Chapter Three

Vocational Interests
Matching Self-Concept with the Work Environment
Robert Hogan
Rex J. Blake

This chapter reviews the implications of individual differences in interests and values for how people behave at work and how they are regarded by their co-workers. Let us begin with some definitions.

Introduction and Definitions

Peters (1958), in an important analysis of the concept of motivation, distinguishes between causes and reasons as explanations for social behavior. Causes as explanations are processes (biological or physiological) inside people that somehow propel them into action. Reasons as explanations, on the other hand, refer to people's intentions, goals, and agendas; reasons are mental or intrapsychic constructs that provide direction and focus for people's actions. Peters goes on to argue that, for most everyday purposes, we explain a person's actions in terms of what he or she intends or wishes to achieve by a course of action. Thus intentions, goals, and agendas have a unique role to play in the explanation of social action.

Needs, drives, values, and interests are closely related concepts; they are motivational terms that refer to the intentions or goals of a person's actions. Needs are typically seen as the most fundamental of these constructs, and many people regard needs or drives as having a physiological basis. Peters (1958) takes exception to
this popular notion. The concept of need or drive, Peters notes, postulates a mysterious end-state of quiescence, satisfaction, or tension reduction that is never measured or observed: "Psychology's advance, at any rate toward conceptual clarity, would surely be more rapid still if we were admitted that it is only the directedness of behavior that is entailed by saying that it is motivated, not any specific causal conditions of 'drive' or anything else" (p. 42).

To distinguish among needs, values, and interests may be as much a matter of semantics and personal choice as anything else because the terms have been used interchangeably in much of psychology. Values generally have been the most inclusive construct; Davis (1980) notes that various authors regard values as equivalent to beliefs (Allport, 1961; Rokeach, 1973), attitudes (D. T. Campbell, 1963), needs (Maslow, 1954), interests (Allport, 1961; Perry, 1954), and preferences (Katzell, 1964; Rokeach, 1973).

Needs, values, and interests are constructs inferred from the patterns of an individual's activities or stated intentions. They differ primarily in their breadth and level of abstraction. Super (1973) puts needs at the top of the hierarchy of abstraction. He sees both values and interests as lower-order constructs derived from needs. Values are conceptualized as objectives sought to satisfy needs. Interests comprise the specific activities and objects through which an individual attains values and satisfies his or her needs. Interests, then, are the least abstract constructs in Super's hierarchical representation of motivational terms. Davis (1980) suggests that interests, along with attitudes, needs, values, and preferences, are a set of constructs that represent "an affective orientation toward stimulus objects" (p. 77). Like Super, he suggests a hierarchical arrangement of the constructs. "Attitudes appear to be the most general construct and refer to a favorable-unfavorable (accept-reject) orientation toward attitude objects. Needs and values refer to the importance-unimportance to the subject of the stimulus object. By contrast, preferences and interests refer to the dimension of liking-disliking for the stimulus object" (p. 77).

Although there are some differences between Davis's and Super's hierarchies, both people regard interests as the most specific and least abstract construct in a hierarchy of motivational terms.

Constructs at the more abstract levels of the hierarchy have been linked to lower-order variables by means of measures of those constructs. To assess individual differences in the higher-order constructs requires translating them into more specific exemplars. For that reason, constructing a measure of a particular need (for example, the need for achievement) requires identifying the values, preferences, and interests that characterize that need (for example, valuing success and accomplishment, preferring recognition over anonymity, and expressing interest in competitive activities).

The availability of instruments to assess for constructs at the lowest level of the hierarchy has not automatically forged links to other motivational constructs. In particular, the measurement of particular interests does not require inferences about relationships to higher-order constructs. Interpreting a respondent's endorsement of the item "I like tennis" requires no assumptions about the motive(s) or goal(s) that explain his or her expressed attraction to the sport; that preference could be based on any of a number of underlying motives. Klinger's distinction (1977) between needs and current concerns seems relevant. According to Klinger, "A need or motive such as 'achievement' or 'affiliation' can subsume a wide range of possible concrete goals, any one of which may be the focus of a current concern. Thus, someone with a high need to achieve may have separate current concerns about setting a new sales record, beating his or her tennis partner, and patenting a new design for a mousetrap. On the other hand, someone interested in setting a new sales record may be doing it for the money, not because of a need to achieve" (p. 350).

Thus, connecting interests with the constructs from other motivational domains may be a rather complex process; an interest in a particular activity could conceivably represent any of a number of underlying motives. Moreover, interests can have predictive utility (in that an individual's future choices of and reported satisfaction with particular activities, occupations, and types of people often reflect those that the individual found satisfying in the past) without requiring the identification of a higher-order construct as the source of the covariation. That is indeed how vocational interest measurement developed. Researchers have generated a considerable empirical literature demonstrating significant predictive utility for measures of vocational interests. Thus far, however, there has been little progress in connecting interests to constructs in other domains (Davis, 1980; Holland, 1976). Holland (1976) notes
the separation of interest measurement from the rest of psychology with marked dissatisfaction: “The interest literature still remains largely outside the mainstream of psychology and sociology. The sheer empirical success of these inventories may have relieved interest enthusiasts of the need to cultivate other parts of psychology. Subsequently, neither group—interest types and the other types in psychology—have developed useful dependencies upon one another. Consequently, the interest literature remains a rambling, formless literature integrated only by a few popular inventories and unable to draw on the strengths of personality and learning theory and vice versa” (p. 523).

The foregoing discussion can be summarized in terms of three points. First, terms such as needs, values, and interests overlap substantially in their meaning. Second, these terms can be placed in a hierarchy of abstraction, with interests as the least and values as the most abstract. Third, although philosophers regard these terms as crucial for explaining social action, psychologists have been largely uninterested in the conceptual relations among them.

The Meaning of Interests

For most of the history of interest measurement, researchers have been concerned with demonstrating the utility of the measures and have focused on operational rather than conceptual definitions. The need to demonstrate the practical utility of interest measurement may have been driven by early questions regarding the point of studying interests. Interest measurement was clearly seen as a somewhat questionable enterprise in its infancy. Strong (1943) observed that “some people in various walks of life, including psychologists, have considered the study of interests as of ‘no scientific value,’ ‘extremely silly and pernicious stuff,’ ‘a sheer waste of time,’ ‘useless and inane’” (p. x). Perhaps in response to such criticisms, interest measurement assumed from the outset a distinctly pragmatic character and emphasized its ability to predict meaningful outcomes—work satisfaction, occupational tenure, vocational choice, and so on. Researchers have also investigated the stability of vocational interests as well as the covariance structures underlying the items and scales of various self-report interest inventories. Theory—about what interests are—has generally taken a back seat to those other endeavors. Strong was content to define interests solely in terms of the responses to the interest test items. According to Strong (1960), interests are “activities that are liked or disliked. Each person engages in thousands of activities, or habits, if you prefer that term, and attached to each is a liking-disliking affective tone. They remind me of tropisms. We go toward liked activities, go away from disliked activities” (p. 12). Not surprisingly, many writers regard the interest literature as conceptually barren.

Nevertheless, Strong’s statement contains an implicit assumption about the motivational nature of interests; he regards them as having “directional” properties. Yet another statement by Strong (1955) acknowledges both the practical concerns that drove the construction of interest inventories (that is, career guidance and placement) and their conceptual/theoretical connection to other theories of human motivation: “Interest scores measure a complex of liked and disliked activities selected so as to differentiate members of an occupation from non-members. Such a complex is equivalent to a ‘condition which supplies stimulation for a particular type of behavior,’ i.e., toward or away from participation in the activities characteristic of a given occupation. Interest scores are consequently measures of drives” (p. 142).

Personality and Interests

We noted above that interests can be thought of as representing the lower level of a hierarchical arrangement of motivational constructs—a personality hierarchy of increasing abstractness and decreasing specificity as one ascends to successively higher levels. We would like to examine a bit more closely here the links between personality and interests. The notion that personality and interests are related, even equivalent, constructs has always appealed to vocational psychologists. Hansen (1984) characterizes that notion as “one of the most enduring hypotheses within interest measurement” (p. 116). If one probes beyond operational definitions of interests, virtually all the major players have, at one time or another, suggested that inventoried interests are manifestations of a more basic set of personality characteristics. Darley and Hagenah (1955), for example, regarded vocational interest measurement as
"a special case in personality theory" and proposed that "interests reflect, in the vocabulary of the world of work, the value systems, the needs, and the motivations of individuals" (p. 191). Layton (1958) considered interests to be "one aspect of what is broadly considered as the motivation of an individual... a part of the person's personality structure or organization" (pp. 3-4). Bordin (1943) regarded interest inventory scores as measures of "self-concept." Strong (1955) spoke of interest scores as measures of "drives" (p. 142). Super and Crites (1962) suggested a biological basis, arguing that interests are "the product of interaction between inherited neural and endocrine factors, on the one hand, and opportunity and social evaluation on the other" (p. 410). Roe (1957; Roe and Siegelman, 1964) regarded interests primarily as a reflection of one's social orientation; she suggested that parental relations during early childhood produced an orientation toward either "persons" or "nonpersons"—an orientation that in turn affected the development of an individual's pattern of interests.

