonged to no other professional group. Twenty-four persons, or 32%, of the sample belonged to no organization other than IARP. The National Rehabilitation Association (NRA) led the group of additional memberships, followed by the National Rehabilitation Counseling Association (NRCA) and the American Counseling Association (ACA). These data are shown in Table 4.8.
Table 4.8. Distribution of Additional Professional Memberships.

Note. These data will not total to 75 and 100% due to participants belonging to more than one organization. Abbreviations are as follows: National Rehabilitation Association (NRA), National Rehabilitation Counseling Association (NRCA), American Counseling Association (ACA), American Rehabilitation Counseling Association (ARCA), American Rehabilitation Economics Association (AREA).

The survey asked each of the participants to estimate how they divided their professional time. On average, the participants spent 49% of their time on forensic activities, and 33.2% on case management. These data are presented in Table 4.9.
<table>
<thead>
<tr>
<th>% of Time Spent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forensics</td>
</tr>
<tr>
<td>Case Management</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>Business Admin.</td>
</tr>
<tr>
<td>Counseling</td>
</tr>
<tr>
<td>Voc. Eval.</td>
</tr>
<tr>
<td>Life Care Plan.</td>
</tr>
<tr>
<td>Labor Market</td>
</tr>
</tbody>
</table>

Table 4.9. Distribution of Professional Time

Perceptions of self-efficacy or confidence in the execution of TSA and in the utilization of the results were also measured by this study. This concept had 8 sub domains. A five-point Likert scale was used to measure confidence in 4 execution sub domains and 4 utilization sub domains (Appendix A). Descriptors for these scales were 1 = very little, 2 = little, 3 = moderate, 4 = high, and 5 = very high (Betz, Borgen & Harmon, 1996). The participants rated themselves as least confident in using software to perform TSA. This ability received a mean rating of 3.7 on a five-point scale, or a high moderate rating. The next lest confident ability was in differentiating between a worker trait and a work skill. This ability got a mean rating
of 3.9, which is also a high moderate rating. The highest confidence rating was a 4.6 for using TSA in Social Security cases, or a high rating. The overall rating of self-efficacy was 4.3, also a high rating. Perceptions of self-efficacy are highest in the Social Security Disability Determination process. Table 4.10 presents these data.

<table>
<thead>
<tr>
<th>TSA Skill</th>
<th>Mean Efficacy Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Executing TSA</strong></td>
<td></td>
</tr>
<tr>
<td>Without using software</td>
<td>4.2</td>
</tr>
<tr>
<td>Using software and Supplemental materials</td>
<td>4.2</td>
</tr>
<tr>
<td>Differentiating worker trait and work skill</td>
<td>3.9</td>
</tr>
<tr>
<td>Using software</td>
<td>3.7</td>
</tr>
<tr>
<td>Average mean rating for execution</td>
<td>4.0</td>
</tr>
<tr>
<td><strong>Utilizing TSA Results</strong></td>
<td></td>
</tr>
<tr>
<td>In Social Security Testimony</td>
<td>4.6</td>
</tr>
<tr>
<td>In case management</td>
<td>4.2</td>
</tr>
<tr>
<td>In forensic work</td>
<td>4.2</td>
</tr>
<tr>
<td>In counseling situations</td>
<td>4.2</td>
</tr>
<tr>
<td>Average mean rating for utilization</td>
<td>4.3</td>
</tr>
<tr>
<td><strong>Overall Rating</strong></td>
<td></td>
</tr>
<tr>
<td>Overall Mean Self-efficacy rating</td>
<td>4.3</td>
</tr>
</tbody>
</table>

Table 4.10. Self-Efficacy Ratings
Participant demographic data suggest that the participants were advanced in their experience in both rehabilitation and forensic practice. They mostly possessed advanced degrees and sometimes multiple degrees. Their academic backgrounds were varied and their degrees were in several professional areas. Perceptions of self-efficacy in the execution of TSA were at the moderate range when using software in the execution. Casework was equally as varied. It represented the database on which the research questions in this study were investigated.

**Casework Demographics.**

Case dispersion clustered around four principle categories: Rehabilitation Case Management, Social Security Disability, Workers Compensation, and Personal Injury. However, there were 19 different types of cases in total. Most case types were predetermined, but several were not anticipated (e.g., attorney malpractice) and were added as a result of the survey. Table 4.11 shows these data.
<table>
<thead>
<tr>
<th>Case Type</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anticipated Case Types</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case Management</td>
<td>1826</td>
<td>14.00</td>
</tr>
<tr>
<td>Counseling</td>
<td>170</td>
<td>1.30</td>
</tr>
<tr>
<td>Vocational Testing</td>
<td>680</td>
<td>5.00</td>
</tr>
<tr>
<td>Social Security</td>
<td>4843</td>
<td>36.90</td>
</tr>
<tr>
<td>Workers' Compensation</td>
<td>2969</td>
<td>22.90</td>
</tr>
<tr>
<td>Personal Injury</td>
<td>1604</td>
<td>12.00</td>
</tr>
<tr>
<td>Divorce/Custody</td>
<td>340</td>
<td>2.40</td>
</tr>
<tr>
<td>Medical Malpractice</td>
<td>291</td>
<td>2.20</td>
</tr>
<tr>
<td>Case Types in the &quot;Other&quot; Category</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life Care Planning</td>
<td>226</td>
<td>1.70</td>
</tr>
<tr>
<td>Attorney Malpractice</td>
<td>2</td>
<td>0.015</td>
</tr>
<tr>
<td>Product Liability</td>
<td>2</td>
<td>0.015</td>
</tr>
<tr>
<td>Lead Abatement</td>
<td>12</td>
<td>0.090</td>
</tr>
<tr>
<td>Federal Employee Liability Act</td>
<td>22</td>
<td>0.160</td>
</tr>
<tr>
<td>Wrongful Death</td>
<td>1</td>
<td>0.008</td>
</tr>
<tr>
<td>Long Term Disability</td>
<td>91</td>
<td>0.690</td>
</tr>
<tr>
<td>Wrongful Termination</td>
<td>55</td>
<td>0.410</td>
</tr>
<tr>
<td>Job Analysis</td>
<td>7</td>
<td>0.050</td>
</tr>
<tr>
<td>Railroad Retirement Board</td>
<td>6</td>
<td>0.050</td>
</tr>
<tr>
<td>Americans with Disabilities Act</td>
<td>17</td>
<td>0.120</td>
</tr>
<tr>
<td>Totals</td>
<td>13164</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Table 4.11. Distribution of Cases in the Study.
Software utilization was also clustered around 2 usage categories. The most often used software program in the study was LifeStep, followed closely by programs in the "Other" category. Software programs in this category include LIFECORP, Open Options, and ERISS. LIFECORP is currently associated with New Concepts Career Development Corporation, which was formerly part of Singer Educational Products, Inc. LIFECORP provides a variety of proprietary modular software programs. One module assesses TSA from a DOT perspective. Open Options is a Windows-based product used mainly in Michigan that provides a software interface between the DOT and local wage and labor market data. ERISS is a proprietary package used in California's Worker's Compensation system. Its use in that system has fostered its use in other venues (e.g., personal injury), but mostly in California.

