Job Analysis in Occupational Therapy: Stepping Into the Complex World of Business and Industry

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Job analysis is used in a variety of fields to identify the nature of work performed. Occupational therapists use job analysis as a basis for evaluating injured workers, planning rehabilitative programs, structuring preemployment screening protocols, developing transitional work plans, and conducting environmental modification and risk management programs. There is little evidence in the literature of a theoretical basis or practical framework for job analysis in occupational therapy, although the theory that underlies occupational therapy provides a general foundation. Current job analysis methods appear inadequate for the wide range of practice applications and for responding to the changing nature of the labor market. A need is identified for further investigation of methods derived from occupational therapy and other disciplines, development of documentation approaches suited to a variety of job types, and attention to validity and reliability of results.

Occupational therapists use job analysis in a variety of areas of practice, ranging from industrial rehabilitation to mental health services. As one of the essential components of human performance (i.e., work, play, leisure), the area of work performance falls clearly within the occupational therapist's domain. Job analysis is frequently used to explore in detail the nature of work, whether it be assisting clients with cognitive or emotional disabilities to move into transitional work roles or assisting clients with physical disabilities to determine means for overcoming environmental barriers. Occupational therapists who specialize in injured worker rehabilitation or work adjustment training frequently use job analysis as a basic tool for determining treatment goals (Canelón, 1995), for developing work-hardening programs (Kornblau, 1989; Ogden-Niemeyer & Jacobs, 1989), for structuring preemployment screening protocols (Miller, 1996), and for evaluating the need for workplace and task modification (Aja, 1996; Jacobs & Wyrick, 1989; King, Gratz, Scheuer, & Claffey, 1996; Miller, 1996; Ogden-Niemeyer & Jacobs, 1989).

Despite educational foundations in task analysis and a professional concern with the area of occupational performance, occupational therapists may find themselves ill equipped to understand the complexities of jobs in many industries, to communicate with employers and human resource personnel about the nature of jobs, to document information meaningfully and comprehensively, and to ensure the validity of information gathered. Little guidance is provided in the occupational therapy literature with regard to job analysis, despite the complexity of the procedure and the wide diversity of contexts in which it may be applied. Most of the occupational therapy publications on work rehabilitation or ergonomic analysis give brief overviews of job analysis, with limited attention to methods. A vast body of information relative to this practice exists in the literature of industrial and organizational psychology, industrial engineering, and kinesiology but is rarely referenced in the occupational therapy literature. These alternative sources may provide the therapist with tools that are relevant to the purpose and context of the job analysis at hand.

In this article, I discuss job analysis as it is used in occupational therapy and other disciplines and examine potentials for improvement of occupational therapy's job analysis procedures through consideration of techniques used in other fields and new developments in the U.S. Department of Employment Service's job description taxonomy. I also highlight future directions for job analysis on the basis of the changing needs of industry and the demands of clinical practice.
Theoretical Foundations

Writers in most fields view job analysis as an analytical process designed to collect data about jobs. Opinions vary, however, about the theoretical purposes for job analysis and the process to be used. Ghorpade (1988) described jobs as being composed of several components in an input-output system. The input consists of organizational and worker components. The organizational aspects include the machines, tools, materials, and guidelines used to complete the job, whereas the worker components are the knowledge, skills, and abilities necessary to perform work tasks. The throughput consists of the task behaviors that transform the input into the desired output of the job. The output is the services and products that result. In Ghorpade’s view, job analysis involves examining each component in order to gain an understanding of the process as a whole. Others have suggested that a larger, integrated view of organizational functioning is necessary when analyzing jobs, but they have agreed that breakdown of jobs, either by knowledge, skills, and abilities; by behaviors; or by worker accountability, is a necessary feature of the job analysis process (Dufetel, 1991; Ferkerish & Hayden, 1993; Heneman & Heneman, 1994; Hupp, 1995).

Harvey (1991) described three essential aspects of job analysis: (a) description of observable activities or end-products; (b) generation of results that are verifiable and replicable; and (c) identification of required work behaviors independent of the incumbent employee’s skills and traits. Although the isolation of job requirements from worker performance is common in job analysis practice, this separation may be artificial because the nature of a job changes on the basis of the skills and interests of the worker who performs the job and the organization’s needs at that particular time (Dufetel, 1991). This view is supported by Campion’s (1989) finding that jobs with certain design features have unique ability requirements but that not all successful employees have these abilities. Others have agreed with the need to focus on critical work tasks and outcomes in defining jobs (Denis & Austin, 1992; Dufetel, 1991).