Holland made what is easily the strongest statement regarding the relationships between interests and personality: "If vocational interests are construed as an expression of personality, then they represent the expression of personality in work, school subjects, hobbies, recreational activities, and preferences. In short, what we have called 'vocational interests' are simply another aspect of personality... If vocational interests are an expression of personality, then it follows that interest inventories are personality inventories" (1973, p. 7).

On the face of it, however, the content of the two types of inventories suggests that something quite different is being sampled in each. Hofstee (1990) suggests that the prototypical structure of the items comprising personality questionnaires is a "conditional" trait—that is, "an expressed predisposition to behave in a certain way in a particular situation" (p. 79). He also notes that the items comprising personality inventories typically consist of "a hodgepodge of descriptions of overt and covert reactions, trait attributions, wishes and interests, biographical facts, attitudes and beliefs, descriptions of others' reactions to the subject, and more or less bizarre opinions (e.g., 'Somebody is trying to poison me')" (p. 79). Latent characteristics of the respondent are inferred from the responses of those items. Rounds (in press) summarizes the content of interest items and scales as follows:

Broadly speaking, interest items and scales involve preferences for behaviors (response and activity families), situations (the context in which the preferred behaviors occur, usually occupations or physical settings), and reinforcer systems (outcomes or reinforcers associated with the behavior in the situation). On the response side, vocational interests are usually characterized by a shared property of the activities (Selling, Technical Writing, Teaching), and are often implied in the objects of interest (Mathematics, Physical Science, Religion) or inferred as a latent entity (Ente-

prising, Inquiring, Leading, Influencing); on the stimulus side, a shared property of the context (Office Work, Industrial) is invoked to explain interest covariation (p. 11).

Our view is closest to Bordin's argument (1943)—that is, equating interests with self-concept. R. Hogan (1983, 1995) points out that our evolutionary history as a group-living animal suggests that, at a deep level, people need attention and approval; at the same time, they need power, status, and control of resources, because persons who enjoy social acceptance and status have preferential opportunities for reproductive success.

Status and acceptance are exchanged during social interaction; thus most people spend their lives moving from one interaction sequence to another, seeking to gain, or not to lose, acceptance and status. During adolescence, people develop identities, idealized self-concepts—for example, scholar, athlete, fun-loving partygoer—and they use their identities to structure interactions.

When people respond to items on psychological inventories, the process is formally identical to what goes on during other forms of social interaction. People use their responses to tell an anonymous interlocutor about their idealized self-concepts—about how they would like to be regarded by the other person. Here, however, we come to a crucial difference between personality and interest inventories. Personality measures ask about typical responses in various situations, but interest measures ask about preferred activities, roles, and types of people. In doing so, they allow people to describe the preferred roles that constitute their ideal self-images. Thus interest inventories get much closer to the actual content of a person's self-concept and more directly reflect the image that he or she would like to be credited with.

Interest inventories may also allow self-description to proceed in a manner much more consistent with that found in social interactions.
between near strangers. Consider a typical conversation between people who have only just met in an informal, unstructured social situation. In response to the inquiry “Tell me about yourself,” we are much more likely to hear “I like tennis” than “In most situations, I am highly competitive.” People are accustomed to talking to others about themselves in terms of interests; interests are at the core of the language of social self-description.

The conventional wisdom of industrial and organizational (I/O) psychology is that interests and values reflect affective responses to specific people, events, and activities. Thus interests and values are stimulus-linked, in the sense that they are tied to specific references. In contrast with this view, we believe that interests reflect identities or idealized self-concepts; when people tell us about their interests, they are telling us about themselves and how they want or hope to be regarded.

The Structure of Interests

The structures that have emerged from analyses of the item and scale covariations in the personality and interest domains appear to be quite different. As recently as 1977, Kuder observed that “a definitive structure of interests has not been established” (p. 170). Like personality assessment, interest measurement has progressed toward a consensus regarding the structural properties of its domain, but the process has been influenced by the pragmatic orientation of the vocational interest field. As noted earlier, the field of interest assessment has had a markedly atheoretical quality. Whereas factor analysis has been only one route to theory development in personality assessment, Rounds (in press) suggests that “our current understanding of the interest domain, our approach to describing vocational interests, and the emergence of theoretical models have been largely the result of factor analytic research” (p. 3).

According to Rounds (in press), the application of factor analysis to the interest domain has suggested a roughly hierarchical structure within the domain, with approximately three levels of generality. At the lowest level are “occupational interest factors”; each represents a heterogeneous set of work activities that are characteristic of a particular work setting or occupation. Rounds offers “elementary education” and “library science” as examples of occupational interest factors. At a somewhat more general level are what Rounds calls “basic interest dimensions”; these “comprise work activities that transcend particular situations (occupations)” (p. 11). These are the dimensions that seem to emerge most reliably in item-level factor analyses of vocational interest inventories. They include such factors as “mechanical activities,” “mathematics,” or “outdoor activities.” The activities defining each of these factors seem intuitively similar, and Rounds notes that “most people describe their vocational interests using the language of basic interests” (p. 12). Finally, at the highest level are what have been called “general interest factors.” These typically emerge from higher-order analysis of the covariance structures of the basic interest dimensions. At this level, “the elements of the activity family (or occupational family) are dissimilar and an internal entity is postulated to explain their covariation” (Rounds, in press, p. 11).

Rounds suggests that, for the interest domain, the distinction between basic interest dimensions and the general interest themes corresponds to that between Meehl’s “surface” and “source” traits (1986). Scales designed to measure the higher-order, general interest themes have only recently become a regular feature of interest inventories. The increased attention to higher-level constructs is reflected in successive revisions to our longest-lived interest measurement tool, the Strong Interest Inventory (SII). This inventory began as a series of empirically keyed occupational scales. The number of occupational scales and the addition of both basic interest and general interest themes means that the current form of the SII contains scales corresponding to all three of the levels proposed by Rounds.

Although Strong (1943), Roe (1956), Holland (1973), and Jackson (1977) have proposed general interest schemes, Holland’s system is the most widely accepted and popular in the United States. Building on Roe’s work and on factor analyses reported by Guilford, Christensen, Bond, and Sutton (1954), Holland (1973) proposed a sixfold taxonomy for organizing individuals and occupations and described six occupational “personality types” (1985). (See Table 3.1.)

Realistic (R) types are practical, hands-on, real-world people who are action-oriented; Investigative (I) types are abstract, analytical,
Table 3.1. Holland's Adjectival Descriptions of Six Personality Types.

<table>
<thead>
<tr>
<th>Type</th>
<th>Adjectival Descriptions</th>
</tr>
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<tbody>
<tr>
<td>Realistic</td>
<td>Asocial, conforming, frank, genuine, hard-headed, materialistic, natural, normal, persistent, practical, self-effacing, inflexible, thrifty, uninsightful, uninvolved</td>
</tr>
<tr>
<td>Investigative</td>
<td>Analytical, cautious, critical, complex, curious, independent, intellectual, introspective, pessimistic, precise, rational, reserved, retiring, unassuming, unpopular</td>
</tr>
<tr>
<td>Artistic</td>
<td>Complicated, disorderly, emotional, expressive, idealistic, imaginative, impractical, impulsive, independent, introspective, intuitive, nonconforming, original, sensitive, open</td>
</tr>
<tr>
<td>Social</td>
<td>Ascendant, cooperative, patient, friendly, generous, helpful, idealistic, empathic, kind, persuasive, responsible, sociable, tactful, understanding, warm</td>
</tr>
<tr>
<td>Enterprising</td>
<td>Acquisitive, adventurous, agreeable, ambitious, domineering, energetic, exhibitionistic, excitement-seeking, extroverted, flirtatious, optimistic, self-confident, sociable, talkative</td>
</tr>
<tr>
<td>Conventional</td>
<td>Careful, conforming, conscientious, defensive, efficient, inflexible, inhibited, methodical, obedient, orderly, persistent, practical, prudish, thrifty, unimaginative</td>
</tr>
</tbody>
</table>

and theory-oriented; Artistic (A) types are imaginative and impractical and try to entertain, amuse, and fascinate others; Social (S) types enjoy helping, serving, and assisting others; Enterprising (E) types try to manipulate, persuade, and outperform others; and Conventional (C) types count, regulate, and organize people or things.

These types are portrayed in a hexagonal configuration in Figure 3.1. Their physical proximity indexes their relative similarity; adjacent types are more similar to one another than are types located at opposite sides of the hexagon. Although multidimensional analyses of scales designed to measure Holland's types rarely, if ever, reproduce a perfectly shaped hexagon, they generally replicate a circumplex ordering of the types (that is, RIASEC), suggesting that the internal relations among the types match Holland's model.

Figure 3.1 Personality Dimensions Underlying the Hexagonal Representation of Holland's Vocational Typology.

(Rounds, Davison, & Dawis, 1979; Rounds & Zevon, 1983). Alternative structural models summarizing the relations among the types have been offered (for example, Gati, 1991), but the evidence consistently supports Holland's hexagonal model as the most adequate representation of the structure of interests (Tracey & Rounds, 1992).