However, the majority of the participants did not use any software to do TSA. They reported doing TSA manually using several methods: (a) VDARE (Sink & Field, 1981), (b) RAPEL (Weed, 1996), or (c) applying their own system based on "experience and training." Data regarding software utilization are presented in Table 4.12.
Software-based TSA methodologies determined *a priori* included the following methods. Method 1 involved the use of the DOT coding structures of Work Field (WF); Material Products, Subject Matter and Services (MPSMS); and Specific Vocational Preparation (SVP). Method 2 used Data, People, Things (DPT), and the Guide for Occupational Exploration (GOE) structures. Method 3 used DPT, GOE, and the General Educational Development (GED) codes. Method 4 included all other software algorithms or other reported methods. Utilization clustered in two methods categories. The most frequently used was Method 1. The next most frequently used...
was Method 4. Methods in this category included: (a) SVP, GOE, Aptitudes and GED levels in combination; (b) "Behavioral methods" and school performance matched to labor market; (c) labor market analysis and professional experience; and (d) census codes matched to Work Field and applied professional experience.

Methods data are shown in Table 4.13.

<table>
<thead>
<tr>
<th>Methods</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method 1 (WF, MPSMS, SVP)</td>
<td>3122</td>
<td>83.70</td>
</tr>
<tr>
<td>Method 4 (&quot;Other&quot;)</td>
<td>467</td>
<td>12.50</td>
</tr>
<tr>
<td>Method 2 (DPT, GOE)</td>
<td>69</td>
<td>1.90</td>
</tr>
<tr>
<td>Method 3 (DPT, GOE, GED)</td>
<td>69</td>
<td>1.90</td>
</tr>
<tr>
<td>Totals</td>
<td>3727</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Table 4.13. Distribution of TSA Software-driven TSA Methodology

Considering the number of case types on which TSA was done but no software was used (N = 4757) and the number of case types on which methods other than ones predetermined by the software package, 61.5% or 5224 cases had TSA methods which were not standardized or based on an established protocols found in the rehabilitation literature (Botterbusch, 1983; Botterbusch, 1985; Darling, Growick & Kontosh, 2000).

The variety of the casework done by the participants was not entry-level casework. It demanded advanced experience and professional skill. Further,
casework by the participants provided a sufficiently large database from which relationships among software, methodology, and case type could be investigated.

Section Two of the Findings—Multivariate Analysis

The survey elicited from each expert a three-dimensional table of counts of cases by Case Type, Software Program, and Method used in 1998. Originally the analysis plan was to model these counts with a mixed-effects Poisson regression (PR) model. The model would have a mixture of fixed and random effects. The fixed effects were to be Case Type, Software Program, and Method. The random effect was to be the identification of the expert.

Because of the unanticipated sparseness and over dispersion of the data, the analysis process needed to be altered to fit new models. The method of analysis used 3 two-dimensional models: Software Program/Method, Case Type/Method, and Case Type/Software Program. An over dispersion parameter (\( \phi \)) was used to correct for the data’s dispersion. Formally the model was:

\[
\text{Log E} (Y_\alpha) = \mu + \alpha_1 + \beta_1 + (\alpha \beta)_n
\]

\[\text{Var}(Y_\alpha) = \phi \text{E} (Y_\alpha)\]

\(\phi > 1\)

PR makes several assumptions. Among them are that the data are not normally distributed, and that the variance is equal to the mean. The data in this set were over dispersed causing the variance to be greater than the mean. Typically random effects (i.e., identification of the expert) inflate the standard errors of the estimates of fixed effects (e.g., Software Program). This model assumed over
dispersed Poisson variation, \( \text{var}(Y) = \phi E(Y) \). The over dispersion parameter was estimated by the data. For each fixed effect an over dispersion parameter \( (\phi) \) was calculated. They ranged from 6 to 10 in the 3 analyses, and were used to adjust the standard errors to more closely approach the mean.

The two-dimensional models could not use all levels of each variable; more sparse levels were omitted in order to fit models. Thus, TSA Methods 2 and 3 (See Table 4.13) were combined. Case Type Divorce/Custody, and Software Packages LMA and RAVE were dropped. In each case, this action was due to sparseness or having no data at all associated with them.

Findings Related to Research Question One

Question 1 — There are multivariate relationships that can be identified between the Software Programs used to do TSA analysis and the Method used to do the analysis.

Due to sparseness, only Method 1 using WF, MPSMS, SVP, and Method 4 "Other" were modeled. Additionally, The LMA software program and the RAVE software program were omitted. There was a main effect of Method reflecting the fact that the mean incidence of the first method is larger than "Other" method. There is no statistically significant interaction between Method and Software Program, suggesting that method did not significantly effect the choice of software program. Post hoc analyses revealed no pairwise relationships of significance among the individual levels of the variables. Table 4.14 reflects the relationship between Method and Software Program.
Table 4.14. Poisson Regression results for Method and Software.

Note. The denominator degree of freedom was 581 for Software Program and Method.

Findings Related to Research Question Two

Question 2 — There are relationships that can be identified between the Case Types on which TSA is used and the Method selected.

Method 2 using DPT, GOE, and Method 3 DPT, GOE, GED were combined. Case Type Divorce/Custody was omitted, each due to sparseness of data and model fit. No statistically significant relationship was found between Method and Case Type. The main effect was Case Type. Case Management, Social Security, Workers’ Compensation, and Personal Injury are the most frequently occurring case types. Thus, Case Type did not reflect the method selected. Post hoc analyses revealed no pairwise relationships of significance among the various levels of each
variable. Table 4.15 shows the results of the Poisson regression for Method and Type.