There is limited evidence in the literature of validation studies with regard to job analysis methods partly because of the difficulties involved in conducting these studies (Harvey, 1991). Validation is complicated by the changeable nature of many jobs, the varying influences of organizational climate, and problems with obtaining unbiased observations (Fleishman & Mumford, 1991). Some pencil-and-paper checklists used in business contexts have been subjected to reliability testing (Harvey, 1991), but there is no evidence of this having been done for job analysis recording in occupational therapy.

A number of approaches to job analysis have arisen from the various disciplines that use this technique. Campion (1989) identified four approaches to job design, a related task that also considers the elemental composition of jobs. Each approach arises from a different field of inquiry:

1. The motivational approach, which is derived from organizational psychology and theories of work motivation, is largely concerned with such outcomes as job performance, job satisfaction, and intrinsic motivation. It looks at a complex range of job components, including mental abilities.

2. The mechanistic approach, which is derived from industrial engineering, is oriented toward human efficiency models. Such activities as time-and-motion studies and work simplification are associated with this approach. In contrast to the motivational approach, the mechanistic approach focuses on redesigning jobs to reduce the mental demands of the work.

3. The biological approach arises from the disciplines of biomechanics, ergonomics, work physiology, and anthropometry. The goals of this approach are to minimize physical stress and endurance through reducing strength and load requirements and to reduce environmental stressors, such as noise and temperature extremes.

4. The perceptual-motor approach is concerned with the attentional and concentrational requirements of jobs and has been derived primarily from research on human factors engineering and information processing. The outcome goals of this approach are matching human mental capacities with job requirements and enhancing performance through proper lighting and organization of workstations.

This overview of approaches to job design is instructive in its demonstration of how different purposes and theoretical orientations may affect our view of jobs and how we analyze them. Occupational therapists have applied a similar array of theoretical approaches to job analysis (Arwood & Michalek, 1992; Canelón, 1995; Farrell, 1992; Hamel & Symons, 1993; Roberts & Zimbrich, 1994).

Job Analysis in Occupational Therapy

Job analysis in occupational therapy is most often described in reference to industrial rehabilitation or work hardening (Aja, 1996; Jacobs & Wyrick, 1989; Kornblau, 1989; Ogden-Niemeyer & Jacobs, 1989); however, there are several examples of its use in planning treatment programs for other clients with physical disabilities for whom work reentry is a goal (Canelón, 1995; Hamel & Sy-
consistently and objectively identify the positions and contributions of industrial engineering approaches to more productive and efficient work roles. King et al. (1995) noted that job descriptions that are job analysis (King et al., 1995; Borman, Jeanneret, & Fleishman, 1995).

Although the purposes and analytical frameworks for job analysis in occupational therapy appear to span each theoretical approach described by Campion (1989), the literature does not describe specific procedures or techniques that may assist the novice therapist beyond listings of the possible approaches (i.e., interview, observation, video taping) and identification of specific work components (i.e., movements, repetitions, force, tools used) (Jacobs & Wyrick, 1989; Kornblau, 1989; Ogden-Niemeyer & Jacobs, 1989). Inventories or check lists can be used as guidelines in performing an analysis (e.g., Edwards, 1989), but these do not address the complex features and questions that arise when performing job analyses across settings or in complex work situations.

Job analysis documentation is frequently done through listing the physical demand characteristics of a job, which typically are described in terms of the classifications developed by the U.S. Training and Employment System (U.S. Department of Labor, Manpower Administration, 1972). This system has been used for analysis of jobs in the U.S. Dictionary of Occupations (DOT), the Canadian Classification and Dictionary of Occupations (CCDO), and a multitude of other job classification publications (as cited by Jacobs & Wyrick, 1989). The taxonomy includes physical demand requirements, cognitive-perceptual factors, psychosocial factors, environmental factors, and productivity demands (U.S. Department of Labor; Manpower Administration, 1972). However, Ogden-Niemeyer and Jacobs (1989) noted that the job descriptions that are based on this classification are insufficient in a work-hardening program where a practitioner should assess in detail the biomechanical and ergonomic features of a job. The U.S. Department of Labor itself has recognized the limitations of the current approach and is preparing to release a new taxonomy for describing factors associated with jobs in its revision to the DOT, the Occupational Information Network (O*NET) (as cited by Peterson, Mumford, Borman, Jeanneret, & Fleishman, 1995).

