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Future Work Propensity: A Proposed Alternative to Purely Statistical Models of Worklife Expectancy

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The authors propose an alternative to purely statistical models of work-life expectancy. The concept of Future Work Propensity is introduced as a method that combines quantitative and qualitative data analysis methods to arrive at a "range of reality" with respect to future work participation. Literature support is provided with respect to hybrid methods to enhance opinion validity through the application of clinical judgment. Twelve domains of data are proposed that are theorized within an economic supply and demand model.

Background

The concept of worklife expectancy is best described as the duration of time a person will spend either working or looking for work over the remainder of his or her life (Foster & Skoog, 2004). People who either are working or looking for work are said to be participating in the labor force (Bureau of Labor Statistics, 2008). The authors sometime see experts and litigators attempting to draw a parallel line between the concept of worklife expectancy and one's statistical life expectancy. A person's life span is measured by two discreet events-birth and death. Because of this certainty in measurement, statistical life expectancy tables provide a framework for reliable statistical projections of one life expectancy. Conversely, determining whether a person is working or looking for work is not so clearly defined or easily measured. Workers may:

- hold multiple jobs or work significant amounts of overtime;
- work in a family owned business on an unpaid basis;
- voluntarily or involuntarily limit their participation to part time work for economic or non-economic reasons;
- be marginally attached to the labor force due to futility of job search efforts or discouragement (Bureau of Labor Statistics, 2010).

A person's participation in the labor force is even less clear when there is disability involvement. Disability may interact or interfere with the person's ongoing participation in the labor market causing periods of interruption or inactivity. A 2010 report from the Bureau of Labor Statistics (BLS) clearly shows a strong relationship between persons with a disability and his or her participation in the labor force (2010). Highlights from this report indicate:

For all ages, the employment-population ratio was much lower for persons with a disability that for those with no disability;

- the unemployment rate of persons with a disability was well above the rate of those with no disability;
- persons with a disability were over three times as likely as those with no disability to be age 65 or over;
- nearly one-third of workers with a disability were employed part time, compared with about one-fifth of those with no disability (p. 1), (Bureau of Labor Statistics, 2010).

The most conventional method of projecting when a person is likely to exit the labor market is to simply use the age at which he or she will reach their social security or employer sponsored retirement age. For social security, this depends on the person's birth year and ranges between 65 and 67 years old. Employer sponsored programs vary, but are usually tied to a combination of years of service and one's age. The limitation with this method is that workers may voluntarily elect or be involuntarily forced to remove themselves from the labor market prior to this date for any number of reasons.

As shown from the BLS statistics, a person's ability to participate in the labor market can be complicated by disability related issues. These issues may cause a person to experience periods of intermittent or decreased work availability over his or her worklife. This will serve to moderate his or her ability to participate in the labor market on a full time basis or to full retirement age. As an example, a person may be medically limited to part time work of 4 hours per day, while their historical participation was 8 hours per day. In this case, the employee continues to participate in the labor market, albeit at only 50% of their pre-disability participation rate, thus resulting in a 50% reduction of work availability over their remaining worklife. This issue is even less clear in cases where a worker continues to work full time, but is projected to experience a reduction in work participation either intermittently or prospectively over their remaining worklife, as a result of permanent impairment.

Statistical Models of Worklife Expectancy

The earliest worklife tables were published by the BLS (Smith, 1982) with the last published in 1986 (Smith, 1986). Since the last BLS tables were published in 1986 (Smith, 1986), several privately constructed tables (Gamboa & Gibson, 2006; Krueger, Skoog & Ciecka, 2006; Skoog & Ciecka, 2001a; Skoog & Ciecka, 2001b) have been published. A detailed analysis of the various worklife expectancy models is beyond the scope of this paper. Instead, a general overview of the most commonly referenced tables is provided. For a detailed analysis and critiques of the models, the reader is referred to Ciecka, Rodgers & Skoog (2002); Field & Jayne (2008); Gamboa & Gibson (2006); Hale (2001); Ireland (2009a); Ireland (2009b); Jones (2005); Jones (2006); Krueger, Skoog & Ciecka (2006); Gamboa & Gibson (2006); Skoog & Ciecka (2001a); Skoog & Ciecka (2001b); Skoog & Toppino (1999); Skoog & Toppino (2002).