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>F</th>
<th>PR &gt; F</th>
<th>Chi Square</th>
<th>Pr &gt; Chi Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case Type</td>
<td>7</td>
<td>5.97</td>
<td>&lt;.0001</td>
<td>41.79</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>TSA Method</td>
<td>1</td>
<td>1.89</td>
<td>0.1692</td>
<td>1.89</td>
<td>0.1690</td>
</tr>
<tr>
<td>Type*Method</td>
<td>7</td>
<td>1.16</td>
<td>0.3205</td>
<td>8.15</td>
<td>0.3195</td>
</tr>
</tbody>
</table>

Table 4.15: Poisson Regression results for Case Type and TSA Method

Note. The denominator degree of freedom for Method and Type was 1166.

Findings Related to Research Question Three

Question 3 — There are relationships between Software Programs used to do TSA and the Case Types to which they are applied.

In this analysis due to sparseness of data and model fit, the Software Packages LMA and RAVE were omitted, and Case Types Counseling, Long Term Disability, Wrongful Termination, and LifeCare Planning were also excluded. There is no statistically significant relationship between Software Package and Case Type. Case Type was the only significant effect. Thus, Case Type did not determine the Software Program used in the TSA. Post hoc analyses revealed no pairwise relationships of
significance. Table 4.16 reflects the Poisson regression results for Software and Case Type.

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>F</th>
<th>PR &gt; F</th>
<th>Chi Square</th>
<th>Pr &gt; Chi Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>6</td>
<td>9.77</td>
<td>&lt;.0001</td>
<td>58.60</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Software</td>
<td>3</td>
<td>0.34</td>
<td>0.7955</td>
<td>1.02</td>
<td>0.7955</td>
</tr>
<tr>
<td>Type*Software</td>
<td>18</td>
<td>0.51</td>
<td>0.9560</td>
<td>9.14</td>
<td>0.9564</td>
</tr>
</tbody>
</table>

Table 4.16. Poisson Regression results for Software Program and Case Type.

Note. The denominator degree of freedom for Type and Software was 2053.

Findings Related to Research Question Four

Question 4 — There are relationships between perceived self-efficacy (SE) in executing TSA and utilizing the results, and which Software Program is selected, the Method used, and Case Types to which TSA is applied?

Simple linear analysis of the relationship of mean level of SE and Case Type showed no statistically significant relationship. There was an indication that the 2 variables co-varied and were linear. Table 4.17 shows these results.
<table>
<thead>
<tr>
<th>Mean Incidence Case Type</th>
<th>Correlation Coefficients</th>
<th>Rho P values</th>
</tr>
</thead>
<tbody>
<tr>
<td>With Social Security Cases</td>
<td>0.18096</td>
<td>0.1202</td>
</tr>
<tr>
<td>Without Social Security Cases</td>
<td>0.12433</td>
<td>0.2879</td>
</tr>
</tbody>
</table>

Table 4.17. Correlation between Mean Case Incidence and Self-Efficacy Scores

These data were plotted to further examine the relationship. Figures 4.1 and 4.2 graph the relation between the mean incidence of Case Type and Mean Overall rating of Self-Efficacy. The relationship is positive. It is effected by the overdispersion of the casework data. The relationship is roughly linear and has a correlation coefficient of .1243 without considering Social Security cases, and .1809 when these case are considered. Figures 4.1 and 4.2 on pages 123 and 124, respectively, are scatter plots of the relationship between Self-efficacy and Mean Incidence of Case Type with and without Social Security Case included respectively.
Figure 4.1. Mean Case Incidence vs. Mean Efficacy Scores including Social Security Cases
Figure 4.2. Mean Case Incidence vs. Mean Efficacy Scores without Social Security Cases
Since a rough linear relationship was discovered, PR was used to further analyze the covariance. Poisson regression was used to analyze Mean Overall Self-Efficacy (MSF) and Software Program, Method, and Case Type. No statistically significant results were obtained. The results are presented in Tables 4.18, 4.19, and 4.20.

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>F</th>
<th>PR &gt; F</th>
<th>Chi Square</th>
<th>Pr &gt; Chi Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSF</td>
<td>1</td>
<td>0.57</td>
<td>0.4491</td>
<td>0.57</td>
<td>0.4490</td>
</tr>
<tr>
<td>Software</td>
<td>3</td>
<td>0.27</td>
<td>0.8452</td>
<td>0.82</td>
<td>0.8453</td>
</tr>
<tr>
<td>MSF*Software</td>
<td>3</td>
<td>0.35</td>
<td>0.7875</td>
<td>1.06</td>
<td>0.7875</td>
</tr>
</tbody>
</table>

Table 4.18 Poisson regression results for Mean Self-Efficacy and Software Program.

Note: The denominator degree of freedom was 1173 for Mean Self-Efficacy and Software.
<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>F</th>
<th>PR &gt; F</th>
<th>Chi Square</th>
<th>Pr &gt; Chi Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSF</td>
<td>1</td>
<td>0.27</td>
<td>0.6022</td>
<td>0.27</td>
<td>0.6020</td>
</tr>
<tr>
<td>Method</td>
<td>3</td>
<td>0.42</td>
<td>0.5151</td>
<td>0.42</td>
<td>0.5150</td>
</tr>
<tr>
<td>MSF*Method</td>
<td>3</td>
<td>0.04</td>
<td>0.8386</td>
<td>0.04</td>
<td>0.8386</td>
</tr>
</tbody>
</table>

Table 4.19 Poisson regression results for Mean Self-Efficacy and Method.

**Note:** The denominator degree of freedom was 881 for Mean Self-Efficacy and Method.

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>F</th>
<th>PR &gt; F</th>
<th>Chi Square</th>
<th>Pr &gt; Chi Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSF</td>
<td>1</td>
<td>0.15</td>
<td>0.7017</td>
<td>0.15</td>
<td>0.7017</td>
</tr>
<tr>
<td>Case Type</td>
<td>5</td>
<td>0.57</td>
<td>0.7205</td>
<td>2.87</td>
<td>0.7205</td>
</tr>
<tr>
<td>MSF*Case Type</td>
<td>5</td>
<td>0.62</td>
<td>0.6814</td>
<td>3.12</td>
<td>0.6813</td>
</tr>
</tbody>
</table>

Table 4.20 Poisson regression results for Mean Self-Efficacy and Case Type.

**Note:** The denominator degree of freedom was 2671 for Mean Self-Efficacy and Case type.
Further analysis of the SE data was done by constructing classification tree models. Tree-based models provide classifications based on successively splitting the data into homogeneous subsets until it is infeasible to continue.