Some other approaches to job analysis cited in the occupational therapy literature include a modified demands approach (Atwood & Michalek, 1992; Miller, 1996), a descriptive approach (Candón, 1995), ergonomic job analysis (King et al., 1996), and task analysis (Hamel & Symons, 1993). Farrell (1993) advocated the potential contribution of industrial engineering approaches to more consistently and objectively identify the positions and actions required to perform jobs. She described the use of predetermined motion-time studies (PMTS), a sequential listing of worker movements, to provide complete and consistent identification of actions and time standards for jobs. She noted the benefits of using simplified and unambiguous language to describe job requirements and of using standards for workers without disabilities as benchmarks for required functions. Miller (1996) outlined the contributions of a "functional job description" (p. 49), which identifies essential job functions and describes jobs in functional terms, including detailed description of physical demands. Both functional job descriptions and PMTS require thorough, systematic detailing of work functions and assume that the therapist has a firm grounding in work performance analysis and in how to differentiate essential from nonessential duties of the worker.

Issues and Concerns Related to Job Analysis

Job analysis has been widely used in business organizations, serving as a basis for job design, human resource planning, recruitment and selection, performance appraisal, compensation, training, and legal protection (Ghorpade, 1988). The most compelling reasons for doing job analyses in industry in the 1990s lies in the legal ramifications of not doing job analyses. Although they are not a legal requirement of organizations under the Americans With Disabilities Act (ADA) of 1990 (Public Law 101-336), job analyses are useful from a defensive perspective if a firm is charged with discrimination or disparate impact of a screening or promotion procedure (Karsten, Schroeder, & Surerre, 1995). Under ADA, it is important to identify the essential functions required to produce the outcomes associated with the job (Heneman & Heneman, 1994). The analysis must specify the job's physical, environmental, and communication demands (Karsten et al., 1995).

Others in the field of organizational development have questioned the utility of job analysis, with a growing trend toward using work teams, where many jobs become a function of several workers rather than of one and require expanded, overlapping work responsibilities (Challenger, 1993; Lawler & Jenkins, 1991). When work is assigned to teams rather than to individuals, the responsibility for specific work functions shifts among team members in response to external demands and internal activity (i.e., absences, avoidance of monotony or repetitive motions) (Lawler & Jenkins, 1991). Some have argued that job analysis unnecessarily restricts organizational flexibility in development and that defining jobs may reinforce the status quo (e.g., Dufeyl, 1991).

The merits and diverse applications of job analysis in occupational therapy are evidenced by its widespread use across many areas of practice. A number of concerns arise with respect to the adequacy of present methods that occupational therapists use to serve the multitude of identified needs in practice. Specifically, the issues dis-
cussed in the following sections are of concern when the state of the art is considered.

Utility of Classification Systems

In determining the physical demand requirements of jobs, the U.S. Training and Employment System remains in wide use as a means of summarizing the strength and physical performance requirements of work. This framework includes a physical requirements classification method that describes standing, walking, sitting, lifting, carrying, pushing, and pulling (U.S. Department of Labor, Manpower Administration, 1972). The system for classifying strength demands is a gross measure that assigns a strength level to a person on the basis of prescribed lifting categories (i.e., a person in a “medium” strength range job must lift or handle 50 lb on an “occasional” basis and 20 lb on a “frequent” basis). The meaning of analyses that are based on this system is highly subject to personal interpretation, given the changing nature of most jobs and the problems inherent in simplifying human performance to this degree. A therapist may have trouble classifying a job that changes from day to day or throughout the day. For example, would a truck driver who performs 2 hours of constant lifting and handling when making a delivery, but who sits in a truck for up to 80% of his day, be classified as performing constant lifting or occasional lifting? What if the load varies from day to day? Should the classification be made on the basis of anticipated maximums or on the “usual” load handled? The distinction is important if treatment and return-to-work programming are to be based on the analysis.