In the domain of interest measurement, Holland's model has attained about the same status as the Five-Factor Model (FFM) in personality assessment. The Journal of Vocational Behavior, vocational psychology's flagship publication, recently devoted an entire issue to Holland's taxonomic scheme. Holland's model has clearly had a major impact on the construction of interest inventories, his own—the Vocational Preference Inventory (VPI; Holland, 1985) and the Self-Directed Search (SD; Holland, 1973)—as well as those of others. In the early seventies, Holland's scales were incorporated into the
Strong-Campbell Interest Inventory (now Strong Interest Inventory, SII; D. P. Campbell and Holland, 1972; Hansen and Johansson, 1972). Subsequently, authors of other inventories—notably, the Unisex Edition of the ACT Interest Inventory (UNIACT; American College Testing Program), the Career Assessment Inventory, Vocational Edition (CAI-V; Johansson, 1986), and the Career Decision-Making Inventory (CDM; Harrington and O'Shea, 1982)—have developed alternative measures of Holland's themes. Even Kuder, who generated his own organizational scheme, has provided formulas to permit the translation of his scores into Holland's themes (Zytowski and Kuder, 1986). Although Roe offered a model that is, in many ways, similar to Holland's scheme, hers has not achieved the degree of popularity that Holland's has.

**Interests and Personality**

Our earlier discussion of the relationship between interests and personality was theoretical and largely speculative. What is the evidence that scales representing Holland's themes (or, indeed, any other interest scales) reflect personality characteristics? Empirical investigations of the relationship between interests and personality now span some fifty years, and the results have been mixed. Throughout this period, researchers have repeatedly tried to link measures of vocational interest to the scales of more prototypical 'personality' measures (for example, Athensou, O'Gorman, & Meyer, 1986; Berdie, 1943; Blake & Sackett, 1994; Bolton, 1985; Costa, Fozard, & McCrae, 1977; Costa, McCrae, & Holland, 1984; Cottle, 1950; Dunnette, Kirchner, & DeGidio, 1958; Gottfredson, Jones, & Holland, 1993; Hansen & Johansson, 1974; R. Hogan & J. Hogan, 1995; R. W. Johnson, Flammer, & Nelson, 1975; Naylor & Thorneycroft, 1986; Peraino & Willerman, 1983; Pryor, 1986; Siess & Jackson, 1970; Stewart, 1971; Turner & Horn, 1975, 1977; Wakefield & Cunningham, 1975; Ward, Cunningham, & Wakefield, 1976). The results of such correlational studies are remarkably consistent: small to moderate correlations between interest and personality scales that Hansen (1984) regards as "extremely disappointing" (p. 117). Hansen and others also acknowledge that the correlations nevertheless appear to be meaningfully patterned and systematic. Holland, who admits that "studies rarely result in substantial correlations between interest and personality variables" (1976, p. 532), nevertheless interprets the results as generally supporting his theory: "[T]he low-to-moderate significant correlations are largely expected ones: people with social interests have high scores on sociability scales, people with scientific interests appear less social, accounting interests go with being orderly, etc." (p. 532).

In the earliest studies, the lack of an accepted model of the structure of either domain hampered researchers' efforts to generalize their results beyond the scales of particular inventories. The study by Dunnette et al. (1958) is a case in point. Based on correlations between the basic scales of the Edwards Personal Preference Schedule (EPPS; Edwards, 1959), the California Psychological Inventory (CPI; Gough, 1957, 1987), and the occupational scales of the Strong Vocational Interest Blank (SVIB), the authors could conclude only that "the direction of the association among the various variables makes good 'clinical sense'" (p. 179). The authors appear to have had as much difficulty discerning meaningful relationships between the personality inventories as they did between either of the personality inventories and the occupational interest scales. By the time of R. W. Johnson et al.'s study (1975), the introduction of Holland's taxonomy afforded a "higher-order" view of the interest domain that could guide their interpretation of the correlations between the CPI and the occupational scales of the SVIB and illuminate potentially meaningful patterns within the tabulated correlations. Hansen (1984) cites the study by R. W. Johnson et al. as an example of empirical research that begins to converge on at least two broad dimensions of personality—social orientation and independent thought—which appear to account for most of the significant correlations between interest and personality scales. R. Hogan (1983) likewise proposes two broad personality factors as dimensions underlying Holland's hexagonal typology. Specifically, Hogan suggests that two orthogonal dimensions—Sociability and Conformity—define the plane occupied by the hexagon/circumplex. The proposed relationship of these dimensions to the hexagon is depicted in Figure 3.1. Hogan aligned the Conformity dimension (labeled Conforming/Nonconforming) with the hexagon such that Holland's Artistic and Conventional types respectively represent its low and high poles. The Sociability dimension (labeled Extraverted/Introverted) bisects the angle between the Enterprising and Social types on one side of the hexagon and between the Realistic and Investigative types on the other; Social and Enterprising persons...
are thus "extraverted types" and Realistic and Investigative persons are "introverted types." Blake and Sackett's multidimensional scaling analysis of interest and personality scales (1994) indicates that two broad factors derived from self-report personality inventories and corresponding approximately to Hogan's Sociability and Conformity differentiate among the Holland themes in a manner fully consistent with that proposed by Hogan.

In the last few years, there has been marked progress in developing an "adequate" taxonomy for the organization of major personality constructs; consensus is building around a set of three to seven broad dimensions that have been identified in factor analyses of natural language trait-descriptors and that also seem to be well represented in a number of self-report personality inventories. The same limited set of robust personality factors or themes can also be reliably recovered from analyses of adjective-based interpersonal ratings, self-descriptions, and standardized questionnaires (John, 1990; McCrae & Costa, 1985). The strongest proponents of what has come to be known as the Five-Factor Model assert that these themes "are both necessary and reasonably sufficient for describing at a global level the major features of personality" (McCrae & Costa, 1986, p. 1001). The so-called Big Five—Extraversion, Emotional Stability (or Neuroticism), Conscientiousness, Agreeableness, and Intellect (or Openness to Experience)—offer a framework for organizing and summarizing some of the existing research regarding the relationship of personality and interest domains (for example, Gottfredson et al., 1993) and validating scales intended to represent Holland's types (for example, Blake and Sackett, 1993). Research indicates that four broad dimensions of personality (Extraversion, Conscientiousness, Intellect, and Agreeableness) are consistently and significantly related to interests, while one (Emotional Stability) is not. Table 3.2 presents correlations between scales intended to measure a respondent's similarity to the Holland types and scales from various personality inventories identified as markers for the dimensions of the Five-Factor Model. It is easy to discern a distinctive pattern of correlations between each of the higher-order personality factors and the Holland types. Although the results support a fundamental connection between the two domains, the magnitude of the correlations suggests limited overlap. Interest inventories thus appear to provide unique information about respondents.

Table 3.2. Correlations Between Personality Factors and Holland’s Occupational Personality Types.

<table>
<thead>
<tr>
<th>Personality Scales</th>
<th>Hollander Type Scales</th>
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<tr>
<td></td>
<td>R</td>
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<tr>
<td>Extraversion</td>
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<td>Ambition (HI)</td>
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<td>Social Person (MPQ)</td>
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<td>Social Closeness (MPQ)</td>
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<td>Self-Sufficiency (16PF) (-)</td>
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<td>Suspiciousness (16PF) (-)</td>
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### Table 3.2. Correlations Between Personality Factors and Holland’s Occupational Personality Types, Cont’d.

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<td>Achievement via Independence (CPI)</td>
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*Note.* Values of .20 and greater are shown in bold.

*Key.* R = Realistic; I = Investigative; A = Artistic; S = Social; E = Enterprising; C = Conventional.

*Source.* MPQ (Multidimensional Personality Questionnaire) correlations with Strong Interest Inventory reported by Blake and Sackett (1993); CPI (California Psychological Inventory) correlations with Strong-Campbell Interest Inventory reported by Blake and Sackett (1993); GZTS (Guilford-Zimmerman Temperament Survey) correlations with Vocational Preference Inventory reported by Holland (1978); HPI (Hogan Personality Inventory) correlations with Vocational Preference Inventory reported by R. Hogan and J. Hogan (1992); MBTI (Myers-Briggs Type Indicator) correlations with Strong-Campbell Interest Inventory reported by Blake and Sackett (1993); NEO-PI (NEO Personality Inventory) correlations with Self-Directed Search reported by Holland, Johnson, Asama, and Pohl (1993); 16PF (Sixteen Personality Factors Questionnaire) correlations with Strong-Campbell Interest Inventory from Blake (unpublished data).

### Interests and Occupational Criteria

Strong (1943) noted that he could think of "no better criterion for a vocational interest test than that of satisfaction enduring over a period of time" (p. 385). Although job satisfaction has been studied directly, much research with interest measures has assumed that occupational membership implies satisfaction, and occupational membership has been the most popular dependent variable in the study of interests. This research has yielded relatively consistent results: members of different occupations respond differently to interest items, and many occupational groups can be distinguished on the basis of their interests. Furthermore, later occupational membership can be reliably predicted from interests measured at an earlier age. Strong (1935, 1943) reported long-term follow-up studies with the SVIB yielding impressive "hit rates" (as high as 78 percent) in the prediction of occupational membership based on interest scale scores obtained five to eighteen years earlier. Strong's findings have been replicated by many investigators using a variety of samples and methods (for example, Bartling & Hood, 1981; Brandt & Hood, 1968; Cairo, 1982; D. P. Campbell, 1966; Dolliver, Irvin, & Bigley, 1972; Dolliver & Will, 1977; Gade & Soliah, 1975; Hansen, 1986; Hansen & Swansen, 1983; Lau & Abrahams, 1971; Worthington & Dolliver, 1977; Zytowski, 1976). This body of work provides solid evidence that measured interests are valid predictors of occupational membership criteria.