Though statistically significant relationships were not found, persons with very little to low moderate levels of confidence in TSA were more likely to use Job Quest. Persons with moderate levels were more likely to use LifeStep first, then Job Quest, and then LMA. Persons with moderately high levels of confidence were more likely to use LifeStep, then Job Quest, and then Oasys. Persons with high levels of confidence were more likely to use LifeStep, then LMA or Oasys equally, then Job Quest. Persons with high levels of confidence did not use any other software programs than these last four.

As confidence rose, counts for software program choice and case type utilization became more diverse. The varieties of software programs increased and the utilization counts were less disparate. The lower the rehabilitation professional's confidence was the stronger the reliance on Job Quest, then LifeStep. Also, as confidence lowered the utilization counts for software programs were less diverse.

Persons with high levels of confidence were more likely to be working on Social Security cases or workers compensation cases. Persons working on cases on which they are likely to testify had moderate or lower levels of confidence in TSA execution and the utilization of the results.
Summary

The purpose of this study was to differentiate TSA methods and utilization patterns by case type, and to identify if self-efficacy effects TSA applications.

Thirteen thousand one hundred sixty-four (13,164) cases were analyzed from the 1998 casework of 75 forensic rehabilitation professionals. Poisson regression was used to examine the relationships among TSA Method, Software Program, and Case Type. No statistically significant relationships were found. Further, practitioner self-efficacy in the execution of TSA was measured. Though the participants rated themselves high in efficacious execution of TSA and the utilization of the results, no statistically significant relationship was found between the perceived self-efficacy of the practitioner and the TSA Method, Software Program Case Type applications.
CHAPTER 5

DISCUSSION

This chapter contains five sections: (a) a summary of demographic findings and their relation to the literature, (b) a summary of the multivariate findings and their relation to the literature, (c) implications of the findings, (d) limitations of the study, and (e) recommendations for future research.

The purpose of this study was to differentiate Transferable Skill Analysis (TSA) methods and utilization patterns by forensic case type. Casework needs were hypothesized to determine the methods of execution of TSA and the patterns of its utilization. Counts of cases by case type, by software programs used, and by TSA method applied were gathered and statistically modeled to determine if relationships existed that were related to casework applications. The software program, the method selected (i.e., algorithm, or other process), and the case type to which the analysis was applied determined TSA methodology and patterns of utilization.

The participants in this study were selected members of the forensic section of the International Association of Rehabilitation Professionals (IARP/FS). This study was based on a sample of 75 of the 301 members. An a priori power analysis estimated that a sample size of 75 would produce sufficient numbers of cases to satisfy
power needs. The unit of analysis for this study was the cases worked by the professional. The N for cases in the study was 13,164. The N for number of Transferable Skill Analyses (TSA) done was 8,484 (Tables 4.1 and 4.11).

Descriptive statistics were used to report findings about the participants and incidence of case type. Poisson regression (McCullagh & Nelder, 1983; McCullagh & Nelder, 1989; Neter, Kutner, Nachtsheim & Wasserman, 1996) was used to analyze the multivariate relationships between Software Program, Case Type, and TSA Method. No statistically significant relationships were found between these three criterions. Contrary to expectations, Case Type did not predict which TSA method or software package the participants used.

Demographic Findings: The Participants, Self-efficacy, and Casework

Demographics reveal that most of the participants came from the Southern and Western States, 33% and 35% respectively (Table 4.2). Most (81.0%) practiced in more than 1 state (Table 4.3). The mean years of practice in rehabilitation was 19.8 and the mean years in forensics was 11.4 (Table 4.4). Of the participants, 93% had master's degrees (Table 4.5); 53% had degrees in rehabilitation counseling (Tables 4.6); 80% were certified CRC (Table 4.7); and 44% belonged to the National Rehabilitation Association in addition to IARP (Table 4.8). Of their professional time, 49% was spent in forensic practice (Table 4.9).

Regarding the participants' perceived levels of self-efficacy in the execution of TSA and the utilization of the results (Table 4.10), the highest rating of confidence
was doing TSA within the Social Security disability system. The lowest confidence rating was in being able to differentiate between worker trait and work skill.

Casework varied among 19 different case types (Table 4.11). The largest category of cases was Social Security followed by workers' compensation. Together Social Security and workers' compensation cases accounted for 59% of the total cases in the study. Personal injury cases added another 12% and rehabilitation case management added 14% of the cases. Of the cases that used TSA, 56% had TSA done without the use of software (Table 4.12).

These demographics support the background characteristics for rehabilitation and forensic practice found in the literature. Education and experience are seen as important for the training, certification, and performance of rehabilitation counselors. Several authors support advanced education in order to fully assume the counselor role in rehabilitation (Berven, 1979; Harrison & Lee, 1979; Leahy & Holt, 1993; Leahy, Shapson & Wright G. N., 1987; Matkin, 1983).

Further, the impact of education and experience on rehabilitation outcomes has been investigated. Szymanski and Parker (Szymanski & Parker, 1989a) examined whether education and experience levels effected the closure rates of rehabilitation clients with severe disabilities. They initially concluded that novice master's degree counselors outperformed other inexperienced counselors. However, this study suggested experience aided the counselors with other types of degrees. Clients with severe disabilities obtained more successful results if assigned to novice or experienced counselors with rehabilitation master's degrees, or to experience counselors with other
types of degrees. Inexperienced counselors with non-rehabilitation degrees were the least effective group in the study. However, further studies (Cook & Bolton, 1992; Szymanski, 1991; Szymanski & Danek, 1992; Szymanski & Parker, 1989a; Szymanski & Parker, 1989b) support the conclusion that counselors with masters degrees and two to 12 years of counseling experience have better client outcomes for clients with severe disabilities.

In the rehabilitation forensic literature, education and experience are also important. Field, Weed, and Grimes (Field, Weed & Grimes, 1986) define the vocational expert as one who possesses knowledge and skill in vocational assessment and placement. But to be seen as expert they identify advanced education, experience and professionalism as characteristics need in the professional's list of credentials. They suggest the degree that supersedes all other degrees is a "terminal degree or doctorate in a vocationally related area" (Field, et al., 1986, p. 24). Additional credentials include work experience as a rehabilitation specialist, working with "similar" clients (i.e., similar to the client being assessed), work in vocational assessment, and work in job analysis and placement. Also, in their professionalism category they cite membership in relevant professional associations, familiarity with current professional literature, and certification (i.e., CRC, NCC or CDMS; Table 4.7). Lastly, they indicate that publication in professional journals will enhance a professional's ability to be recognized as an expert by the courts.
The list of expert qualifications has expanded to include a wider range of vocational and assessment processes. Vander Kolk (Vander Kolk, 1993) lists six "desirable characteristics" that a vocational expert should have:

1. A masters degree in rehabilitation and certification in the field. These two are seen as the minimal academic credentials.