This classification system does not address the issue of repetitive motions, an area of concern because of the high incidence of cumulative trauma disorders. A standard classification system would be advantageous to allow comparison of job requirements across industries (which is one reason why the U.S. Training and Employment System was developed); however, this is impractical in many job situations. It may be necessary to abandon the practice of applying a single physical demand description to each job and to instead classify the varying or differing components of a job separately (Harris & McMaster, 1995). To the extent that identification of a multilevel classification system is possible, even within job categories, it may be a desirable end-goal of research.

A further concern is the lack of specificity of the physical demands analysis. A worker’s strength requirements are typically described in terms of amount of weight to be lifted or carried. Human movement is more complex than this, and the requirements to perform seemingly simple tasks may involve a combination of movements through a variety of planes. For example, Fleishman’s Ability Requirements Scale, an assessment framework that is based on behaviorally anchored ratings of 52 sensory, physical, psychomotor, and social abilities, includes a scale for recording a broad range of performance requirements (Fleishman & Mumford, 1991). This physical ability scale considers static strength, dynamic strength, explosive strength, extent and dynamic flexibility, trunk strength, gross body coordination, and equilibrium among other functional means of describing required performance. The scale has been subjected to extensive evaluation of internal and external validity (Fleishman & Mumford, 1991) and will be adopted as part of the O*NET classification system for jobs (Peterson et al., 1995). The Fine-Detailed Work and Action Posture code described by Farrell (1992) provides a system for recording in detail the nature of movement patterns (i.e., guarded or free, loose or fixed), describing work materials, and indicating planes and directions of movement required for work. Approaches such as these may provide occupational therapists with tools to conduct more highly descriptive job analyses that provide a defined focus for treatment interventions.

Inadequacy of Methods

Although a variety of data collection methods, from interview to observation, and review of DOT or CCDO specifications are used in compiling a job analysis, the use of a single method to analyze widely ranging job types is problematic. Job analysis through conventional methods of observation is difficult with jobs that are less physical in nature. As the U.S. Department of Labor (1982) has noted, clerical, managerial, technical, and professional jobs are difficult to classify because their work activities are less observable, occur over an extended period, are composed of a variety of responsibilities, and are generally less standardized than other jobs. For example, in attempting to describe a legal assistant’s work, one might observe the daily performance of an incumbent employee in this field and determine the physical demands to be in the light range, with physical requirements of occasional lifting of large books and paper files, extended periods of sitting in a stooped posture, the need to frequently turn pages in legal books, and frequent typing on a computer keyboard. Review of documents may indicate the job’s educational requirements from which an inference can be drawn about the cognitive demands. Interview may disclose the incumbent employee’s need to respond to deadlines and his or her frequent frustration with attempting to locate information of a tedious nature (i.e., subjective data that may change from worker to worker). Nowhere do these methods capture the many cognitive-perceptual functions, social skills, critical judgment, and flexibility required for the job. Although extensive interview with
several workers may reveal much of these data, the process is tedious and time consuming. In this situation, it may be appropriate to use questionnaires that yield information about duration or percentage of time spent on various aspects of work, critical incidents, or identification of the end-products of work (e.g., reports produced, number of cases prepared).

Reliability and Validity of Methods
Although detailed skill inventories and functional descriptions may overcome some of the accuracy problems associated with job analysis, a succinct, consistent, and readable method of documentation that can be interpreted by another therapist or professional in the workplace still needs to be developed. At present, documentation among therapists is not consistent because of the lack of a model(s) for data collection and recording that is comprehensive and adaptable to different job types (Harris & McMaster, 1995). The validity of job analysis data is difficult to discern, but one may assume that the information gathered is only as valid as the time allotted to the process, the practitioner's skills, and the amenability of the job being analyzed to categorization. It is probable that different observations and reports would emerge from each therapist who conducted the analysis. This concern with incomplete or inaccurate data arises especially when the job analysis is to serve as the basis of rehabilitative programming or as a metric for determining readiness for return to work.

Responsiveness to Labor Market Trends
As previously noted, there is a trend in the labor market toward use of work teams. In a teamed environment, should the essential functions of a single worker be defined by the aggregate responsibilities of the team or as core requirements for all workers, with many functions seen as nonessential for individuals because they can be performed by any member of the team? The job analyst will be required to both understand the complexities of organizational functioning and advise employers of their responsibilities under human rights legislation to accommodate the needs of workers with disabilities. New approaches that analyze work in terms of individual contributions to a team or that focus on work output will be increasingly necessary.