Although these results are impressive, they nonetheless raise a question about more basic processes involved in occupational choice and tenure: What are the factors that contribute to a person's tenure in a particular organization or occupation? Davis and Lofquist (1984) propose that two relatively distinct appraisal processes affect tenure in a particular occupation. One is the degree to which a person is satisfied with the environment—the nature of the work, the working conditions, the compensation, the quality of relationships with co-workers and supervisors. The other is the degree to which the environment (that is, the employer) is satisfied with the employee. The implications of each of these appraisals for tenure is relatively straightforward. A dissatisfied employee will be more likely to leave an occupation or organization; an unsatisfactory employee will be more likely to be expelled. A more fine-grained analysis of the
relationship between interests and occupational success requires that the validity of measured interests for each of these criteria be considered separately.

Satisfaction

As noted above, Strong (1943) believed that the most appropriate criterion for assessing the validity of interests is satisfaction. Research on this topic, however, has produced mixed results. A number of studies have failed to find a significant relationship between interests and job satisfaction (for example, Bartling & Hood, 1981; Butler, Crinnion, & Martin, 1972; Cairo, 1982; Dolliver, Irvin, & Bigley, 1972; McArthur, 1954; Schletzer, 1966; Trimble, 1965; Zytowski, 1976). Others, however, have reported significant relations between job satisfaction and group differences in vocational interests (for example, Barak & Meir, 1974; DiMichael & Dabelstein, 1947; Hahn & Williams, 1945; Herzberg & Russell, 1953; Klein & Weiner, 1977; McRae, 1959; North, 1958; Trimble, 1965; Worthington & Dolliver, 1977). In the positive studies, the correlations have generally been low to moderate. Barge and Hough (1988) cite eighteen studies with a median correlation of .31 between interests and job satisfaction.

D. P. Campbell (1971) suggests that the modest relationships between interests and job satisfaction reported in the literature reflect a restriction in the range of the criterion variable. Depending on how the question is asked, most incumbents express satisfaction with their work. In a study of U.S. workers, for example, Weaver (1980) reports that more than 80 percent said that they were either somewhat or very satisfied with their jobs. It is also becoming clear that a variety of factors influence workers' judgments about whether a job is "satisfying." It is not clear that having "interesting" work, for example, is a major concern for all employees. Moreover, many features of the work environment—pay, security, and supervision, among others—that have little to do with the content of the work also influence satisfaction. Furthermore, there are marked individual differences in the degree to which any of these factors influence workers' feelings of satisfaction with a job (Davies & Lofquist, 1984). Finally, there is increasing evidence for individual differences in the degree to which workers express satisfaction with any job. Although some researchers disagree, individual differences in the disposition to experience positive and negative affective states appear to have significant implications for the use of self-reported job satisfaction as a dependent variable (for example, Burke, Brief, & George, 1993; Costa & McCrae, 1980; Levin & Stokes, 1989).

Satisfactoriness

There is little systematic research on the link between interests and the degree to which an employee is regarded by others as satisfactory. Nonetheless, surveys of existing studies typically yield reasonable validity coefficients. Most studies use performance ratings as criteria. Such studies involve a variety of occupational groups, including Navy enlisted personnel (Borman, Toquam, & Rosse, 1979; Dann & Abrahams, 1977; Lau & Abrahams, 1970), naval academy cadets (Abrahams & Neumann, 1973), forest rangers (Miner, 1960), supervisors (Strong, 1943), foremen and assistant foremen (Schultz & Barnabas, 1945), managers (J. C. Johnson & Dunnette, 1968; Nash, 1966), engineers (Dunnette & Aylward, 1956), and counselors (Wiggins & Weslander, 1979). Barge and Hough (1988) reviewed the results of eleven studies using performance ratings as the dependent variable and report correlations ranging from .01 to .40 (median r = .20). There is variability even within a single study: Lau and Abrahams (1970), for example, in a study of Navy enlisted recruits, report correlations between interest scores and performance ratings ranging from .15 to .38 (median r = .25). Although there are occasional negative findings (for example, Dunnette & Aylward, 1956), the validity coefficients compare favorably with those obtained with personality inventories and are occasionally quite large. Wiggins and Weslander (1979) report correlations of -.60 and .56 between the Realistic and Social scales of the VPI and the rated performance of counselors.

Although these results are intriguing, they are nonetheless tentative, because researchers have only a rudimentary understanding of the reasons for a relationship between interests and job performance. At present, there seem to be two lines of thought regarding the interest-performance relationship. These perspectives might be described as the task motivational and social evaluation models.
The task motivational model reflects the traditional view of task performances as an interaction between ability and motivation—
P = f(A x M)—where task-relevant interests are the motivational variable. This is a conditional model of task performance; in order to be successful at a task, an individual must be both able and willing to do it. In the absence of either sufficient ability or interest, successful task performance is unlikely. Interest alone is insufficient to guarantee performance; ability alone may be a sufficient condition for task accomplishment, but the likelihood of effective performance should increase with greater interest in the task. At lower levels of interest, a person will be less willing to engage the task and less likely to persist on a difficult task even if he or she begins it. At even lower levels of interest, disinterest becomes dislike and a person's antipathy toward a task leads to avoidance, making performance impossible—even for someone with adequate ability.

A handful of studies have found positive relations between interests and objective indices of worker productivity. Three of the studies cited by Barge and Hough (1988) used archival production records as dependent variables, and those studies found a median correlation between interests and performance of .35 (ranging from .24 to .53). Strong (1943) reported a correlation of .40 between interest scores and the productivity of insurance agents. Knaut (1951) reported a cross-validated correlation of .53 between a specially developed key and an objective criterion of performance (cost/sales ratio) for bakery shop managers. Clark (1961) concluded that work performance is an interaction between ability and interests; Clark's data indicate that interest scores predict job performance better at some ability levels than at others.

The ability of the task motivational model to account for the observed relations between interests, occupational membership, satisfaction, and employee satisfactoriness has some empirical problems. If interests predict occupational criteria primarily because they reflect task-relevant motivation, then the interests that characterize tenured workers in a particular occupation should parallel the activities required as part of the job. However, occupational groups often show distinctive patterns of interests that are not easily explainable on the basis of their "job-relatedness."

D. P. Campbell (1987), for example, compares personality and interest data from a sample of generals in the U.S. Army with samples of managers and executives from civilian organizations. Not surprisingly, the generals scored much higher than the members of the other two groups on a scale reflecting interest in "military activities." It is easy to understand why the military group had distinctive scores on "military" items; it seems unlikely, after all, that a person would have a career in the military if he or she disliked "drilling soldiers," "military people," and so on. It is harder to explain why the Army officers received low scores on measures of "artistic" interests. Actually, although the generals received the lowest scores in this area, all three groups scored well below the mean for the general population on "artistic" interests. The three groups resembled one another on a variety of dimensions, but they were distinguished from other occupational groups on a dimension that seems to have no direct bearing on their occupational activities. It is difficult to explain why these groups received low scores for artistic interests if we look only at job-relevant task motivation. Nor does this outcome seem to be a matter of the psychometric properties of the interest inventory. The Strong-Campbell Interest Inventory, which was used in the study, is not a forced-choice inventory. That is, respondents do not have to choose between military and artistic items; they can endorse both (but in the Campbell study generally chose not to). Nor are Campbell's data unique. Borgen (1986) notes that most of the empirical evidence regarding the occupational relevance of measured interests amounts to statements that have the form of "real estate salespeople like sales activities and dislike science." Interest in sales makes sense based on what real estate agents do; lack of interest in science is more difficult to explain. Borgen suggests that the blind empiricism that characterizes vocational interest research leaves many questions unanswered—for example, "Is it necessary to dislike science in order to be a successful realtor?" (p. 106).

The social evaluation model of the interest-performance relationship may contain the answers to these questions. For at least thirty years, I/O psychology has used performance ratings as an indirect method of sampling job performance, based on the hope that raters can evaluate the performance of ratees accurately with respect to job-relevant tasks and behaviors. An emerging perspective—the social evaluation model—regards performance ratings as evaluative phenomena that may not be directly related to
work performance. Stockford and Bissell (1976), for example, suggest that ratings reflect "primarily the personal-social relationships between supervisor and subordinate rather than the output of the subordinate in question." Borman (1983) notes that performance ratings depend on the same principles that characterize social perception and evaluation in general.

Subsequent studies by Borman (1974, 1987), Werner (1994), and others suggest that raters normally take a broader view of job performance than is indicated by the role prescriptions that come from a typical job analysis. It is increasingly clear that task performance typically accounts for only a part—and not always the major part—of a rater's evaluation of his or her co-workers' performance. In addition to the specific tasks required by a job, workers are usually expected to fulfill other role demands that are implicit in the interdependent social nature of most work settings.