2. Ability to evaluate client history, abilities, interests, psychosocial status, skills, and motivation.

3. Ability to evaluate jobs, the labor market, employer attitudes, job-seeking skills, rehabilitation and medical services, and community attitudes.

4. Two years of post-master's degree supervised experience working with persons who have a disability. The experience should include provision of vocational rehabilitation and related services.

5. Membership in at least one professional organization related to vocational rehabilitation, and familiarity with current rehabilitation literature.

6. Ability to present client information and conclusions in written (i.e., report) or oral (e.g., deposition, trial) form so that various parties can obtain a clear understanding of the client's vocational status (Vander Kolk, 1993, p. 122).

Vander Kolk's expansion is important for several reasons. It addresses the need for holistic assessment of an individual across several domains of behavior.
Implicit in this assessment is the ability to synthesize the information obtained to achieve a clear understanding of the client. Further, Vander Kolk includes the need to assess skill as an important domain of behavior. One of the recent efforts by the U. S. government has been the identification of the basic skill set needed for workers entering the workforce (The Secretary’s Commission on Achieving Necessary Skills, 1991a). Additionally, there has been school-to-work programs which attempt to facilitate the transition to work (The Secretary’s Commission on Achieving Necessary Skills, 1991b). Further, specific skill sets for business specialties are in development (National Skill Standards Board, 1999).

To the above list of credentials has recently been added an important qualification for expert testimony—the scientific basis of the testimony. In 1993, the U. S. Supreme Court issued an opinion regarding the admissibility of scientific evidence (Daubert v. Merrell Dow Pharmaceuticals, Inc., 1993). Though this qualification directly applies to the evidence being given, it none-the-less sets standards for the behavior of forensic rehabilitation professionals regarding the preparation of their work. Implied herein are the requisite professional skills necessary to produce the level of testimony demanded by the court. This requirement was an impetus for this study.

Data in this study support the importance of these areas as the credentials in used in forensic rehabilitation. The participants were practicing forensic rehabilitation professionals. Implicit to this practice is the successful acceptance of their backgrounds by the court system. In the voir dire process a testifier’s background is
examined and cross-examined for its education level, experience, and professional activities. These areas are evaluated by the judge and accepted or not accepted as the qualifications of an expert. Further the participants’ confidence in their ability to assess skill and skill transfer was measured by this study. The perceived self-efficacy in professional skill supports the Vander Kolk requirements.

The Research Questions and Explanation of the Findings

These findings are summarized individually for each research question. However, the findings’ relationship to the literature is best understood if Questions 1 through 3 are discussed together, and Question 4 is discussed separately.

Question 1 — Are there multivariate relationships that can be identified between the software used to do TSA analysis and the method used to do the analysis?

No statistically significant relationship was found between TSA Software and Method used to do TSA (Table 4.14). The TSA Method that used the DOT-based codes WF, MPSMS, and SVP was used most frequently. Thus, which TSA software program was used did not predict which method would be used to do the analysis.

That WF, MPSMS, SVP are used in combination most frequently by the participants is likely due to the prominence of the use of the SSA definition of TSA (20 CFR 401.100 404.1568 (d)(2)). This definition was reflected in the frequency of the counts for Method in this question.

Question 2 — Are there relationships that can be identified between the Case Types on which TSA is used and the Method selected?
No statistically significant relationship was found between Case Type and TSA Method (Table 4.15). Case management, Social Security, and workers' compensation were the most frequently occurring case types. However, Case Type did not predict which Method was used in doing TSA. Regarding TSA utilization, 36% of the total number of cases did not have any TSA done on them. Also, of the cases with TSA, 56% of those cases did not use standardized Methods.

Question 3 — Are there relationships between which Software Program is used to do TSA and the Case Types to which it is applied?

No statistically significant relationships were identified between Case Type and Software Program used (Table 4.16). Case Type did not predict which Software Package was used to do TSA for the case. The unexpected number of case types and the over dispersion of counts (i.e., that the data's variance was greater than its mean) among them had likely impact on the results obtained in these three research questions.

The lack of statistically significant relationships among these criterions was not expected. It was hypothesized that casework needs would determine TSA method and utilization. The inability to predict methodology or software program use suggests other selection criteria than the ones measured in this study might be in use. There are several possible explanations for these results. These findings might reflect the participants' recognition of the limitations of the TSA methodology that they used, or the lack of empirically derived, and clinically standardized methods of TSA execution.
Casework in Social Security and workers' compensation (i.e., the most frequently occurring types), because it is grounded in nonjudicial grievance (Havranek, 1997; Social Security Administration, 1998), is subject to less rigorous cross-examination than casework that might find its way into the court system. In court, not only is the methodology under scrutiny, but the expert's background, professional standards, and work processes are as well. Finally, it is also possible that the over dispersion (i.e., that the data's variance was greater than its mean.) of the data contributed to the lack of findings in these questions.

The data in this study attest to the wide application of assessment of individuals using TSA. Fundamental to the TSA process is the synthesis of a variety of domains of behavior. TSA assesses skills and their application to work process (Field, et al., 1986; McCroskey, Wattenberger, Field, & Sink, 1977; Sink & Field, 1981). Additionally, TSA is used in a wide variety of case types (Table 4.11). However, this study points to a problem with TSA as an assessment tool.

Fundamental to any assessment instrument is the construct on which it is based. Constructs have three important and necessary properties. First, they are abstractions of empirical events. Second, because they are abstractions, they are separate from one's immediate sensory experience. Seemingly more objective, abstractions are thus essential for the formation of scientific law (Murphy &
Davidshofer, 1998). Third, all constructs are related to "real-world phenomenon" (Walsh & Betz, 1995, p. 66).

Literature reviewed for this study attests to the lack of a universally accepted construct for the phenomenon of skill transfer (Office of Hearings and Appeals, 1990; Saxon & Spitznagel, 1995; Sink & Field, 1981; Watters, 1984). This lack of agreement may have affected (i.e., increased) the numbers of cases that used non-software-base TSA methods. Further, lack of a construct effects the validity of the process. This study calls into question the construct validity of the TSA process as currently practiced.