Bureau of Labor Statistics Tables

The earliest tables utilized the Markov Increment-Decrement model with data collected from the Current Population Survey (CPS) (Smith, 1982). Smith (1983) described the Increment-Decrement model as one that accounts for the explicit movement into and out of the labor market. In other words, the increment-decrement model utilizes a flow variable to predict transition probabilities rather than participation levels (Smith, 1983).

Privately Published Markov Increment-Decrement Tables

The Skoog & Ciecka (2001) & Krueger, Skoog & Ciecka (2006) tables both utilize the same Markov increment-decrement model first introduced by the Department of Labor in 1982. These tables represent a refinement and updating of the original BLS tables. The underlying assumption in the Markov model is that "the numbers [of people] who remain active or inactive and those who enter and exit the labor force reflect the probabilities of making those transitions [entering and exiting the labor force]" (p. 168) (Foster and Skoog, 2004). Applying this assumption to the labor market means that the probability of a given cohort being active in the subsequent year depends only on whether he or she was active or inactive in the labor market during the current year (Foster & Skoog, 2004). The Markov model acknowledges the infinite number of individual variables that can influence a person's active or inactive work state. However, because the multitude of variables are not known and thus cannot be statistically controlled for, they are treated as random variables in the Markov model (Foster & Skoog, 2004). The Markov model assumes that each subject in the CPS data is reasonably representative of the entire sample, thus satisfying the assumption of homogeneity. While individuals may vary by health, occupation, work motivation or any number of other variables such as disability, in the Markov model they are all treated as random. Cohort variables in the Markov model include age, gender, education and race (Foster and Skoog, 2004). Since disability status as it relates to work is not a known variable, it may not be appropriate to utilize the Markov model to estimate the statistical worklife expectancy of a person with a disability. Doing so may violate the assumption of homogeneity of an individual within the overall sample data.

Privately Published Life-Participation-Employment (LPE) Tables

The Gamboa & Gibson Tables (2006) utilize an alternative LPE Model to estimate worklife expectancy. The LPE model utilizes government statistics on life expectancy (L); actual effort to participate in the workforce (P); and the probability a person is both alive and employed during a given year in the future (E). Unlike the early BLS worklife tables (Smith, 1982; Smith, 1986) or the later Skoog and Ceicka (Skoog & Ciecka, 2001a; Skoog & Ciecka, 2001b)

tables, the Gamboa and Gibson tables provide estimates of reduced worklife using disability measures from the CPS and the American Community Survey (ACS) as independent variables.

Worklife Table Limitations

The key to understanding the limitation in applying either of these tables to persons with a disability comes from first understanding the source and meaning of the underlying data from which the tables are constructed. Both sets of tables are vulnerable to the same limitation regarding the ability to generalize worklife estimates to people with disabilities and their resultant participation in the labor market (Ireland, 2009b). Field (2008) opined that all of the statistical work tables "fail to distinguish adequately between types and levels of disabilities" (p.13). Disability related questions in both the CPS and the ACS where not designed to measure disability within a work context, but instead to screen people for health, illness or sickness related conditions (Ireland, 2009b). Therefore, any attempt to make the leap between the presence of impairment, injury or illness and any resultant statistical impact on work participation is seriously flawed and lacks a reliable and valid foundation.

By using large sample statistical calculations as the sole source of worklife estimates, full weight of opinion is being placed on large homogenous statistical samples rather than an individual with a unique set of circumstances that will impact his or her future work participation. It is incumbent upon the forensic rehabilitation consultant to consider all factors that may impact a person's future work participation when trying to arrive at conclusions of reduced participation (Field, 2008). Field and Jayne (2008) reported "the worklife expectancy tables might more appropriately be used to estimate a worklife expectancy, but then be adjusted to estimate the consequence of a disabling condition through professional clinical judgment" (p. 83).

Work Propensity Theory

The concept of future work propensity was first introduced in 2008 (Spruance, Robinson & McKay) as an alternative methodology to the controversial worklife expectancy tables. Future work propensity is best viewed as an educative adjunct to statistical approaches to worklife expectancy that a jury may more easily understand. Instead of predicting a person's future work participation based solely upon statistical models, it uses both qualitative and quantitative data to present a "range of reality" (Spruance, Robinson, & McKay, 2008). Utilizing both qualitative and quantitative data sources allows an expert to describe how various factors interact and influence an individual (Barros-Bailey & Neulicht, 2005). Barros-Bailey & Neulicht (2005) referred to this hybrid method of integrating qualitative and quantitative data in rehabilitation case conceptualization as "opinion validity" (p. 34).