When evaluating another member of a work group, raters consider, in addition to that co-worker's actual task performance, the degree to which that person goes along with rules, does what he or she is supposed to do, and maintains pleasant relations with supervisors and peers. Consequently, Dawis (1991) suggests that the term worker satisfactoriness be substituted for job performance. The former term more accurately describes the fact that criterion ratings usually consist of a rater's reported satisfaction with the rater. These considerations suggest that performance ratings can be seen as social evaluations that reflect raters' reactions to rater's rather than veridical reports of specific ratee behavior. This leads in turn to questions about the factors that influence such ratings, and these certainly include the values and characteristics of the raters. J. P. Campbell, Dunnette, Lawler, and Weick (1970) suggest that what observers "define as effective in others' job behavior depends importantly on their own characteristics" (p. 201); nonetheless, this view has not been well developed in I/O psychology.

The social psychological literature on interpersonal attraction also seems relevant to this discussion. That literature shows that similarity (of attitudes, values, interests, and backgrounds) is an important determinant of interpersonal attraction (Berscheid, 1985; Byrne, 1971; Levine & Moreland, 1990; Lott & Lott, 1965). A few studies have examined the effects of perceived similarity on hiring and selection decisions (Baskett, 1973; Wexley & Nemereooff, 1974; Rand & Wexley, 1975; Latham, Wexley, & Purcell, 1975) and performance evaluations (Miles, 1964; Pulakos & Wexley, 1983; Senger, 1971; Weiss, 1977; Wexley, Alexander, Greenwalt, & Couch, 1980). Their findings have generally been positive—that is, persons who are more similar to the raters get higher ratings.

Holland (1973, 1985) and Schneider (1987) suggest that, in order to understand organizational behavior, we need to understand the values, interests, and personalities of an organization's members. Holland has long maintained that "the character of an environment reflects the typical characteristics of its members. If we know what kind of people make up a group, we can infer the climate the group creates" (1985, p. 35). Schneider (1987) also argues that particular organizations attract, select, and retain particular kinds of people and that the behavior of an organization is a function of the kind of people it retains. Pfeffer's "organizational demography model" (1983) is similar, but it focuses on the shared biographical characteristics of incumbents. In each of these schemes, interpersonal compatibility determines an individual's "fit" with an organization. Consistent with the social psychological literature, interpersonal compatibility is associated with perceived similarity, and this in turn creates a tendency toward relative homogeneity of values, interests, and personality within organizations. Both Holland and Schneider define the environment of an organization in terms of the members' characteristics rather than their requisite tasks. They also suggest that taxonomies of work environments based on characteristic tasks may not predict particular work outcomes as well as taxonomies based on worker characteristics; in other words, person analysis may be more important than task analysis.

There is substantial empirical support for these ideas in the vocational interest literature. The notion that interpersonal similarity is psychologically important and that "birds of a feather flock together" is a cornerstone of vocational psychology (Darley & Hagenah, 1955, p. 19). Although the view has been criticized as unsophisticated and simplistic (for example, Crites, 1969), it has nevertheless generated an extensive empirical literature showing that the fit between workers in a particular occupation predicts work outcomes. Beginning with Strong's research, much vocational interest measurement has focused on identifying the distinctive
interest patterns of work environments. As noted earlier, occupational choice, membership, and job tenure are all related to the similarity of an individual’s interests with those of a target occupation. It is also possible that interests may be related to performance ratings, because they moderate the relationship between ability and task performance and because interests influence raters’ evaluations of others—both as co-workers and as friends.

As noted earlier, Holland’s taxonomy (1976) defines occupational environments in terms of members’ personality characteristics. The model also predicts how compatible individuals will be with others in particular occupational or organizational settings—and this in turn predicts how others in the work environment will react to that individual. To the extent that individual success depends on others’ reactions to—and subjective evaluations of—an incumbent, interest inventories are likely to be useful in a selection context.

Although vocational interest measures can forecast occupational success, they have a potential limitation as a personnel selection tool: because their items are transparent, they can easily be faked. D. P. Campbell (1971) reviewed forty years of research on the question of faking on the SVIB and concluded that scores on the inventory could be distorted by respondents but that the degree of distortion varied according to occupational scale and the transparency of the items. In most of the early studies reviewed by Campbell, the research consisted of asking examinees to complete the inventory with a normal set of instructions and then, after a delay, to fake their responses to resemble those of members of particular occupations. This research design was assumed to be analogous to a selection context in which applicants might try to distort their responses.

It is not clear, however, that people necessarily assimilate when completing an interest inventory under those conditions. Gray (1959) provides more direct information on respondents’ performance in selection contexts. He compared the scores for a group of college students who completed an interest inventory first when seeing a counselor and then again several months later when applying for medical school: “Forty-seven percent of the medical applicant group did not or could not raise their physician score between testing for counseling and testing for admission to medi-

ical school. Twenty-four percent raised their physician score enough to have a serious effect on its interpretation by an admissions officer; twenty-nine percent raised their score by a less important amount” (p. 296).

Abrahams, Neumann, and Githens (1971), comparing scores obtained from Navy ROTC applicants with scores obtained from those same applicants under earlier circumstances, reinforce Gray’s conclusions. They report a 97 percent overlap in the distribution of scores obtained under the two conditions and conclude that “there is neither a consistent nor significant tendency for applicants to increase their selection scores” (p. 11).

Conscientiousness and Work Outcomes: Implications of Holland’s Typology of Persons and Environments

We have made two major points thus far. First, motivational constructs can be organized in a roughly hierarchical structure. Abstract dispositional concepts (values) occupy the highest level of the hierarchy, and the concrete manifestations of those dispositions (interests) occupy the lowest level. Second, the pattern of an individual’s preferences as seen in his or her responses to an inventory of those preferences has important real-world consequences. Patterns of interests are demonstrably associated with vocational success and satisfaction. We have so far discussed these notions only in general terms. At this point, we would like to be more specific about the relevance of individual differences for outcomes in particular work environments. In particular, we would like to focus on the implications of research on Holland’s typology for the role of conscientiousness in worker success.

Much of the current literature concerning the relationship between personality and job performance assumes that conscientiousness is a universally valued personal characteristic—at least insofar as work behaviors are concerned. That assumption is reflected in Peabody and Goldberg’s suggestion (1989) of Work as an alternative label for the dimension known variously as Conscientiousness, Constraint, Dependability, Will to Achieve, Prudence, Self-Control, or Normative Orientation. Barrick and Mount (1991) explicitly state that “Conscientiousness is expected to be related to job performance because it assesses personal characteristics such as
persistent, planful, careful, responsible, and hardworking, which are important attributes for accomplishing work tasks in all jobs. . . . Thus, we expect that the validity of this dimension will generalize across all occupational groups and criterion categories" (p. 5).

Although Barrick and Mount find it “difficult to conceive of a job in which the traits associated with the Conscientiousness dimension would not contribute to job success” (p. 22), the evidence suggests rather wide variability in the relationship of conscientiousness to performance ratings across types and levels of occupations (for example, J. Hogan & R. Hogan, 1993; Hough, 1992). Hough (1992) surveys the results of a large-scale literature review of the relationship between higher-order personality dimensions and occupational criteria and concludes that conscientiousness (labeled Dependability in Hough’s scheme) predicts law-abiding behavior (mean $r = .58$) better than job proficiency (mean $r = .08$). Its effectiveness as a predictor of job performance also varies across occupational types. Hough reports, for example, a mean correlation of .24 between Dependability and job proficiency for samples of health care workers but a mean correlation of .03 between Dependability and job proficiency for samples of managers and executives.

Before discussing the reasons for this variability, let us reflect on the nature of the conscientiousness construct. A broad, multifaceted construct evident in the natural language, it is marked by such adjectives as organized, responsible, practical, thorough, hardworking, and thrifty (Goldberg, 1992). It also appears in most comprehensive personality inventories, either at the level of higher-order factors or as a single scale. In omnibus personality inventories, it involves such attributes as orderliness, impulse control, group conformity, and social conservatism. Normative Orientation (Gough, 1987), (low) Impulsivity (Buss & Plomin, 1975), Constraint (Tellegen, 1985), Superego Strength (Cattell, Eber, & Tatsuoka, 1970), Prudence (R. Hogan, 1986), and Orderliness and Social Conformity (Comrey, 1970) are all labels for this factor. As operationalized in most questionnaires, conscientiousness is not unidimensional. The various measures are typically complex, containing themes of independent thought, individuality, autonomy, spontaneity, and impulsivity, along with self-control, rule adherence, and rigidity. Consider Tellegen’s higher-order factor Constraint, which includes impulse control or restraint in both the task domain (that is, the lexical factor Conscientiousness) and the ideational or affective domain (that is, Openness to Experience). Tellegen’s Constraint emerges as a higher-order dimension from factor analyses of his Multidimensional Personality Questionnaire (MPQ; Tellegen, 1982; Tellegen and Waller, in press). According to Tellegen (1982), the MPQ “evolved out of attempts to clarify both the structure and content of the self-view domain” (p. 1). Through an iterative process consisting of assembling, administering, analyzing, and revising successive research questionnaires, researchers identified eleven primary and three higher-order dimensions. Because Tellegen’s object “was not to explore wholly unknown territory, but to arrive at a more instructive and useful map” (p. 2) of the self-view domain, there are clear linkages between both primary and higher-order MPQ scales and scales on other inventories. The higher-order MPQ factor Positive Emotionality is defined by the MPQ primary scales Well-Being, Social Potency, Achievement, and Social Closeness (Tellegen, 1982; Tellegen and Waller, in press). Negative Emotionality (the MPQ’s second higher-order dimension), which is marked by Stress Reaction, Alienation, and Aggression scales, defines a broad adjustment or emotional stability dimension. The MPQ’s third higher-order dimension, Constraint, is marked by three distinct primary scales: Control, Harm Avoidance, and Traditionalism. Tellegen (1982) describes high scorers on Control (versus Impulsivity) as reflective, cautious, careful, plodding, rational, sensible, level-headed, and habitually planful. Low scorers are impulsive and spontaneous, can be reckless or careless, and make no detailed plans, preferring instead to “play things by ear.” High scorers on the MPQ Harm Avoidance scale prefer “safer activities and experiences, even if they are tedious or aggravating” (p. 7). According to Tellegen, the item content of the MPQ Traditionalism scale reflects high moral standards, religious values and institutions, and strict childrearing practices. High scorers express positive regard for parents, value conventional propriety and a good reputation, oppose rebelliousness and unrestricted freedom of expression, and condemn selfish disregard of others. The three scales are relatively independent of one another, with intercorrelations ranging from $r = .17$ for Harm Avoidance and Traditionalism to $r = .27$ for Harm Avoidance and Control. Based on
Tellegen's description of Constraint (1982), John (1990) suggests that the factor shares a number of central features with the Conscientiousness dimension of the Five-Factor Model, "including caution, attention to detail, and appropriate impulse control, as contrasted with impulsiveness and distractability" (p. 87).