Lack of Skills and Experience
A final concern is that many therapists do not possess the tools and knowledge to perform a comprehensive analysis of a job that is complex in nature. As with any area of practice, occupational therapists, especially those who specialize in work programming, may be able to apply their knowledge of biomechanical and psychosocial functioning to job analysis. However, many therapists who have limited understanding of the organizational and technical environment where the work tasks are performed and who lack the tools and documentation strategies to collect wide-ranging types of data for a variety of purposes may find job analysis difficult. Although occupational therapists excel in activity analysis and accommodation of disability, it seems that middle-class, university-trained therapists often lack previous exposure to many work settings and functions and have limited understanding of the industrial or corporate culture. Further knowledge about job analysis must be obtained through additional training, self-study, or work specialization in such areas as ergonomics, kinesiology, or industrial rehabilitation.

Future Directions
The application of task analysis to job settings is complicated by the wide variety of job situations encountered in industrial therapy and in other areas of practice where job entry and work-site modification are part of the comprehensive intervention for workers with disabilities. A much larger "tool bag" for job analysis may be helpful to occupational therapists in dealing with different work situations and client needs. Multiple methods of data collection, with such frameworks as structured task questionnaires with known reliabilities, critical incident techniques, industrial engineering methods, and ergonomic analysis formats, may be appropriate, depending on the nature of the job and the work environment. Methods of effectively recording strength, exertional, and positional demands for various physically oriented jobs should be examined to improve the validity of the physical demand requirements. The recently released O*NET prototype focuses attention on what will undoubtedly become a widely used classification and analysis system.

Development of more consistent procedures for recording job analysis information may allow for development of detailed information databases for jobs, which therapists could access in order to reduce repeated analysis of similar job functions across departments or organizations. Although it is important to look at each job related to a specific client to determine whether unique features exist, there are many aspects of certain jobs that are predictable. Job analysis is a time-consuming and laborious process. Repeated reviews of similar jobs, while instructive for the therapist, may not be the most efficient use of resources. The present diversity of documentation approaches often makes information sharing difficult, even among occupational therapists.

Job analysis as a tool for employer compliance with the ADA and other human rights legislation may become
more important as legal challenges to employer practices, such as preemployment screening or failure to hire or rehire workers with disabilities, occur. Job analyses performed for this purpose should be results oriented and should address critical job functions (Heneman & Heneman, 1994; Miller, 1996). This orientation allows all parties to identify potential modifications to jobs by focusing on what needs to be done on a job rather than on how.

Above all, more attention to the validity and reliability of data gathering and recording procedures is needed in order to assure fair and professional reporting of job information. This will increasingly be a concern as job analysis data are called to assist in legal determinations related to reasonable accommodation and denial of employment or reemployment for workers with disabilities.

Conclusion

The language of the industrial market is one that is largely foreign to many occupational therapists but an essential one to learn if we are to communicate effectively (Taylor, 1993). There has been considerable attention paid to industry job classification systems, but the link between occupational therapy and business has remained weak partly because of the diversity of systems in actual practice and because of the lack of comprehensive, published approaches to job analysis in our field. Although occupational therapists are active in the area of job analysis as it relates to integration of workers with disabilities into work settings, there appears to be no systematic framework for conducting or documenting job analysis. Task analysis skills have been applied to job analysis for functional purposes, but this method does not provide a holistic framework for consideration of the many physical, cognitive, affective, and cultural areas of work performance that cannot be observed. Further, given that occupational therapists have a variety of uses for job analysis, the lessons from other professions where multiple approaches to job analysis are used should be considered.

The changing nature of jobs and worker functions also demands consideration of new approaches to the job analysis process, especially given the tendency of occupational therapists to work closely with other professionals in industrial settings. Occupational therapists are currently underrepresented in the job analysis literature and have made few contributions to the development of this evaluation tool. The environment is ripe for occupational therapists, who have a grounding in performance from mental, physical, and psychosocial perspectives, to examine current practices and to take a leadership role in improving practices in industry related to workers with disabilities.

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References