In conceptualizing the importance of a hybrid assessment approach, Barros-Bailey & Neulicht (2005) stated "while quantitative research limits itself to what can be measured or quantified and qualitative research attempts to pick up the pieces of the unquantifiable, personal, in depth descriptive, and social aspects of the world to gain a holistic, insider's perspective, [where] the researcher is not divorced from the process" (p. 40). To make the transition from purely quantitative approaches to one that combines both quantitative and qualitative data, requires the application of clinical judgment that is generally learned through one's training, skills and experience. Choppa et al. (2004) wrote on the need for one's clinical judgment to be predicated upon an evidence-based scientific foundation as is practical. Choppa et al. (2004) described a model for the application of clinical judgment that "incorporates such activities as direct observation, diagnosis (vocational evaluation and assessment), dispassionate (objective) and analytical observations, discerning and comparing (evaluating and synthesizing varieties of information), in order to assert a proposition (opinion) about the client" (p. 135). Both processes described by Barros-Bailey & Neulicht (2005) and Choppa et al. (2004) illustrate the importance of integrating data from multiple sources to arrive at rehabilitation conclusions that are valid, reliable and would stand the test of legal scrutiny.

Evaluating one's future work propensity may incorporate statistical data sources, but relies most heavily on the expert's clinical judgment and experience to interpret evaluee specific data. Future work propensity evaluation is not a "cookbook" method of statistics, but instead requires expert clinical judgment and interpretation of the prospective interaction between the person (evaluee) and the labor market.

Our experience in working with people with permanent impairment has taught us that statistics alone are insufficient to predict an individual's ability to work in the future. We recognize there are many individual factors that are more predictive of future work propensity than any large group statistical table. There are many individual factors that weigh

heavily on the impaired individual's ability and probability of performing work in the future.

Proposed Data Domains

The authors propose 12 domains of variables in evaluating a person's future work propensity (Spruance, Robinson, & Pomeranz, 2010). These domains were identified through brainstorming of the author's personal caseloads and historical experience. These domains have strong face validity with respect to having an effect on a person's ongoing participation in the labor market following onset of impairment. Table 1 details the proposed domains.

The twelve domains are further categorized within an economic supply and demand model. Economic supply and demand will determine the market conditions under which workers are hired, retained and promoted. Based upon supply and demand factors, the market will define the necessary skill set for a worker to obtain jobs in their chosen profession. Supply side factors are presented to an employer by an employee in consideration for employment. This includes variables such as an individual's functional capacity; vocational capacity and worker preferences (Horner & Slesnick, 1999). Demand side factors are external to the individual being evaluated and are a function of the number of jobs available with employers at a given wage rate and for a specific vocational capacity profile (Horner & Slesnick, 1999). Demand side factors include considerations such local demographics and geography for a particular labor market; the unemployment rate and the availability or supply of workers matching the needed vocational profile. Within an ideal free market economy, competitive employment results when a "fit" is realized between the demand for a certain vocational profile (employer) and the supply of the needed labor (employee). It is the interaction of these two economic forces upon the 12 proposed work propensity domains that theoretically will determine the duration of time a person will remain active and participating in the labor market. (See figure 1.)

Conclusions

The authors propose that it is not only appropriate but necessary to look beyond the statistical data sources of worklife expectancy. A commonsense hybrid approach that presents a "range of reality" rather than a statistical conclusion is recommended. Estimating a person's future work participation cannot be viewed as a "cookbook" method, but must instead consider the complex interaction of known future work propensity factors.

The evaluation of future work propensity requires considerable clinical judgment since it requires interpretation and application of both quantitative and qualitative data. This hybrid approach seeks to understand a person within his or her own world view and environment. The future work propensity model may be applied as a stand alone methodology or as an adjunct to statistical models of worklife expectancy. Where future work propensity differs from statistical models is in the models ability to conceptualize an individual within their natural environment rather than as part of a homogenous population sample.