The Prudence scale of the Hogan Personality Inventory (HPI) resembles the MPQ Constraint factor and is composed of seven clusters of highly correlated items called homogeneous item composites (HICs; Zonderman, 1980). They are identified as Moralistic (showing strict adherence to conventional values), Mastery (hardworking), Virtuous (pursuing perfectionism), Not Autonomous (showing concern for others' opinions), Not Spontaneous (preferring predictability), Impulse Control, and Avoids Trouble (professing prudence). Factor analyses used to develop the HPI scales suggest two distinct clusters among these HICs. One reflects conformity, self-control, and responsiveness to authority. The second is defined by a concern for traditional values, social appropriateness, and a degree of self-righteousness. The parallel between these two underlying themes and those reflected in the Control and Traditionalism scales of the MPQ is unmistakable.

These two aspects of the broad concept of conscientiousness reflect two recurring themes in discussions of values and value orientations. They correspond to the notions of "work ethic" and "attitude toward authority"-notions that in the popular mind are particularly relevant to occupational performance and organizational citizenship.

Work Ethic

Certain people are believed to work hard because of their work ethic. We might say, for example, "They have a good work ethic in Oklahoma." The concept of work ethic is usually attributed to the German historian Max Weber (1904), who argued in his classic The Protestant Ethic and the Spirit of Capitalism that (1) the economies of Protestant countries after the Reformation grew more rapidly than the economies of Catholic countries and (2) this was a function of the value system of the Protestant cultures. Specifically, the core of the Protestant ethic was the belief that salvation would come not through adherence to church teachings but rather through divine grace; only some people would be saved, and no one could know for sure who that would be. But there were clues: each person, Weber thought, had a "calling"; and in order to be chosen, one had to perform assiduously the duties associated with one's calling. If one were a worker, one had to work very hard indeed; if one were an entrepreneur, one had to make a lot of money—which was not to be spent on worldly display but rather to be put back into the business.

McClelland's research on Achievement Motivation (1961) was essentially designed to test the hypothesis implicit in Weber's thesis—that is, that hardworking people are characterized by a particular set of values. In perhaps his most imaginative demonstration of the link between Protestant values and worldly achievement, McClelland compared the economic development of all countries in the temperate zones in 1950, defined in terms of electricity consumption; the average value for twelve Protestant countries (including Norway, Canada, and South Africa) was 1,983 kilowatt hours per capita; the average value for thirteen Catholic countries (including Austria, Chile, and Belgium) was 474 kilowatt hours per capita.

McClelland also developed a methodology for scoring Achievement Motivation from "fantasy" material. Using that methodology, he showed that a certain set of childrearing tactics could produce children with higher levels of Achievement Motivation. The overall effect is an interesting and impressive accomplishment; in our judgment, however, the bottom line for the purposes of this chapter is that Weber's original definition of the Protestant ethic—working hard and being successful—and McClelland's measure of the concept—Achievement Motivation—confound two distinct "values": hard work and financial or worldly success. Many hardworking people do not crave success, and many people who crave success are not hardworking.

Bray and Howard (1983) support the distinction between these themes. In a summary of the Management Progress Study at AT&T, they note that two motivational themes predicted managerial performance in that company. The first, called Need for Advancement, refers to the degree to which a person wants successively more demanding responsibilities. The second, called Work Standards, refers to the degree to which a person maintains high standards
for his or her performance. Need for Advancement roughly corresponds to the worldly success component of the Protestant ethic; Work Standards roughly corresponds to the hardworking component. Composite ratings for these two motive patterns are essentially uncorrelated. Ratings on these two variables have also been correlated with scales from various personality inventories. The highest correlation for the Need for Advancement ratings was \( r = .99 \) with the Ascendance scale of the Guilford-Martin Inventory of Factors (Martin, 1945) and \( r = .33 \) with the Dominance scale of the Edwards Personal Preference Schedule (EPPS; Edwards, 1959). The highest correlation with the Work Standards criterion was obtained with the Achievement scale of the EPPS.

Despite its label, "work ethic" includes somewhat different themes from those typically subsumed under the rubric of conscientiousness or emphasized in either the MPQ’s Constraint or the HPI’s Prudence scales. In each of these inventories, other scales appear more closely aligned with the folk notion of hard work. On the MPQ, the Achievement scale seems to approximate the central concepts of the work ethic. According to Tellegen (1982), the MPQ Achievement scale measures the degree to which a person works hard, helps with difficult and demanding tasks, persists where others give up, puts work and accomplishment before many other things, and sets high standards. Achievement is most strongly related to Well-Being (\( r = .33 \) males; \( r = .24 \) females) and Social Potency (\( r = .29 \) males and females) on the MPQ. Interestingly, it is slightly more highly correlated with the Control scale than are the other two scales that constitute the MPQ Constraint factor (\( r = .30 \) males; \( r = .20 \) females). The corresponding scale on the HPI is Ambition. That scale is composed of themes of competitiveness, energy, and achievement orientation, along with social assertiveness and self-assurance. It is more highly correlated with all of the other HPI scales than it is with Prudence (\( r = .28 \)). Its highest correlation is with Adjustment (\( r = .51 \)).

Gough’s effort to derive a measure of the Protestant ethic reinforces the notion that this folk concept is multidimensional and somewhat distinct from conscientiousness. Gough (1985) asked three experts to describe the Protestant ethic using his 300-item adjective checklist. The items that defined the Protestant ethic in the positive direction were industrious, loyal, patient, persevering, reasonable, responsible, sincere, stable, steady, and thrifty. Based solely on that sample of adjectives, the construct appears to overlap with conscientiousness, because a number of those adjectives also appear on Goldberg’s list (1992) of adjectives defining conscientiousness. However, Gough did not stop with a list of adjectives. He assigned a sample of men and women scores on the basis of their resemblance to the adjectival profile of the Protestant ethic. He then compared their CPI item responses with Protestant ethic scores. Additionally, he compared the CPI responses of a large sample of correctional officers with their job performance ratings. Finally, Gough composed a Work Orientation scale using items that were significant in both samples. The most interesting part of Gough’s analysis, in our view, is that scores on Work Orientation correlate more highly with measures of adjustment than with measures of conscientiousness. The highest correlations reported by Gough are with the Well-Being scale of the CPI (\( r = .84 \) for men; \( r = .85 \) for women), Emotional Stability on the Guilford-Zimmerman Temperament Survey (\( r = .78 \)), and (low) Anxiety Level on the Omnibus Personality Inventory (\( r = .78 \)). Work Orientation apparently includes themes of stability, responsibility, impulse control, conservative values, friendliness in dealing with others, and achievement orientation. This suggests, once again, that the folk notion of a work ethic confounds a number of individual attributes, most of which are relatively distinct from the core characteristics of the lexical dimension of conscientiousness.

These data suggest that the term “good work ethic” can be used to describe the attitude of people who work hard, do not complain, and seek out challenging assignments. Thus conscientiousness, in the sense of self-control and behavioral inhibition, is only part of one’s work ethic; in other words, persons with a good work ethic not only mind their manners but also persevere at difficult tasks and refrain from complaining about problems and reversals.

These data are relatively consistent with the hierarchy of motivational constructs discussed in the opening sections. Characteristics such as achievement orientation, adjustment, extraversion, ambition, and conscientiousness are at the highest level of the hierarchy. At lower levels, those qualities, individually or in combination, are labeled according to their impact and perceived value in the social group. Thus the work ethic is a configuration
of characteristics representing a prototype of the effective worker. It is the set of qualities that make up the ideal employee or co-worker in the popular mind.

These studies argue against the notion that conscientiousness is a universally valued work orientation. Instead, the data indicate that, while conscientiousness is a part of that orientation, ambition, energy, and a positive outlook account for a greater part of the variance in folk notions of worker effectiveness.

