Module A
Industrial/Organizational Psychology

For Weiten’s

Psychology:
Themes and Variations
Briefer Version, Seventh Edition

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Throughout this book we have seen many examples of how psychology has been applied to practical problems in a wide variety of settings. But we have yet to discuss in earnest one setting that has received a great deal of attention from the earliest beginnings of psychology—the work setting. Industrial and organizational (I/O) psychology is the branch of psychology concerned with the application of psychological principles in the workplace. The Society for Industrial and Organizational Psychology (SIOP), the primary professional organization for I/O psychologists, encompasses approximately 6,000 members, which includes representation from all 50 states and 42 countries. The membership of the society has more than doubled in recent years, and this growth trend is expected to continue. As the economy in Western nations changes to emphasize service and information, the influence and importance of I/O psychology is likely to increase. As an area of specialization in psychology, I/O psychology is second only to clinical psychology in the number of practitioners. I/O psychologists are mostly found in four sectors of the economy: industry, universities, government, and consulting firms. As the pie chart shows, about three-quarters of I/O psychologists work in these settings. (Based on Society for Industrial and Organizational Psychology member database.)

**Overview of I/O Psychology**

Industrial and organizational psychology differs from other psychology subfields in the settings where it is practiced, in its content, and in its approach. It does not differ, however, in its reliance on the scientific method for its theories and research.

**Settings**

In one sense, I/O psychology is defined more clearly by where it happens than by what I/O psychologists actually do. I/O psychology is practiced in work settings, just as school psychology is practiced in educational settings. But even though the context in which research and application are carried out may be unique, I/O psychology makes use of the findings of many other branches of psychology. For instance, principles of human motivation are relevant to the study of productivity and safety behavior; theories of attitude formation help in understanding the job satisfaction of workers and organizational culture; the social psychology of groups helps us understand team performance and leadership dynamics; aspects of psychophysiology are relevant to a consideration of job stress, clinical theories of adjustment are applicable to the emotional consequences of job loss, and theories of intelligence are used to develop tests that might assist in hiring decisions. In fact, a good deal of the work of the I/O psychologist involves adapting or extending the basic principles of other specialty areas of psychology to the work setting.

With respect to how I/O psychologists practice their profession, they use most of the same techniques as their colleagues in other areas, such as developmental or social psychology. Like other psychologists, the I/O psychologist may do research in a laboratory or in a field setting (at the work site, for instance). I/O psychologists use the same basic experimental designs and statistical tests as other behavioral researchers, depend just as heavily on prior research for theoretical guidance, and publish the results of their research in scholarly journals. In other words, like their colleagues in other areas of psychology, I/O psychologists are scientists who depend on the scientific method to guide their work.

**Content**

More than anything else, the content of I/O psychology helps define it as a branch of psychology. As Figure M.2 shows, the I/O psychologist has three primary areas of interest: (1) personnel psychology, (2) organizational psychology, and (3) human factors (or human engineering) psychology. Although we will consider each of these areas in detail shortly, it might be helpful to briefly describe them here.

**Personnel psychology** deals with determining whether people have the knowledge, skills, abilities, and personality necessary to perform various types of work effectively. This subarea of I/O psychology is concerned with the broad topic of employment testing and with such related topics as job training, test validation, interviewing, and employment discrimination. Personnel psychologists see the job or work environment as the “given” and the population of individuals who might be workers as the vari-
able factor. Their goal is to find the workers who have the right attributes to fit the demands of the job.

**Industrial/organizational (I/O) psychology** is concerned with how people adapt emotionally and socially to working in complex human organizations. It focuses on work motivation, job satisfaction, leadership, organizational culture, teamwork, and related topics. From this perspective, the concern of the I/O psychologist is to understand the factors that contribute to the right emotional “fit” between people and their work. Eighty years ago, managers believed that money was the only work motivator. The modern I/O psychologist concentrates on making the job itself more interesting (in the jargon of the field, “enriching” the job), rather than getting workers to forget how boring the work actually is by paying them more. Other topics pursued by organizational psychologists are the relationships between work and nonwork (such as family life), the creation of cohesive workgroups within increasingly ethnically diverse workplaces, and the complexities of leadership in a dynamic workplace.

**Human factors (human engineering) psychology** examines the way in which work environments can be designed or modified to match the capabilities and limitations of human beings. From this perspective, the human being is the constant and the job or work environment is the variable in the behavior equation. The concept of the work environment is used broadly and includes the actual physical setting in which the work takes place, the tools and resources used in conducting the work (such as printing presses, cash registers, laptop computers, and other equipment), and the arrangement or design of the work tasks (including such things as the scheduling of work hours). Thus, the challenge to the human factors psychologist is to design or redesign a work environment so that it best fits the capabilities and allows for the limitations of the humans who will inhabit it. Unlike personnel psychology, in which the individual is being tested or selected to fit the job, human factors psychologists fit the work technology or environment to human capabilities in order to promote efficiency, effectiveness, and safety.

### A Systems Approach

The division of I/O psychology into three facets is somewhat misleading because it implies that these areas operate independently. In practice, that is seldom the case. In fact, the actual work, the people who do the work, and the work environment define a larger entity that might be labeled the “sociotechnical system.” Changes made in one part of the system usually affect other parts of the system.

Changing the design of a task so that it is more complex (a human factors activity) may have a substantial impact on the satisfaction that a worker derives from that task (an organizational topic) and who might do best at that task (a personnel psychology topic). As an example, consider the simple act of computerizing what had previously been a manual task. On the surface, this might be seen as a “human factor” change, since it is a modification of the tools of the job. But the new technology also changes other aspects of the work. A clerk may no longer need to go to the filing cabinet to insert or retrieve documents, as files can now be accessed electronically without moving from a desk. As a result, the clerk may become more isolated and lose opportunities for social interaction with other workers. In addition, the introduction of the computer changes the skill and ability mix necessary for success on the job. Unless the worker is capable of interacting effectively with the hardware and software of the computer system, he or she is likely to experience performance problems (and accompanying feelings of frustration). In addition to these changes, the performance of the worker might be more closely monitored. Key-strokes can be counted and an average per minute calculated, errors can be detected, and other measures of performance can be collected and used to reward or punish the worker. Finally, supervisors might interact with employees by sending messages via e-mail rather than by talking directly with them, losing a personal element. In short, computerizing a task is more complex and dynamic than it seems on the surface.