Table 1

Proposed Domains

Data Domain	Market Force
Geography	Demand Side
Economic Trends	Demand Side
Labor Force Trends	Demand Side
Person Specific (age, education, etc.)	Supply Side
Domestic Responsibilities	Supply Side
Historical Work Participation	Supply Side
Secondary Gain	Supply Side
Voluntarily Separation or Inactivity	Supply Side
Future Routine Medical Care	Supply Side
Future Aggressive Medical Care	Supply Side
Future Training / Rehabilitation Services	Supply Side
Progression of Medical Condition / Disability Course	Supply Side

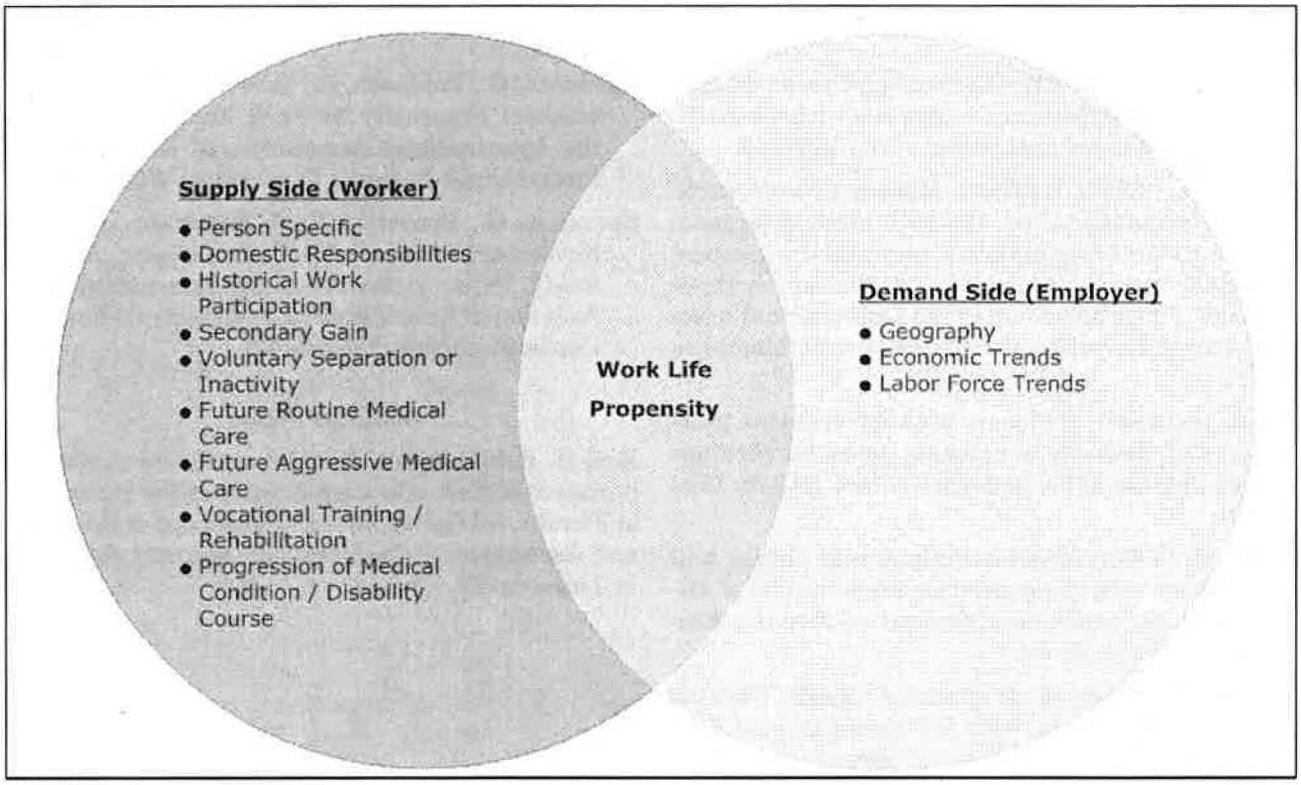

Figure 1. Proposed Future Work Propensity Model

Research to evaluate the efficacy of the future work propensity concept is underway (Spruance, Robinson, & Pomeranz, 2010). If initial pilot research supports the model, additional research is being planned to empirically validate the model constructs and methodological application.

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