The literature identifies three TSA methodologies: the SSA method, the GOE method, and the VDARE method (Darling, Growick & Kontosh, 2000). Each of these three methods was found in this study (Table 4.13). Each of these methods are identified as applicable to a wide range of casework. However, differential applications of TSA methodology are not identified. Each author of a unique TSA process (Field & Weed, 1989; Saxon & Deutsch, 1976; Social Security Administration, 1998) does not identify unique applied circumstances for the use of TSA. Discussion instead is centered on the overall need to identify skill transfer and not on the application of one methodological type to unique case needs (Field & Weed, 1989; Saxon & Deutsch, 1976; Social Security Administration, 1998). Given the importance of career assessment in rehabilitation planning (Klein, Wheaton, & Wilson, 1997), the construct validity of TSA and its impact on outcomes seems problematic.
Question 4 — Are there relationships between perceived self-efficacy in executing TSA, and which Software Program is selected, and the methods of doing TSA, and patterns of TSA application to Case Type?

The mean self-efficacy rating of the participant's level of confidence in executing TSA and in subsequently utilizing the results was 4.3 on a 5-point scale. Analysis shows that there was no statistically significant relationships between Self-Efficacy and Software Program, Method or Case Type (Tables 4.17, 4.18, 4.19 and 4.20). Scatter plots reveal the relationship between the predictor variable and the criterion variables were roughly linear (Figures 4.1 and 4.2).

Although no statistically significant relationships were found, in general, participants were more confident when working Social Security cases and workers' compensation cases. They were generally less confident when working cases where they were likely to have to give court room testimony.

Findings support the anticipated level of the participants' overall self-efficacy (Tables 4.4 and 4.10). Initially, career self-efficacy (Betz & Hackett, 1981) was an attempt to explain two problems related to women's career development. The first is avoidance behavior or women's under representation in male-dominated careers (e.g., engineering, and mathematics). The second is persistence behavior or an under utilization of women's talents in career activities. The Betz and Hackett study measured perceived self-efficacy in educational requirements and job duties for 10 "traditional" occupations (Betz & Hackett, 1986). The study concluded that self-efficacy was an important consideration in career choice. Since then, career self-
efficacy has been applied to both women and men (Williams & Betz, 1994), and supported by extensive research (Lent, Brown & Larkin, 1986; Lent, Brown & Larkin, 1987; Nevill & Schlecker, 1988; Post-Krammer & Smith, 1985; Taylor & Betz, 1983; Taylor & Popma, 1990; Williams, 1993).

Career self-efficacy (Betz & Hackett, 1981; Betz, 1992) is reflected in three domains of behaviors regarding choice: avoidance behaviors, performance behaviors, and persistence behaviors. Choice versus avoidance behavior results in commitments individuals make regarding career choice and also career activities. The commitment of the participants in this study to rehabilitation as a profession and the length of time each has been in practice (Table 4.4) exemplifies choice behavior. The additional commitment to the specialty of forensic rehabilitation suggests that the high levels mean overall perceived self-efficacy (Table 4.10) were correctly expected.

Performance behaviors are reflected in the expression of the participant's confidence of their effort in the execution of TSA, and the confidence in the utilization of the results. The mean rating for execution was 4.0 and for utilization was 4.3. These high moderate ratings support the theory's premise (Table 4.10).

Additionally, persistence behaviors are also a reflection of high levels of perceived self-efficacy and result in longer periods of dedication to a career activity. The range for time spent in forensic activities was three to 45 years. The mean was 11.5 years (Table 4.4). These data support the career self-efficacy expectations and demonstrate a stability in the field.
The on-going development of career self-efficacy theory has included its application to career decision-making (Taylor & Popma, 1990; Osipow, 1999). With the increasing need for individuals to face multiple life and career transitions has come the need to intervene in career decision problems. Osipow (Osipow, 1999) identifies two concepts related to the inability to make career decisions. Career indecision is one. This concept is viewed as developmental and is a phase that most persons will pass through as they reach a decision. The second is indecisiveness. This concept is not a part of ordinary human development. It is rather a personal trait that spans most situations where decisions need to be made, and indecision results as a customary pattern of the individual's condition.

Data in this study as shown by mean levels of length of professional participation suggest a stability of practice in the forensic rehabilitation (Table 4.10). Length of time in the field may indicate a lack of indecisiveness among the participants toward their decision to stay in rehabilitation or forensics.

Though no statistically significant relationships were found among the criterions, the study provides a baseline of present forensic practices of rehabilitation professionals. The diversity of practice was not anticipated. Variations in case types totaled 19 (Table 4.11). The range of years of total rehabilitation practice was 4 to 45 years, and is a range wider than what was expected.

Considering total cases studied, 36% of the casework involved other types of cases that did not use TSA (Table 4.11). This work included non-forensic rehabilitation case management, life care planning, and vocational service provision. This volume
is notable. The participants spent 49% of their time on forensic activities and 51% on non-forensic activities (Table 4.9). Thus, 36% of the casework consumed 51% of the participant’s time. This time allocation is possibly explained by the idea that case management and life care planning are time-consuming, labor-intensive activities.

It can also be inferred that the participants lacked a universally accepted standard of TSA best practice. TSA seems to lack an accepted construct. Its possible TSA processes may not be determined by the needs of the case. Payer sources’ needs might determine the type and utilization of the documentation to be generated by the vocational expert, or the comfort levels and work traditions the rehabilitation professionals may determine methodology. Considering the number of case types on which TSA was done but no software used (n = 4757) and the number of case types on which methods other than ones predetermined by the software package, 61.5% (5224 cases) had TSA methods that were not standardized or based on an established protocols found in the rehabilitation literature (Botterbusch, 1983; Botterbusch, 1985; Darling, et al., 2000).

Implications of the Findings

The findings of this study imply that universal protocols for the application and execution of TSA are not in standard use. The reason may be the lack of an accepted construct for transferable skill and for transferable skill analysis. Thus, issues regarding the validity of this process are of concern. Work recently done by Dunn (Dunn 1998) challenges the three conventional TSA methods in the literature, and offers some insights into variables which might be considered in protocol
development. He found that Work Field was more congruent than MPSMS between pre and post injury work for persons with industrial injuries. Also, levels of worker trait competency for post injury employment were less than the levels needed in the individual's work history. Additionally, as physical capacity diminished, the possession of higher levels of clerical and academic abilities become more valuable in placement occupations.