The fact that the three areas of I/O psychology are not mutually exclusive is both a burden and an opportunity for I/O psychologists. The burden lies in being sensitive to the impact that making a change in one part of this sociotechnical system has on other parts of the system. The opportunity lies in having several options for dealing with real-world problems. For example, if an organization is having a problem...
with accidents or productivity, an I/O psychologist might suggest redesigning the work environment to be safer or more efficient. Alternatively, the psychologist might design a motivational program to encourage workers to engage in safer or more productive work. Finally, the psychologist might suggest changing the methods used to select or train workers. Any or all of these methods might be effective in reducing accidents or improving productivity. In all likelihood, the most effective intervention would combine elements of all three approaches. In a personal sense, the practice of I/O psychology is exciting because there are so many different ways to approach the same work-related issue.

**A Brief History**

Although psychology as a science was born in the late 19th century, various specialty areas, including I/O psychology, came along somewhat later. Hugo Munsterberg, one of the earliest practitioners of I/O psychology, was an original founder of the American Psychological Association in 1892. By 1910, Munsterberg had written the first text in I/O psychology. The first Ph.D. granted in I/O psychology was in 1915. It was presented to Lilian Gilbreth by Brown University. In this section, we will examine the development of I/O psychology from a historical perspective.

**Personnel Psychology**

Personnel psychology was the first of the three I/O subfields to appear. The emergence of this subfield was the result of several forces, the foremost being psychology’s increased interest in measuring and recording individual differences. As we saw in Chapter 9, Sir Francis Galton attempted to provide support for his cousin Charles Darwin’s theory of evolution by showing that traits are inherited. Part of this demonstration involved the first efforts at psychological testing, including measurements of psychological abilities, such as memory and reaction time.

Mental tests were subsequently adopted by educational institutions to identify those children and young adults most likely to benefit from various forms of education. Alfred Binet developed his intelligence test to separate educable from uneducable children in the French primary school system. And Hugo Munsterberg developed tests for the selection of ships’ captains, telephone operators, and trolley drivers. All of these instances of testing occurred before 1909, the year that Freud first visited America.

When the United States entered World War I, intelligence testing was introduced as a method of identifying those recruits with the greatest likelihood of becoming successful officers as well as steering nonofficers into specialties for which they were best suited (Yerkes, 1921). The respectability acquired by psychological testing from this wartime application carried over into industry following the war, and modern personnel psychology emerged. By 1932 there were dozens of texts describing the goals and methods of personnel psychology (such as Burtt, 1929; Viteles, 1932). Similar pressures for mass testing exerted by World War II further enhanced the importance of personnel testing, which retains a prominent role in I/O psychology today. Following World War II, there was a growing interest in personality and interest testing, and these new types of tests were added to the typical test battery given to job applicants.

**Organizational Psychology**

The prevailing belief in the early part of the 20th century was that money was the only motivator in business and industry. This belief was formalized by the theory of Frederick W. Taylor (1911), variously known as “scientific management” or “Taylorism.”
Taylor believed that one need only identify the most efficient way to physically carry out a piece of work (lay a brick, shovel coal), pick a worker capable of the work and willing to follow orders without question, and pay that worker in proportion to production rate. At that time, the term “job satisfaction” was of little interest to employers. And “intelligence” among workers was to be avoided at all costs. Taylor preferred to apply his principles to workers “slightly dumber than an ox” (Taylor, 1911).

The Taylorists’ views were eventually undermined by some influential experiments conducted at a Western Electric facility near Chicago in 1930. This work was described by Elton Mayo, an Australian psychologist working in the management school of Harvard University (Roethlisberger & Dickson, 1939). The research team discovered that employees’ attitudes toward their supervisors and their company had substantial effects on productivity—effects that seemed to be independent of pay level or other working conditions, such as lighting or rest breaks. This was a revolutionary discovery because it implied that attitudes have direct effects on behavior. Previously, managers had believed that only physical or “real” stimuli, such as heat, light, and pay, affect behavior. The accuracy of Mayo’s conclusions has been called into question over the years (Landsberger, 1958; Landy, 1988). Nevertheless, at the time the results appeared, they caused an earthquake in the world of business management. A new paradigm was introduced to replace scientific management, and the human relations movement was launched. This movement proposed that many factors beyond pay level contribute to the satisfaction and productivity of workers and that these factors can be identified in the attitudes that workers hold toward various aspects of their work. The implication was that supervisors should be more sensitive to the feelings of workers as a way of improving productivity. The human relations movement gave birth to 60 years of interest in job satisfaction, work motivation, and leadership, areas of study that remain important today.

Human Factors Psychology

Research and application of modern human factors psychology began with World War II. Airplanes, ships, submarines, and weapons had undergone a radical transformation since World War I, resulting in greater attention to developing technical systems that could be used effectively by humans. Of particular concern was the fact that far more accidents involving aircraft occurred than had ever been experienced in World War I. This situation was due, in large part, to the fact that the military aircraft had become much more complex. In World War I, plane cockpits had a few primitive instruments indicating speed, altitude, and engine characteristics. Bombs were dropped by leaning out of the open cockpit and dropping a missile onto the target. In the two decades separating the wars, technology had advanced rapidly. The cockpit had become a dazzling array of gauges, controls, lights, and arrows. Worse yet, each type of airplane had a different configuration of controls and gauges. Bomber pilots were reaching for flap controls where they had been on the last plane they flew but accidentally activating landing gear and vice versa, resulting in fatal crashes. Human error, rather than equipment failure, seemed to play the major role in most such accidents. The simple standardization of the cockpits of the various airplanes drastically reduced these accidents. Gauges and controls were placed in the same spot in every aircraft, and unique knobs were assigned to various controls. Modern
human factors psychology was born out of this sort of need to design the best and safest combination of human and machine. Much of the complex equipment used today, particularly in high-technology arenas such as aviation, nuclear power, and computers, shows the influence of the human factors specialist.