**Attitudes Toward Authority**

Attitudes toward authority are also part of what psychologists have labeled conscientiousness. As noted above, the HPI Prudence and MPQ Constraint scales each contain items concerning attitudes toward external rules and formal authority that are different from items reflecting caution, planfulness, and impulse control.

According to Tellegen and Waller (in press), the MPQ Traditionalism scale was developed to understand the relationship between the trio of conformity, conventionality, and authoritarian attitudes and other psychological constructs. Tellegen and Waller were influenced in the development of that scale by Sells, Demaree, and Will's analysis (1968) of some 600 items provided by Guilford and Cattell. From those 600 items, Sells et al. had identified a Conscientiousness factor marked by statements expressing "conforming, conventional, and moralistic attitudes." Tellegen and Waller noted that some of the Conscientiousness items concerned such authoritarian themes as respecting parental authority and advocating strict discipline and childrearing practices. Tellegen and Waller then adapted some of those items—along with others drawn from the F scale, as revised by Lee and Warr (1969), the Dogmatism scale (Rokeach, 1960), and Ernhart and Loewinger's measure of Authoritarian Family Ideology (Ernhart & Loewinger, 1969)—to form an initial item pool. Subsequent analyses confirmed that the items defined a distinct and replicable factor. The initial item pool evolved into the current MPQ Traditionalism scale.

Although Hogan did not set out to assess authoritarianism with the HPI, his efforts to sample the conscientiousness domain produced a similar subset of items. As noted earlier, the HPI Prudence scale can be decomposed into two subscales; one is an index of self-control, and the other reflects concern for traditional values and social appropriateness.

Attitudes toward authority may be an important future area of research for I/O psychology. As noted earlier, researchers have begun to study how raters evaluate their subordinates and coworkers. This represents a shift from thinking about performance appraisals as reports of ratees' behaviors to thinking about performance appraisals as reactions or responses to ratees' behavior. Terms such as "performance schemata" (Borman, 1987), "prototypes" (Foti & Lord, 1987), "cognitive categorization" (Mount & Thompson, 1987; Phillips, 1984), and "schematic information processing" (Phillips & Lord, 1982) are now used to describe the cognitive structures that raters use to make performance judgments. Studies by Borman (1974, 1987) and Werner (1994) are part of a growing literature examining the content of those cognitive structures. A consistent finding is that workers' attitudes toward rules and formal authority contribute a distinct dimension of evaluation.

Raters seem to recognize the interdependent nature of work and to value "cooperation, helpfulness, suggestions, gestures of goodwill, altruism, and other instances of what we might call citizenship behavior" (Smith, Organ, & Near, 1983, p. 653). Smith et al. (1983) interviewed a number of managers and asked them to "identify instances of helpful, but not absolutely required, job behavior" (p. 656). The instances were translated into sixteen items that were combined into a questionnaire. A second group of managers rated employees on those items according to how characteristic each statement was of the employee. Two factors emerged. The first, labeled Altruism, consisted of efforts to assist other people (as reflected in items such as "helps others who have been absent," "volunteers for things that are not required," "helps others who have heavy work loads"). The second factor concerned "a more impersonal form of conscientiousness that does not provide aid to any one person, but rather is indirectly helpful to others involved in the system. . . . The behavior . . . seems to represent something akin to compliance with internalized norms defining what a 'good employee ought to do'" (p. 657). The second factor, defined by such items as "punctuality," "attendance at work is above the norm," and "does not take unnecessary time off work," the authors labeled Generalized Compliance. Organ (1988) later
refers to this dimension as Conscientiousness. Although there is still some debate regarding the dimensionality of these “citizenship behaviors” (for example, MacKenzie, Podsakoff, & Fetter, 1991; Moorman & Blakely, 1992; Organ, 1988; Williams & Anderson, 1991), these two factors are relatively discrete and recurring themes that reflect attitudes toward co-workers and attitudes toward rules and authority.

Research on the outcome of vocational rehabilitation services also distinguishes between working hard and complying with rules and authority. The Minnesota Satisfactoriness Scales (MSS; Gibson, Weiss, Dawis, and Lofquist, 1970) are designed to assess the degree to which an employer is satisfied with a worker. A worker’s supervisors or peers compare the quality of that worker’s performance on a series of dimensions with other members of his or her work group (“not as well,” “about the same,” or “better”) or rate the frequency of certain behaviors relative to others (“less,” “about the same,” or “more”). Other items ask whether the rater would give the employee a pay raise or promote him or her to a position of greater responsibility. The final item asks for an overall appraisal of the employee’s performance, in comparison to others doing the same work; the rater is asked to indicate in which quarter of the overall distribution the employee would fall. The content of the scales anticipates the current interest in “citizenship” or “extra-role” behaviors in the workplace (for example, Organ, 1988; Werner, 1994). In addition to items rating quality and quantity of task performance, the form includes ratings of absenteeism, lateness, adherence to rules and regulations, and the quality of the worker’s relationship with both supervisors and co-workers. Gibson et al. (1970) conclude that the instrument assesses four factors: Performance (task performance, suitability for positions of greater responsibility, and an overall high rating relative to the worker’s peers), Conformance (adherence to standard work rules and procedures and acceptance of the supervisor’s authority), Dependability (the absence of discipline-invoking actions, lateness, or absenteeism), and Personal Adjustment (negative emotionality, fatigue, and unusual or bizarre behavior at work). Thus employee satisfactoriness is multidimensional; ratings on various aspects of work-related behavior are clearly distinguishable from ratings on the performance of specific tasks as well as overall appraisals of worker satisfactoriness.

Of these various facets of employee satisfactoriness, the Conformance and Dependability factors are most clearly related to conscientiousness. Measures of conscientiousness consistently predict a wide variety of negative work outcomes: absenteeism, alcohol and drug use, rule breaking, disciplinary actions, and other delinquency criteria (compare J. Hogan & Ones, in press; Hough, Eaton, Dunnette, Karp, & Cloy, 1990; Karp & Hough, 1988; McPherson, Hough, Toquam, Hanson, and Ashworth, 1990; Potter & Blake, 1994). The ability of conscientiousness measures to predict objective indices of worker performance or productivity or to assess supervisors’ or co-workers’ judgments of employee satisfactoriness is less clear (compare Hough, 1992). To begin to understand the possible reasons for the inconsistency of results in these areas, we need to consider an earlier body of work.

Social scientists have been interested in attitudes toward authority since the late nineteenth century; virtually every major social theorist (for example, Durkheim, Piaget, G. H. Mead, Freud) has noted that the most important psychological transformation during human development takes place when children accommodate to adult authority. Subsequent transformations of other sorts are possible and necessary, but each child must first learn a sense of duty and obligation to the laws, norms, and precepts of his or her society, all of which are reflected in the rules, values, and standards of his or her family.

Freud devoted more attention to this issue than the others—the problem of authority is the fundamental issue in psychoanalysis. In psychoanalytic theory, persons with well-developed superegos have positive attitudes toward authority; indeed, as adults (and prior to undergoing analysis), their attitudes toward authority are too positive. As a result, such persons are often guilt-ridden, rigid, and self-critical, and (although they are utterly dependable organizational citizens) their obsessive self-recriminations leave them joyless and exhausted.

Much of the subsequent research concerning attitudes toward authority has acknowledged its positive and negative aspects (Adorno, Frenkel-Brunswik, Levinson, & Sanford, 1950). Modern research on conscientiousness also suggests two well-established points: first, valid measures of conscientiousness index attitudes toward authority; second, these measures predict a wide variety of work outcomes associated with rule adherence and self-control. We
in the field of I/O psychology have tended, however, to assume that dependability is important regardless of the occupational setting, and we ignore the negative aspects of conformity. Although there are environments in which conscientiousness is valued, there are other environments in which it is not. Conscientiousness is negatively correlated with creativity (Barron, 1965), for example, so that high conscientiousness may be counterproductive in art, music, poetry, dance, or architecture—in short, in any job that requires flexibility, spontaneity, and a willingness to depart from established and approved ways of doing things. Nor is the impact of conscientiousness relevant solely to individual creativity. In the context of small work teams, Morrison (1993) found that when a task requires solving open-ended problems, teams that lack a member with low conscientiousness scores are unable to provide any adequate solutions.

Holland’s Environmental Taxonomy
Parsons (1909) developed the conceptual model that has guided most vocational psychologists during this century. He described a three-step process for choosing a vocation. In order to make an effective decision regarding a career, an individual needs the following: “(1) a clear understanding of himself, his aptitudes, abilities, interests, ambitions, resources, limitations, and their causes; (2) knowledge of the requirements and conditions of success, advantages and disadvantages, compensation, opportunities, and prospects in different lines of work; and (3) true reasoning on the relations of these two groups of facts” (p. 5). In short, Parsons proposed that vocational adjustment depends on the characteristics of both the individual and his or her environment. Holland appreciates this perspective and understands that, in attempts to facilitate vocational adjustment, information about personality must be supplemented by information on the kinds of environments in which each personality type will flourish. Therefore, in addition to describing six personality prototypes, Holland (1985) provides a corresponding classification system designed to predict “the outcome of pairing people and environments” (p. 34). His typology of work environments parallels his typology of persons. According to Holland (1985), “[W]e can predict what will happen when a particular person is put into a particular environment by characterizing the person and his or her environment in terms of the types and models and reviewing the appropriate formulations in order to discover the congruities and incongruities the models suggest. For example, the interaction of a Conventional type and a Conventional environment should produce a number of desirable outcomes, such as work satisfaction, achievement, and vocational stability” (pp. 34–35).