The IARP/FS study suggests casework need may not be the primary consideration in the decision of when to use TSA and how to do it. Other concerns not measured by this study may determine methodologies of analysis or patterns of utilization. For example, rehabilitation professionals practicing in forensic venues may rely on their experience, or other data (e.g., labor market data analysis) to arrive at conclusions about when and how skills transfer.

The necessary and sufficient conditions that need to be present to determine when and if work skills transfer remain undetermined, and are difficult to hypothesize for future research. The study found the TSA method most frequently used by vocational experts is the Social Security Administration's (SSA) definition of skill transfer. This method is also the one somewhat aligned with higher levels of perceived self-efficacy. This definition was not developed by empirical research, but by political process, and is DOT based (Social Security Administration, 1992a; Social Security Administration, 1992b; Social Security Administration, 1978a; Social Security Administration, 1978b). Not only is its use found in SSA cases, but in
various other case types as well. However, no discernable pattern of application of 
TSA methods to casework need was observed.

These findings imply that what is known about the scientific basis of the TSA 
process is insufficient to empirically derive the TSA protocols. This process is 
historically linked to occupational classification and disability determination. Given 
the advent of the O*NET, TSA method and its scientific basis is further in doubt. 
As the occupational classification changes from the DOT system to the new O*NET 
system, it is likely that new TSA methods will need to be developed. This change 
provides the opportunity to establish non-heuristically based methods and applications.

Limitations of the Study

This was an ex post facto study. Therefore the expected threats to internal 
validity of history, maturation, selection, and mortality (Campbell & Stanley, 1966) 
could not be controlled. Although it cannot be ascertained with certainty, it is hoped 
that the effects of history, maturation, and mortality are random and do not cause a 
systematic skewing of the data. An attempt was made to reduce these effects through 
random selection of participants. Self-selection on the part of the participants, 
however, reduces the salutary efforts or randomization. Consequently, the most 
significant threat to validity was selection.

Selection is recognized as a threat to both internal and external validity. 
Though the sample was randomly selected, it was a convenience sample. 
Additionally, because forensic section members self-select into membership in the 
section, the sample in this survey may not represent the whole of the forensic section
membership. The sample and their casework practices may be different in some significant way from the rest of the section membership.

Further, the sample was not stratified regionally so that proportional representation to the sampling frame was achieved in the sample. Additionally, multiple samples from the same frame were not drawn and analyzed. Thus, it could be argued that the TSA utilization patterns and process methodologies were unique only to the sample drawn.

Additionally, persons were given the option not to participate in the survey. It is possible that non-responders were different on one or more germane characteristics than those who participated. Their opinions could have allowed for different conclusions regarding the criterion in this study. Though this survey did achieve a 72.8% return rate, non-responders were not contacted.

Selection is also a threat to external validity. In this study, it is principally the interaction of selection and the criterion variables (Campbell & Stanley, 1966). The TSA methodological and utilization patterns of this group may not be representative of the universe of all forensic rehabilitation professionals. The IARP group does not represent the total universe of practicing forensic rehabilitation professionals in the U. S. Membership in the professional organization, like the section, is by self-selection. The potential interaction of selection and the criterion variables effected the generalization of results of this study.

Finally, gender was not asked in the questionnaire. This oversight limits the ability to analyze gender difference.
Recommendations for Future Research

Regarding particulars gleaned from the execution of this study, the instrument used did not assess gender. This oversight caused the inability to analyze the results differentially by gender. Also, given the statistical difficulties caused by the over dispersion of the data, it might have been useful to divide the 75 participants (adding one person to make the number even) into two subgroups. This division may have reduced the large variance in each subgroup to more reasonable and more useful amounts. Further, with two groups, comparisons between groups could have been made. Also the honesty and accuracy of the participants may have affected the results. Although there is no reason to doubt the veracity of the participants, most answered the questions put to them spontaneously with little or no preparation. Advanced preparation of the data may have made the results more accurate. It has already been identified that there seems to be a lack of an accepted construct for transferable skill. Thus, construct development and validity testing is warranted. Finally, rich qualitative comments were made by the participants regarding non-software TSA methodologies and their forensic practices. A qualitative study might be a useful investigation.

Globally, the results of this survey suggest the need for further research into the TSA process. The importance of the TSA concept is well established (Fine, 1955; Fine, 1957; Field, 1988; Kontosh, 1995; McCroskey, et al., 1977; Office of Hearings and Appeals, 1990; Pruitt, 1986; Saxon & Deutsch, 1976) in rehabilitation and disability determination. Thus, a finding of no statistically significant relationship
among the criterion variables in this study suggests that this important area is under researched and under investigated. The ability to predict methodology is useful in studying the heterogeneity or homogeneity of TSA application.

Methodological studies comparing the results achieved by independent experts on identical cases would help establish additional base-line data. Studies regarding the impact of one TSA process over another would help design empirically based protocols. Studies that measure outcomes achieved using established TSA protocols in disability determination and rehabilitation service delivery would advance the standards of best practice in vocational rehabilitation (e.g., Dunn, 1998).

This chapter has presented a discussion of the implications of the findings of this study, and of the relation of the findings to appropriate literature. Limitations of the study were itemized, and recommendations for further research were made.
TRANSFERABLE SKILL ANALYSIS (TSA) QUESTIONNAIRE

This is a telephone survey. The following will be read to each person contacted to participate in the survey.

Your participation in this research project is strictly voluntary. You may refuse to participate at any time. Your answers to these questions will be kept confidential and will be used only for research purposes. Further, no tracking numbers will be assigned to the questionnaire, thus assuring some measure of anonymity.

An affirmative response is necessary to continue.

Thank you for your time in participating in this survey!
Forensic Practice Information

1. How many cases did you work in 1998 in each of the following areas?
   a. Rehabilitation Case Management (any source) _____ (Q7)
   b. Counseling (as the primary service in the case) _____ (Q8)
   c. Vocational Testing (as the primary service in the case) _____ (Q9)
   d. Social Security Testimony _____ (Q10)
   e. Workers’ Compensation Disability Determination _____ (Q11)
   f. Personal Injury Litigation _____ (Q12)
   g. Divorce/Custody Litigation _____ (Q13)
   h. Medical Malpractice Litigation _____ (Q14)
   i. Other: _____ (Q15)
   j. Other: _____ (Q16)

2. Do you do Transferable Skills analysis (TSA)?
   a. No
   b. Yes

3. Since you do not do TSA, please describe how you determine vocational potential?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
4. Of the cases you did in 1998 as listed in question one, how many cases used TSA?