In the next three sections of this appendix, we will consider each of the facets of I/O psychology in greater detail. Because of the breadth and complexity of I/O psychology, we will consider a representative sample of I/O issues rather than a comprehensive listing of those issues. In the final section, we will reconsider how the three facets of I/O psychology are bound tightly together in a sociotechnical system.

**Personnel Psychology**

Every three or four years, the New York City Police Department (NYPD) announces that it would like to hire new police officers. Over 50,000 people usually apply for the positions. About 2000 applicants will eventually be appointed to the Police Academy. How does the city decide which 2000 to appoint? By administering a series of tests that determine the mental and physical ability and emotional stability of the applicants. This is an example of personnel selection on its broadest scale.

Consider another example. A new mountain bike manufacturer decides to hire someone to design and maintain a website. The company has never had a website before. The company asks applicants to create a sample website, with the intent of hiring the person who develops the most attractive and effective site. This is an example of personnel selection on its narrowest scale.

An I/O psychologist working for either the NYPD or the mountain bike company would go about the development of the selection processes in the same general way. The first step is determining the most important duties of the job in question. The second step is to list the human attributes (skills, abilities, knowledge, experience, and personality characteristics) that will be necessary for successful completion of those important duties. The third step is to develop a way of assessing or measuring those attributes in applicants. The final task is to decide who will get job offers based on the results of those assessments. Let’s look at this process in closer detail.

**Job Analysis**

The first step of determining the most important duties of the job is accomplished through what is known as a job analysis. Job analysis is a method for breaking a job into its constituent parts. It is a way to identify the most important parts of the job description—the requirements that are of primary interest to the employer. To use the job of police officer as an example, it is true that police officers give directions to lost motorists and pedestrians, fill in their log books on a regular basis, and put fuel in their patrol cars during their work shifts. But these are not the central or defining responsibilities of the police officer. The central responsibilities include enforcing traffic safety regulations, responding to calls for help from citizens and fellow officers, and apprehending individuals suspected of breaking laws.

A job analysis is a way of separating the less important aspects of a job (such as telling tourists how to find the Statue of Liberty) from the central aspects (such as intervening in a mugging). Once the task of identifying the truly important aspects of the job has been accomplished, the next step is to determine the knowledge, skills, abilities, or other personal characteristics necessary for successful completion of those tasks. When these key attributes have been identified, an appropriate test can be selected or developed. For the police officer, these attributes include memory and reasoning, communication skills, conflict resolutions skills, empathy, and physical abilities such as coordination and strength, to mention just a few.

**Test Administration and Interviewing**

The next step in personnel selection is assessing whether job candidates have the attributes required for the job. Standardized tests are used extensively in this phase. Employers can purchase tests from commercial test publishers or can develop special tests to meet their own needs. For example, the NYPD has its own 100-item multiple-choice test of mental abilities and uses a commercially published test of personality in its selection of new police officers.

Once a suitable test has been found or developed, the next step is to administer it to candidates and decide which of them has the greatest probability of being successful on the job. To continue with the police example, on a particular Saturday, NYPD will use several hundred public high schools and several thousand test administrators and monitors to assess tens of thousands of candidates. In most instances of employee selection, the prediction is that the higher the test score, the greater the likelihood of job success. Of course, this approach is based on the assumption that the employment test has acceptable
reliability and validity. That is, the test must be a reasonably consistent measuring device, and there must be evidence that it really measures what it was designed to measure. As you might guess, employers are always looking for ways to improve their employee selection procedures. In recent years, personality testing has attracted increased interest as a means to enhance the hiring process. In part, this trend is the result of the popularity of the five-factor model of personality (see Chapter 12) as well as the appearance of standardized tests to measure the Big Five personality traits, such as the NEO Personality Inventory (Costa & McCrae, 1992).

Many organizations are beginning to consider the use of credit checks and integrity tests as part of the selection process. Integrity tests are standardized measures intended to predict respondents’ honesty. From the perspective of employers, these sources of data may help them understand who among their applicants is most reliable and trustworthy. However, as with any assessment used for personnel decisions, the data from these tests must be evaluated in regard to the extent to which they provide valid job-related performance information. Unfortunately, studies have raised many doubts about how well integrity tests predict employee theft, rule breaking, and other forms of dishonest behavior (Brown & Cothern, 2002; Horn, Nelson, & Brannick, 2004). Moreover, many prospective employees perceive credit checks and integrity tests to be intrusive, since they can reveal private information about the applicant. The role of an I/O psychologist in such situations is to weigh the needs of the organization against those of the applicant. Every effort must be made to collect data that are directly relevant to the job for which applicants are applying (Turner et al., 2001).

At some point, it is important for the personnel psychologist to verify that the tests developed to identify the best job candidates are successful in doing so. Using a psychological test to hire people is analogous to testing a hypothesis in research (see Chapter 2). In this case, the hypothesis is that people who score better on the test will perform better on the job than those who score poorly on the test (see Figure M.3). If reliable performance measures are available, a statistical analysis can be used to test this hypothesis precisely. Such an analysis involves computing the correlation between test scores and performance scores (such as supervisory ratings). If the result is a strong positive correlation (see Appendix B), this finding supports the “hypothesis” that underlies using the test. This process of demonstrating that a test is a reasonably accurate predictor of job performance is known as validation. Many other approaches can be used to demonstrate the validity of a test besides this correlational method, but all have the same goal—demonstrating that those who score better on the test will perform better on the job. To return to our police officer example, a validity study might consist of correlating test scores on the entrance examination with subsequent measures of police officer performance, including evaluations of supervisors as well as more objective indicators of

Many jobs, such as those of police officers, involve a diverse array of activities and responsibilities. Personnel psychologists engage in job analysis to determine which responsibilities are crucial to a specific job. These job analyses then influence the employee selection procedures that are developed.

Figure M.3
A hypothetical example of the relationship between tests and job performance. When a standardized test is used to select the most promising job candidates, the implicit hypothesis is that higher scores on the test will be associated with better performance on the job. The relationship won’t be perfect, but when employers collect data on the link between test scores and job performance, the findings should resemble the hypothetical data shown here. These data would yield a strong positive correlation between test performance and job performance, which is what employers always hope for. (Based on Jewell, 1998)
success, such as arrest-to-conviction ratios and response times to calls for assistance.