<table>
<thead>
<tr>
<th>Case Type</th>
<th>List Number of cases From Q1</th>
<th>Number which used TSA</th>
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<tbody>
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<td>Rehabilitation Case Management</td>
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<td>Vocational Evaluation</td>
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<td>Social Security</td>
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<td>Workers' Comp (Disability Determination)</td>
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<td>Personal Injury</td>
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5. Do you use software to do TSA?
   a. No
   b. Yes
6. Since you do TSA, but you do not use software, please describe the process used to do TSA:


7. For the ___ Rehabilitation Case Management cases which you did in 1998, which software program and TSA method did you use?

<table>
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<th>Software</th>
<th>WF, MPSMS, SVP</th>
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8. For the ___ Counseling cases which you did in 1998, which software program and TSA method did you use?

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<th>Software</th>
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</table>
9. For the Vocational Evaluation cases which you did in 1998, which software program and TSA method did you use?

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<th>Software</th>
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10. For the Social Security cases which you did in 1998, which software program and TSA method did you use?

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11. For the ___ of Workers' Compensation cases which you did in 1998, which software program and TSA method did you use?

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<th>Software</th>
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12. For the ___ of Personal Injury cases which you did in 1998, which software program and TSA method did you use?

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<th>Software</th>
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13. For the ___ of Divorce/Custody cases which you did in 1998, which software program and TSA method did you use?

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<th>Software</th>
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14. For the ___ of Medical Malpractice cases which you did in 1998, which software program and TSA method did you use?

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15. For the ___ of another type cases which you did in 1998, which software program and TSA method did you use?

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16. For the ___ of another type cases which you did in 1998, which software program and TSA method did you use?

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Practice Efficacy Information
For the following tasks and activities, please indicate your degree of confidence in your ability to perform that task. For these questions the following scale should be used:
1 = No confidence at all
2 = Very little confidence
3 = Moderate confidence
4 = Much confidence
5 = Complete confidence

17. Differentiating between worker trait (i.e. innate ability) transfer and work skill (the application of innate ability to a specific work process) transfer.

1  2  3  4  5

18. Executing TSA without software.

1  2  3  4  5

19. Executing TSA with software.

1  2  3  4  5

20. Executing TSA with software and supplemental materials.

1  2  3  4  5

21. Utilizing TSA (with or without software) in a therapeutic counseling situations.

1  2  3  4  5

22. Utilizing TSA (with or without software) in case management.

1  2  3  4  5

23. Utilizing TSA (with or without software) in forensic preparation, report writing, and testimony.

1  2  3  4  5

24. Utilizing TSA (with or without software) in Social Security Testimony

1  2  3  4  5

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Demographic Information

25. In which state do you do most of your professional practice?

Please list: ____________

26. How many years have you been practicing in rehabilitation?

28. How many years have you been doing forensic work?

29. What is your highest education degree?
   a. High School Diploma
   b. Associates Degree
   c. Bachelors Degree
   d. Masters Degree
   e. Ph.D.
   f. Other degree:

      Please list: ________________

30. In what field is your highest education degree? Please circle your answer.
   a. Rehabilitation
   b. Economics
   c. Psychology
   d. Counseling
   e. Other academic field:

      Please list: ________________
31. What certifications do you hold? Please circle all that apply.
   a. CRC
   b. CDMS
   c. CCM
   d. CVE
   e. ABVE/Diplomate
   f. ABVE/Fellow
   g. CEA
   h. NCC
   i. Other Certifications

   Please list: ____________________

32. Other than IARP, to which professional organizations do you belong? Please circle all that apply.
   a. NRA
   b. NRCA
   c. ACA
   d. ARCA
   e. AREA
   f. Other organizations:

   Please list: ____________________
33. What percentage of your total professional time is spent in the following activities (Total should equal 100%)?

a. Case Management  

b. Counseling (as a specific service)  

c. Labor Market Analysis  

d. Forensic Activities (preparation, report writing or testimony in any venue)  

e. Vocational Evaluation  

f. Other professional activity  

Please list: ___________________

34. Please provide any additional comments about this project or questionnaire:

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

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APPENDIX B

[Date]
[Name]
[Address]
[City, State, Zip]

Dear Forensic Section Member:

IARP is pleased to cosponsor a research study of advanced forensic practice in cooperation with The Ohio State University (OSU). The Forensic Section has authorized the use of its membership roster from which OSU will select participants. There is little research about the practices used by forensic rehabilitation professionals. Your willingness to provide accurate information will increase the understanding of forensic methods. This study has been approved by the human subjects committee at OSU.

You have been randomly selected to participate. Soon Larry Kontosh of OSU will be calling you as part of a telephone survey because of the advanced nature of your practice and your membership in the Forensic Section.

You are being notified in advance of the phone call because we have found that busy professionals appreciate being advised that a research project is being conducted and that they will be called to participate. Enclosed herein is a postcard you should return indicating your desire to participate in the study and when it is convenient to contact you.

The execution of the survey will be done by interview over the phone. The first time you are called you can take the 20 minutes then to do the survey or schedule a time to be called back. The questionnaire will ask you about how you do Transferable Skill Analysis. The questions will relate to your methods and practice of TSA. Some of the answers may require you to do some preparation. Because of the nature of the statistical analysis used in the study, actual numbers of cases worked in 1998 in certain categories are critical to the outcome of the study. Your
willingness to reflect on and review data for cases processed in 1998 will be very helpful.

Because of your advanced skill, your participation in this survey is valuable to the profession and to future research. However, your participation is voluntary. You may refuse to participate.

Further the information gathered will be kept confidential. Your involvement in the survey, as well as, the data you provide will be used only for research. No tracking numbers will be assigned to the survey instrument so, even inadvertently, data once recorded will not be able to be linked to participants.

In appreciation for your participation in this research project, a summary of the findings of the study can be sent to you by email or U. S. Mail. Your cooperation in this survey is vary much appreciated. If you have any questions, please contact Larry Kontosh at 800/680-8445 or principal researcher Joe Wheaton 614/292-8313.

Sincerely,

Rob Teplansky
IARP

Larry Kontosh
The Ohio State University
REFERENCES


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Social Security Administration. (1978b). Rules for adjudicating disability claims in which vocational factors must be considered. In Federal Register, Vol. 43: 45. Washington, DC.