Although standardized mental ability and personality tests are commonly used in personnel selection, the most widely used device remains the interview. There are two types of interviews: unstructured and structured. Unstructured interviews consist of nonstandardized questions with no clear right or wrong answers and no method for assigning a score to an applicant. Although many employers rely heavily on this type of interview, research suggests that it is highly subjective and far from optimal. Structured interviews are more like standardized tests. The same questions or question types are asked of all candidates and are based on attributes or experiences necessary for success on the job in question; there are clear guidelines for judging the adequacy of answers, and the scores assigned to an applicant have known relationships to the attribute being measured. Structured interviews can be constructed to be reliable and valid (McDaniel et al., 1994). In addition, they hold the promise of supplying useful information not supplied by other forms of testing (about characteristics such as oral comprehension, listening skills, and motivation).

**Equal Employment Opportunity and Testing**

The final step in personnel selection is to decide which candidates will get job offers. It will come as no surprise to you that employment tests and hiring procedures are often the subject of debate and controversy: Mental ability tests have been variously portrayed as instruments of discrimination or as fair and objective ways to reduce discriminatory practices. The arguments often center on the differential test performance of white and minority applicants, whether the applications are for college, graduate school, police departments, or mountain bike companies. It is not uncommon for minority applicants, on average, to score more poorly on standardized tests than white applicants, on average. The same type of controversy has appeared with respect to differential test performance of men and women on physical ability tests, of older and younger individuals on mental ability and physical ability tests, and of applicants with and without disabilities on both mental and physical ability tests.

In the United States, the Equal Employment Opportunity Commission and the Department of Justice are responsible for ensuring that tests are fair to all applicants, regardless of race, religion, gender, age, or disability. This rather simple goal has led to a complex tangle of legal, administrative, and philosophical disputes—a tangle that has resulted not just from the need to demonstrate that a test is “fair” to all applicants but also from an attempt to correct inequities in past hiring practices. In the past, this correction often involved a requirement that hiring decisions conform to a certain numerical goal until an imbalance (such as too few women in a workforce) has been eliminated. Thus, the notion of “hiring quotas” was introduced. Although strict hiring quotas were made illegal by the Civil Rights Act of 1991, many companies still strive to increase the diversity of their workforce.

This situation has created a good deal of debate among representatives of the federal government, employers, and personnel psychologists. Much of this debate has centered on the validity of the tests used in hiring decisions. The debate often occurs in the context of legal suits brought against employers by unsuccessful applicants, who typically claim that the tests disproportionately favor majority applicants and work to the disadvantage of minority or female applicants (often referred to in legal jargon as “adverse impact”). As a result, the federal courts have become heavily involved in the evaluation of the technical merits of tests and have issued rulings regarding what can and cannot be done in making hiring decisions. It is unlikely that the basic debate will change in the next decade. Many unsuccessful job applicants will continue to believe that the tests used are unfair. Many employers and personnel psychologists will continue to believe that the tests are valid and that their use is warranted. In addition, many politicians will continue to use the issue to their advantage. The modern personnel psychologist needs to cut through the ideological and political smoke and continue to develop and administer good tests. By applying what they know, they can help applicants, employers, and society as a whole.

As an example, consider the way police entry testing used to be done and how it is practiced today. In the 1980s, applicants were selected solely on the basis of general intelligence. Although intelligence is valuable in police work, other attributes are also highly desirable, including physical abilities, communication skills, and personality characteristics. Today, applicants are given a battery of tests in which high scores on one attribute (such as communication skills) can compensate for less than stellar scores on another attribute (such as physical abilities). When hiring decisions are based on several important attributes, it is likely that ethnic minority applicants will
fare considerably better. I/O psychologists have been at the forefront of attempts to create selection systems that are fair to all applicants.

New Trends and Challenges
Other areas often addressed by the personnel psychologist include training and education and performance assessment of current employees. In recent years, the emphasis has shifted from the act of “training” someone to the development of a “learning” environment in which the employee seeks out job and career information and the employer provides user-friendly resources and environments to ensure effective learning. The challenge in performance assessment is to construct a system (usually a series of rating scales) that is easy to use, fair and unbiased, and capable of providing information to the employee for skill development.

Under normal conditions the process of conducting a job analysis and developing valid and fair selection instruments is a complicated and lengthy endeavor. However, at times demanding circumstances can create increased pressure to engage in this work in a rapid, expeditious manner. In fact, at times it is even a matter of national security. After the terrorist attacks on the United States on September 11, 2001, the importance of personnel psychology took on new meaning. In response to these attacks, the Department of Homeland Security (DHS) was created and I/O psychologists who had previously worked in many separate agencies became part of a new team. A recent interview of I/O psychologists working in the DHS provided many details about their urgent, challenging, and crucial work (McFarland, 2005). Like other I/O psychologists, these individuals engage in personnel psychology research that is applied to the selection, development, and assessment of workers who need to be effective in their jobs. The federalization of airport screeners in 429 airports in the U.S. gave I/O psychologists working in the DHS only a few months to assess, select, and hire over 55,000 federal airport screeners. These psychologists accomplished this monumental task while executing their other responsibilities, which include engaging in ongoing evaluation and quality assurance, training development and deployment, organizational assessment surveys, and leadership development. An emerging responsibility for these psychologists is studying the DHS workforce’s response to the increasingly advanced technology that is used within the agency and ensuring that their selection systems, training programs, and work environments are revised to keep pace with these advances (McFarland, 2005). The mission-critical work of DHS psychologists provides another example of how each of the three branches of I/O psychology are intimately interrelated.

Organizational Psychology
Most people do not work alone. They work with colleagues, subordinates, and supervisors, often on project teams. As we saw earlier, organizational psychology is concerned with the human relations aspects of work. Organizational psychologists are interested in how organizational factors influence workers’ social and emotional functioning. In this section, we’ll discuss several topics that have been of special interest to organizational psychologists: work motivation, job satisfaction, teams, leadership, and organizational culture.

Work Motivation
Why do some people spend their free time in athletic activities while others choose to read books or go to concerts? Why do some people approach tasks enthusiastically while others are more passive or uninterested? Over the years, many theories have been proposed to account for these differences in motivation.

As you might expect, employers and I/O psychologists have a particular interest in motivational principles as they apply in the work setting. Why do some
employees accept the goals of the organization and their supervisor while others reject those goals? Why do some employees work hard while others appear lazy and uncooperative? The answers to these questions might make the difference between survival and failure for a business. There is no one “correct” theory of motivation. Instead, several valuable theories contribute to our understanding. Let’s look at some theories that have been used by I/O psychologists over the last few decades to understand work behavior.

The two most popular theories of work motivation in the 1960s were Frederick Herzberg’s (1966) job enrichment theory and the application of B. F. Skinner’s (1969) reinforcement theory to work settings. Herzberg proposed that the nature of the work is motivating in and of itself, aside from any rewards. His prescription for increasing the motivation of a worker is to enrich the job by increasing the worker’s responsibilities and the job’s challenges. He conceded that external rewards such as money and praise are also necessary to attract and keep a worker, but ultimately, he proposed that motivation depends on whether the job is interesting. The implications of Skinner’s reinforcement theory are just the opposite. Reinforcement theory postulates that jobs acquire interest only through their association with extrinsic or external rewards. Attempts to motivate workers are based on ensuring that desired work behavior is followed by meaningful rewards.

Both of these theories have value. Consider reinforcement theory. There can be no doubt that associating certain rewards with work behavior can result in an increased probability that this behavior will occur again. If you get $20 each time you take a phone order for a telemarketing firm, you will probably stay on the phone for many hours a day. The problem is that not all work behaviors are as simple and discrete as taking a phone order. How would one apply contingent rewards to a police officer, a teacher, or a nuclear power plant control operator? Would everyone be equally motivated by money? Problems arise with Herzberg’s job enrichment theory as well. It seems that some people don’t want enriched jobs and that some jobs can’t be enriched without massive, expensive, and time-consuming work redesign. Each theory has its strengths, but neither approach works in all situations.

Two additional theories of work motivation that have attracted interest are expectancy theory and self-efficacy theory. Expectancy theory (Porter & Lawler, 1968; Vroom, 1964) has a cognitive slant. It is based on the premise that people operate based on a prediction of what rewards they will receive for certain work behaviors. Unlike reinforcement theory, which assumes that associations are stamped in automatically, expectancy theory asserts that individuals make mental calculations about what is being asked of them and the probability of their receiving something they desire for specified performance, then take action based on these estimates. Albert Bandura’s (1995) self-efficacy theory proposes that individuals gradually develop confidence (or lack of confidence) about their ability to overcome obstacles and successfully complete difficult tasks. This confidence can be diminished or enhanced by their actual work experiences.

Today, the concept of self-efficacy is often considered within broader models of self-regulation, which refers to people’s capacity to direct, control, and alter their behavior. Self-regulation includes making and executing plans, initiating and inhibiting behaviors, taking responsibility, and exhibiting self-discipline. Self-regulation is important to many aspects of employee behavior, including “fitting in” with coworkers. Winning acceptance from colleagues requires good social skills, as one must have the ability to form relationships, build a positive reputation, and behave in ways that are deemed acceptable. To succeed in these tasks, individuals must often be able to modify their behavior to conform to the ideals regarded as acceptable in their groups (Baumeister et al., 2005).

Expectancy, self-efficacy, and self-regulation theory are all highly regarded models that have been applied with some success in work settings. Expectancy theory is implemented by making sure that workers have a clear understanding of the likelihood that successful performance will be followed by a desired reward. Self-efficacy theory has been applied in the workplace by selecting workers with high self-efficacy and then creating conditions that maintain and enhance workers’ feelings of competence. Self-regulation theory is important as it suggests why some individuals are self-starters or why some are better able than others to work in the teams that modern companies often rely on today.

Another motivational theory that has received considerable attention is goal-setting theory (Locke, 1968, 1970). This theory is potent in its simplicity. It proposes that the best way to increase effort is to set specific, challenging goals for a worker. You will recognize the same principle at work in athletic training. For example, if you want to run a sub-40 minute 10K, you need to set challenging training goals (such as running at least one 6-minute mile in every 5-mile run, and so forth). According to goal-setting theory, even if you do not reach your goal, you will perform
better and work harder than if you had not set specific goals.

**Job Satisfaction**

Closely associated with work motivation is *job satisfaction*. Recently, the term “quality of working life” has been used as a synonym for job satisfaction. Presumably, people want to gain satisfaction from their work and to avoid dissatisfaction. What factors lead to job satisfaction and what are its consequences?

More research has been done on these topics than almost any subject in I/O psychology. Thousands of studies have led to the basic finding that the primary sources of job satisfaction are interesting and challenging work, pleasant co-workers, adequate pay and other financial benefits, opportunities for advancement, effective and supportive supervisors, and acceptable company policies. In contrast, job dissatisfaction results from the absence of these characteristics. Many of us have had what we called “boring” jobs. This is the other side of the satisfaction coin. For a fascinating glimpse at the most unsatisfying jobs that one might have, read the entertaining and illuminating books of Barbara Garson (1988, 1994), which describe boring jobs and how people cope with them.

Most organizations take the emotional temperature of their employees by periodically administering questionnaires. These questionnaires typically ask workers to rate their levels of satisfaction on the basic factors we’ve listed. Organizations go to the trouble of gathering this information because they believe that job satisfaction is related to employee absenteeism, turnover, and productivity. For instance, most managers believe that dissatisfied employees are likely to take excessive sick leave or to seek employment elsewhere. Because absenteeism and turnover are costly, employers try to reduce them by increasing job satisfaction. Most managers also believe that job satisfaction leads to increased productivity. That assumption is more questionable. Several decades of research have failed to demonstrate that satisfaction causes productivity. Some research, however, does indicate that *productivity causes satisfaction* (Locke, 1976). In other words, it appears that workers who are able to accomplish work goals and overcome work-related challenges are happier than those who do not have such experiences.

What are the implications of the research findings on job satisfaction? First, if a company wants a stable workforce, it should try to minimize employee dissatisfaction with key job factors (pay, opportunities for advancement, and so on). The concerned employer can make necessary adjustments based on the analysis of work-related attitude questionnaires distributed on a regular basis. In addition, an employer that wants high productivity and happy employees should ensure that they have the necessary resources (equipment and technical support) and should solve any problems that arise on the job. In short, the employer’s job is to remove obstacles to success.

There are, of course, other reasons for fostering job satisfaction beyond boosting productivity and reducing absenteeism. There is no reason that people should not derive happiness from their work, just as there is no reason that they should not derive happiness from other activities. Conversely, evidence suggests that dissatisfying and stressful work environments can lead to physical and psychological damage (Karasek & Theorell, 1990; Landy, Quick, & Kasl, 1994). Any environment in which people spend half or more of their waking hours is bound to have the potential for affecting psychological well-being. Organizational psychologists look for ways to make these effects more positive.

Up to this point, we have been considering the individual as a social-emotional island in the larger organization in which he or she works. Let’s expand that picture a bit. Workers go about their business in a number of social contexts. For example, in most jobs the individual works most closely with a group of others, often called a *team*. Furthermore, the team works within a psychological environment created by the person supervising it, commonly referred to as the *leader*. Finally we have the “personality” of the organization itself, which is often referred to as the *culture* of the organization. Each of these variables—the team, the leader, and the organizational culture—can influence workers’ motivation and satisfaction. Let’s briefly consider each of these variables.

**Work Teams**

Until 20 years ago, the concept of a work team was an unusual one for companies in the United States. Although work teams were used extensively by European companies (such as Volvo in Sweden), they were the exception in North America. The downsizing epidemic of the 1980s changed that. American companies decided to radically reduce their workforces. This move usually meant eliminating many mid-level management positions. Fewer people were expected to do more work with less supervision. As a result, teams began to emerge as the new paradigm for effective organizations. Other forces were at work as well. Using loosely managed teams had the effect...
Work teams play an increasingly important role in contemporary business and industry. Cognizant of this reality, organizational psychologists have conducted hundreds of studies on how to enhance the efficiency of work teams, including “virtual” work teams.

Virtual teams.

of increasing accountability and ownership at increasingly lower levels of the organization. This change improved both work motivation and job satisfaction (through participative goal setting and job enrichment). Since the shift toward team work, I/O psychologists have devoted a good deal of effort to understanding team formation processes, the advantages of teams, and the optimal conditions for team functioning (Guzzo & Dickson, 1996).

Additionally, with the emergence of the Internet, I/O psychologists are asked more and more frequently to help facilitate the effective operation of virtual teams. Virtual teams are very much like traditional work teams in that all members work on the same project. The main difference is that these members are working from various locations. In some cases they may be separated by thousands of miles and many time zones. Because of the globalization of commerce, the use of virtual teams is increasing. While technological advances have made virtual teams a valuable and convenient option, several possible disadvantages must also be considered. Virtual teams can experience problems resulting from time differences, local/cultural differences, and inadequate face-to-face interactions. Moreover, they may lead to excessive reliance on technology, which can be a risk factor in striving to complete a project (Gibson & Cohen, 2003). Thus, I/O psychologists who work this arena must study the most effective ways virtual teams can be implemented and managed.

Leadership

A more traditional area of interest for organizational psychologists has been the study of leadership. Are leaders born or made? Based on decades of research, the answer appears to be a little of both. In recent years, I/O psychologists have been particularly interested in transformational and charismatic leadership. The term “transformational” is used because change and adaptation to change are emerging as the hallmarks of the successful modern company. The transformational leader is one who has a compelling vision of what he or she wants to accomplish and transforms followers’ beliefs, values, and needs (Bass, 1990, 1995). Transformational leaders seek to realize their goals by making workers or followers more aware of the importance of what they are doing, persuading them to put the good of the organization or team ahead of their own self-interest, and appealing to their achievement and mastery needs (Hughes, Ginnett, & Curphy, 1996). Charismatic leadership depends more on the sheer force of a leader’s personality, as opposed to the appeal of the leader’s vision. Charismatic leaders elicit trust in others, are willing to take personal risks, and are sensitive to others’ needs (Conger & Kanungo, 1994). Charismatic leaders are able to get followers to suspend disbelief and to accept challenges that they would ordinarily reject.

A more recent topic in this area is the concept of emancipatory leadership described by Corson (2000). Emancipatory leadership’s guiding principle is that leadership should reflect the constituency it serves. Emancipatory leaders make sure that those affected by leadership’s decision making play a role in those decisions and are responsible for their implementation. The power and presence of leaders are minimized while democracy and inclusion are maximized. Emancipatory leaders understand their own boundaries and biases. They strive to empower their employees rather than to rule them. Moreover, they resist stereotypes and limits that impede the progress of members of minority groups. This leadership model has been proposed to be ideal in situations where an organization is undergoing change related to increasing diversity.

Another emerging line of research suggests that leaders’ emotional intelligence has a considerable impact on their leadership effectiveness. According to Jennifer George (2000), emotional intelligence—the ability to understand and manage moods in oneself and others—contributes to effective leadership in organizations. For example, Zhou and George (2003) review research suggesting that the emotional intelligence of leaders plays a critical role in fostering creativity in workers. Emotionally intelligent leaders may help team members who have recently experienced a work-related disappointment to productively use their emotions to analyze the situation and make necessary changes. George believes that emotional intelligence is a talent that anyone can develop through self-reflection, reading, mentoring, and coaching. In any event, as organizations continue to evolve and change, leadership will remain a critical area of inter-
Organizational Culture and Climate

Every organization, no matter how small or large, has a "personality." In simple terms, it is this personality and the value system of the organization that is referred to as culture in organizational psychology jargon (Denison, 1996). The culture of the organization is manifested in its rituals, language, traditions, symbols, and unwritten rules. I/O psychologists are primarily interested in how employees (as opposed to clients or customers) experience organizational culture. Employees' perceptions of their organizational culture can create variations in workplace climate. Climate consists of shared perceptions among workers about specific aspects of the workplace environment that can affect workers' behavior and social interactions. For example, I/O psychologists might be interested in an organization's "climate for diversity," its "climate for service," its "climate for innovation and creativity," or its "climate for safety." An organization's culture and climate can have a dramatic impact on its effectiveness and productivity.

Different companies cultivate different organizational cultures. For example, the culture of a Silicon Valley Internet company might hinge on innovation. The culture of a fast food delivery service like Domino's Pizza tends to be dominated by—what else—time urgency. In regard to organizational culture, the chief issue for I/O psychologists is to understand how this culture is developed, maintained, and changed and the resulting climate for employees. For example, in the late 1970s and early 1980s, a number of nuclear power plant mishaps occurred, including those at Three Mile Island and Chernobyl. Controversies swirled regarding the safety of the global nuclear power industry. From those debates, a new culture emerged that placed a much greater emphasis on safety. Virtually every organization that produces goods and services that could affect public safety at the broadest level (such as power plants, aircraft manufacturers, and companies that produce toxic waste byproducts) now attempts to impress on workers the need to commit to a culture that values safety. The challenge for the I/O psychologist is how to facilitate the development of this culture through the implementation of human resource systems (such as selection, performance appraisal, and promotion programs). The frequent monitoring of employees' attitudes regarding safety through annual surveys helps employers learn the extent to which the importance of safety has been assimilated by employees. Zohar and Luria’s (2005) research on almost 4,000 production workers in 401 different work groups in manufacturing plants suggests that safety climates should be assessed regularly at various levels within organizations.

Balancing Work and Other Spheres of Life

Another emerging trend in organizational psychology is increased interest in how employees balance work obligations and their personal lives. Research in this area often focuses on the design and evaluation of programs intended to reduce stress at work. Ultimately, the goal is to develop programs that enhance employees’ work life and their family life.

A recent review of the work-family literature (Eby et al., 2005) revealed that this research has focused on nine topics: (1) work-family conflict, (2) work role stress, (3) work-family assistance, (4) work schedules, (5) job-related relocation, (6) career and job-related outcomes, (7) gender and the relationship between work and family domains, (8) the challenges of dual-earner couples, and (9) relationships among life domains. Although the work-family interface has traditionally fallen within the realm of organizational psychology, it is also relevant to other branches of I/O psychology. For example, personnel psychologists may be interested in how family obligations tend to affect workers' performance, while human factors psychologists may be interested in how different work schedules correlate with workers' productivity and their quality of life outside work. For instance, Fritz and Sonnentag (2005) examined the impact of weekend downtime on health and job performance. They found that time off from work, the extent of work-related hassles, and the level of nonwork stress are significant correlates of subsequent work-week performance, as well as of employee health.
Human Factors Psychology

Whenever you get into an unfamiliar rental car and begin to search for the controls for the lights and the windshield wipers, you are dealing with a human factors issue. When you turn the right handle on a faucet in a hotel room and get a glass of hot water instead of a glass of cold water, you are dealing with a human factors issue. In fact, human factors psychology has been referred to facetiously as “knobs and dials” psychology (Carter, 1978) because early in its development the field concentrated on devising the most effective ways of displaying information (the best designs for dials and gauges) and of taking actions (the best designs for knobs and faucet handles). This research dealt with the best placement of knobs and dials, the arrangement associated with the fewest performance errors, and so forth. Human factors specialists were also referred to as human engineering psychologists, because they designed environments and equipment to match the capabilities and limitations of human operators. They took both human attributes and engineering principles into account.

Human factors specialists seek to understand the human-machine relationship in various environments. Although such psychologists might be involved in designing home environments, health care environments, educational environments, and consumer products, we will concentrate on the application of human factors principles to the work environment. The basic challenge in human engineering efforts is depicted in Figure M.4.

As you can see, the human-machine system has several components. An important component is information in the environment. That information is displayed to the human being through devices such as dials, meters, computer screens, and printouts. In your car, the gas gauge is a display that provides important information, as are the speedometer, the odometer, and the oil and temperature lights. The fact that you must interpret and possibly use this information creates a design challenge. How can this information be best displayed? Systems specialists refer to this “confrontation” of the individual and the information as an “interface” problem and strive to make the interface as effective as possible. As Figure M.4 illustrates, the individual must interpret the information in the display and choose a course of action (or inaction) based on that information. Doing so creates a second interface, between the individual and the device that modifies or has an influence on the system.

Let’s take the simple example of a machine operator adjusting the speed of a machine. The actual speed of the machine is presented in a digital readout on the face of the machine. This is the display part of the system. If the speed is too fast or too slow, it can be adjusted with a series of keyboard buttons on the machine console. This is the control part of the system. Thus, the operator looks at the digital display for information, keys in a series of commands that speed up or slow down the machine, and then reexamines the display to make sure that the target speed has been achieved. If the speed is still too fast or too slow, or if the adjustment has been too extreme, the operator keys in new and more refined information and keeps checking the digital display until the desired speed has been achieved. This is a description of a simple combination of human, display, and control. A less elegant but equally relevant example is the system that includes the driver of an automobile, the speedometer, the cruise control system, and the gas pedal. The driver wants to maintain a constant speed compatible with the speed limit posted for that highway. The driver activates the cruise, presses the gas pedal down until the desired speed registers on the speedometer, presses the “set” button on the cruise control, and watches to see whether the speedometer settles in at the desired speed. The speed of the car may be slightly faster or slower than the driver desired, so another round of actions may be needed to achieve the final desired speed. This is an excellent example of the interface between a machine and an operator, complete with a feedback loop.

Most of the early human factors research was geared toward achieving satisfactory interfaces between human and display and human and control. For example, it was discovered that many of the air-
plane accidents that occurred in World War II were caused by either faulty displays or faulty controls. Faulty displays included dials that were placed outside of the pilot’s line of vision or that presented information in a way that was difficult to interpret. Many of the control problems came from confusion of one control with another. For example, the knobs that activated the flaps were identical in shape to those that activated the landing gear. As a result, many pilots who meant to retract the landing gear shortly after takeoff actually engaged the flaps, causing a crash. The solution to this problem turned out to be relatively simple. Each knob was given a distinctive shape that conveyed its particular function. Thus, the knob that controlled the landing gear was shaped like a wheel, whereas the knob that controlled flaps was actually shaped like a flap. Meanwhile, dials were arranged more centrally so that they were easier to see and were given a standard location in all planes.

Similar principles of human engineering are applied today in many areas of technology. As an example, the design of control rooms for nuclear power plants has been influenced greatly by human factors psychology. Consider the control panel shown in the photos on the right. Just drawing lines and borders and providing labels for clusters of controls and displays helps make the information-processing task easier. The simple act of grouping similar information sources can reduce the probability of errors.

Consider the consequences of a situation in which information was not presented efficiently. At the Dallas–Fort Worth Airport, American Airlines flies out of several terminals. This means that you cannot simply pick the correct terminal for your departing flight by knowing you will fly American. The Airport Authority decided to display individual flight information on a large electronic billboard at the ramp for each terminal. So if you planned to take an American Airlines flight to Denver, you needed to scan that billboard while steering your car through dense traffic, at speeds often exceeding 40 miles per hour. To make matters worse, there could be several flights on American to Denver, each leaving at a different time from a different terminal. So you would need to look not only for the Denver flight but for the correct Denver flight. As you might expect, a serious accident was caused by a motorist looking for the correct American Airlines flight while trying to navigate through a maze of similarly confused drivers. As a result of a successful lawsuit filed by the injured driver, the information about flights has now been moved to the entrance to the airport where drivers must stop at a toll booth to obtain a parking ticket. To learn more about the importance of human factors to the design of both simple and complex equipment that people use daily, look for Don Norman’s The Psychology of Everyday Things (1988) and The Design of Everyday Things (2002) and visit www.baddesigns.com.

Human factors specialists follow a number of principles in designing equipment and environments. One central principle is response stereotype, which is people’s tendency to expect that a control will work in a particular way. Most people believe that when they want to open a door, they should turn the doorknob clockwise or pull the handle down. When they have to turn the doorknob counterclockwise or pull the handle up, they become confused and act less efficiently. Therefore, one of the basic design principles is to see how people will carry out Visual displays can often be enhanced to help workers find information more quickly. The top photo shows a section of a display panel from a nuclear power plant control room before it was redesigned. The bottom picture shows how this display panel was modified to make it easier for operators to locate needed information quickly.
on research from all three domains of I/O psychology (personnel, organizational, and human factors psychology), showing once again that the three areas are highly interdependent.

Figure M.5
Guidelines for reducing stress in the workplace.

Work stress is an important matter that has been the subject of a great deal of research. The guidelines shown here are based on a review article by Sauter, Murphy, and Hurrell (1990), as summarized by Jewell (1998). The guidelines draw on research from all three domains of I/O psychology (personnel, organizational, and human factors psychology), showing once again that the three areas are highly interdependent.

### REDUCING WORK STRESS

#### Workload and work pace
- Physical and mental job demands should be in the range of individual resources and capabilities.
- Allow time to recover from demanding tasks.
- Increase individual control over work pace.

#### Work schedule
- Demands and responsibilities off the job should be considered in setting individual work schedules.
- Rotating shift schedules should be stable, predictable, and in a forward (day-to-night) direction.

#### Job future
- Employees should be made aware of avenues for growth and promotion opportunities within the organization.
- Employees should be informed in a timely manner of impending changes that may affect their employment.

#### Work roles
- Job duties should be clearly defined and explained.
- Conflicts as to job expectations should be avoided.

#### Social environment
- Job design should not isolate employees from opportunities for support and/or assistance from others.

#### Job content
- Meaning, stimulation, and opportunity to use skills on the job are desirable.

#### Participation and control
- Employees should be able to provide input on decisions or actions affecting their jobs or the performance of their tasks.

Advancing technology will continue to make human factors research important in many sectors of the economy. For example, human factors issues are at the forefront of the growing use of distance education in colleges and universities. How do distance learning programs compare to traditional classrooms in terms of learning outcomes? Are some distance learning formats, such as those that allow for interaction between the teacher and audience, more effective than others in promoting learning? The biomedical fields also are presenting all sorts of new challenges for human factors experts. Have you seen the commercial in which a doctor in one part of the world is guiding the surgery that another doctor is performing elsewhere? Human factors psychologists may ask, are there ways to enhance the technology used by the medical profession to convey information more accurately and efficiently, with minimal mistakes?

### A Systems Approach to Work Safety: Putting It All Together

Workplace safety can serve as an example of the interrelation among personnel psychology, organizational psychology, and human factors psychology. Consider the problem of pizza delivery drivers who have excessive accidents when trying to deliver pizzas in under 30 minutes. How could accidents be reduced? Working from a personnel psychology perspective, one approach would be to determine whether particular individuals seem to have more accidents than others. If that is the case, experts could examine the basic abilities of these people and institute either a training or a selection program to reduce the accident rate. We know, for example, that younger drivers and older drivers tend to have more accidents than middle-aged drivers. We also know that pizza delivery drivers tend to be young (and newly licensed) drivers. Thus, it would be important to provide a careful training and monitoring program to make sure that the drivers know and obey the rules of the road.
An organizational psychologist might approach the problem by assuming that the drivers are being strongly influenced by a speed culture. As an example, the founder of Domino’s Pizza, Tom Monaghan, wrote a book and gave motivational speeches preaching that on-time delivery was a matter of life and death for the Domino’s manager (Monaghan & Anderson, 1986). Similarly, drivers were expected to call out times when they left the store and returned to the store so that fellow workers would know whether they had made an on-time delivery. This approach could be seen as the antithesis of the safety culture described earlier.

Alternatively, it might be just as effective to work from a human factors perspective and prevent a driver from delivering more than one pizza every 30 minutes. Thus, speeding to and from the store would be largely useless. Changing the nature of the task would enhance safe deliveries. A “new” and safer job would have been designed. The safest system would probably be achieved by using all three approaches rather than just one. In the pizza delivery example, this approach would include a careful selection and training program, a work environment that did not glorify speed and time urgency, and a set of tasks optimally arranged for safe and efficient deliveries.
References