We earlier noted that conscientiousness distinguishes Artistic and Conventional people in Holland’s scheme. As was seen in the earlier list, Holland (1985) describes Artistic persons as “complicated, disorderly, emotional, expressive, idealistic, imaginative, impractical, impulsive, independent, introspective, intuitive, non-conforming, original, sensitive, open” (p. 21). In contrast, Conventional persons are likely to be “careful, conforming, conscientious, defensive, efficient, inflexible, inhibited, methodical, obedient, orderly, persistent, practical, prudent, thrifty, unimaginative” (p. 23). Based on Holland’s classification of work environments, therefore, highly conscientious individuals will select Conventional work environments, because such environments demand, support, and/or reward the qualities associated with that trait. According to Holland (1985), the Conventional environment “encourages people to see themselves as conforming, orderly, nonartistic” and to “see the world in conventional, stereotyped, constricted, simple, dependent ways.” Holland also suggests that Conventional environments “reward people for the display of conventional values: money, dependability, and conformity” (p. 40). Conversely, according to Holland, low-conscientiousness people tend to select an Artistic work environment that “encourages people to see themselves as expressive, original, intuitive, nonconforming, independent” and to “see the world in complex, independent, unconventional, and flexible ways” (p. 38).

Scores on conscientiousness measures obtained from samples of persons in various occupations classified according to Holland’s scheme are consistent with his predictions. J. Hogan and R. Hogan (1993) examined the mean scores on the HPI Prudence scale for six occupational samples. Using Gottfredson, Holland, and Ogawa’s classification system (1982), they identified archival samples that represented each type. The occupations were as follows:
steel-mill workers (R), physicians (I), musicians (A), food-service directors (S), sales representatives (E), and accounting clerks (C).

Table 3.3 presents mean scale scores, standard deviations, and percentiles for the HPI Prudence scale by occupational group. Accounting clerks received the highest mean score (80th percentile), and musicians received the lowest (25th percentile). For the other occupational groups, mean Prudence scores decreased along the axis from Conventional to Artistic across the hexagon. Differences among the groups were statistically significant. Similar findings occur when mean scores on other conscientiousness measures are compared for occupational samples (compare Gough, 1987; Myers & McCaulley, 1985); members of occupations classified as Conventional and Enterprising by Holland consistently produce relatively higher mean scores on conscientiousness measures than do members of occupations classified as Artistic, Investigative, or Social.

Gottfredson et al.'s (1982) classification of jobs from the Dictionary of Occupational Titles (DOT; U.S. Department of Labor, 1979) into the Holland taxonomy reveals large differences in the frequency with which the six types occur in the U.S. economy. Of the 12,099 occupational titles classified by Gottfredson et al., the greatest number were classified as Realistic (66.7 percent). The next most frequently assigned categories were Conventional (13.4 percent) and Enterprising (11.1 percent). Artistic environments were rare, accounting for only 1.2 percent of the occupations classified. When high-conscientiousness people choose Artistic environments or low-conscientiousness people choose Conventional work environments, the outcome is usually negative. Because there are more Conventional than Artistic occupations, the latter situation will occur much more often.

This breakdown of the frequency of the various occupational types suggests that most I/O research involves persons in Realistic, Enterprising, or Conventional environments—and with predictable results: most of those studies find correlations between low scores in the area of conscientiousness and ineffective job performance. J. Hogan and R. Hogan (1995) studied attrition in the Navy's rigorous training school for Explosive Ordnance Disposal (EOD) divers. These divers dismantle live bombs and warheads underwater. It is an unusually dangerous job, and the attrition rate at the EOD school at the time of the study was about 50 percent. The study revealed that the attrition was largely accounted for by persons with Artistic interests. Dismantling bombs and other ammunition requires following a set of procedures exactly; there is little opportunity for creative self-expression. Similarly, in a study of police officers, J. A. Johnson and R. Hogan (1981) showed that Artistic types are overrepresented among officers who are disliked by their superiors and the public they are supposed to serve—again, it would seem, because the job requires close adherence to a set of prescribed procedures. We likewise suspect that many cases of stress and burnout among air traffic controllers and nuclear power plant operators reflect similar dynamics: Artistic types, needing work but

<table>
<thead>
<tr>
<th>Occupational Title/Holland Code</th>
<th>HPI Prudence Scale Mean SD Percentile</th>
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<tbody>
<tr>
<td>Steel-Mill Laborers/REI (n = 66)</td>
<td>21.88 4.02 64 percent</td>
</tr>
<tr>
<td>Physicians/ISR (n = 19)</td>
<td>20.10 2.95 47 percent</td>
</tr>
<tr>
<td>Musicians/ASI (n = 40)</td>
<td>16.90 4.71 25 percent</td>
</tr>
<tr>
<td>Food-Service Directors/SEC (n = 422)</td>
<td>20.03 4.07 47 percent</td>
</tr>
<tr>
<td>Sales Representatives/ESR (n = 53)</td>
<td>20.14 4.14 47 percent</td>
</tr>
<tr>
<td>Accounting Clerks/CSE (n = 45)</td>
<td>24.31 3.57 80 percent</td>
</tr>
</tbody>
</table>

VOCATIONAL INTERESTS 127
faced with a job market that contains primarily Realistic, Conventional, and Enterprising work environments, take jobs that are composed largely of vigilance tasks. These Artistic types may have pursued jobs that seemed to promise autonomy, variety, and stimulation only to find themselves performing structured and highly routinized tasks. The mismatch between their needs, values, and capabilities and the demands of inflexible jobs often leads to personal dissatisfaction and unsatisfactory performance.

J. Hogan and R. Hogan (1993) note that they know of “no studies that evaluate the relationship between conscientiousness and effective performance in Artistic or Investigative jobs” (p. 15). They report data obtained from a sample of orchestral musicians: correlations between the Prudence scale of the HPI and peer ratings of musical talent ranged from −.25 to −.40; lower Prudence scores were consistently associated with higher peer evaluations of musical talent. Hogan and Hogan conclude that the importance of conscientiousness depends on the requirements of each occupational context. They suggest that the attributes characterizing individuals high on conscientiousness (for example, “rule compliance, orderliness, carefulness, and attention to detail”) are assets in Conventional environments but may “inhibit the innovation, flexibility, ideational fluency, and originality” required in Artistic environments (pp. 16–17).

As noted above, however, both Schneider and Holland suggest that differences in organizational (or occupational) climate reflect the differences in the people who work in the organizations. Schneider’s thesis is that organizations attract, select, and retain particular kinds of individuals and that the climate of the organization is a function of the kind of people it has retained. The ratings observed in Hogan and Hogan’s Artistic environment may therefore reflect peculiarities of that population as much as the nature of the particular work tasks being rated. It is conceivable that low-conscientiousness raters use different criteria to judge the satisfactoriness of their colleagues. Thus low-conscientiousness people may not be better musicians; rather, they may merely be regarded more favorably by others who are themselves low on conscientiousness.

At one of the nation’s military academies, Blake (1994) tested the hypothesis that high- and low-conscientiousness raters have different views of what an “ideal” co-worker or subordinate is and therefore use different criteria to evaluate overall satisfactoriness. The military academy features a peer rating system that includes (1) a number of individuals performing essentially the same work tasks and subject to the same job requirements, (2) personality information for both raters and ratees, and (3) multiple raters, thereby allowing direct comparison of Interrater differences in the evaluation of the same individual(s). Further, the military academy is a highly structured environment with complex and extensive systems of rules and carefully defined lines of authority. Because the system of regulations is so heavily emphasized, it may be inferred that rule-adhering behavior should be highly valued; it is likewise easy to show that military academies are Conventional environments in Holland’s taxonomic scheme.

Ratings on six satisfactoriness dimensions (Conformance, Dependability, Altruism, General Adjustment, Emotional Stability, and Task Performance) taken from a modified form of the Minnesota Satisfactoriness Scales (Gibson et al., 1970), along with an overall satisfactoriness rating, were collected from students’ peers. Two sets of average satisfactoriness facet ratings and overall satisfactoriness ratings were calculated for each ratee—one based on his or her high-conscientiousness peers and the other based on low-conscientiousness peers. Blake found distinctly different rating policies in the two groups. The raters within each group, however, held similar views of their peers; their ratings on each of the satisfactoriness dimensions were highly similar. For example, the average ratings on Conformance and Dependability for the two groups correlated $r = .87$ and $.83$, respectively. However, the groups differed significantly on the degree to which ratings on those dimensions were associated with an overall appraisal of their peers. For the high-conscientiousness raters, ratings on the Conformance and Dependability dimensions were highly correlated with overall performance ratings ($r = .80$ and $.70$, respectively). For the low-conscientiousness raters, the correlations of those dimensions with the ratees’ overall rank fell to $r = .37$ for Conformance and $r = .19$ for Dependability. Even in the highly structured and regimented environment of a military academy, raters differed significantly in the degree to which they valued conformance to authority and adherence to rules and standard procedures. Nor were the
differences random. Instead, “they appear to reflect systematic differences in the value systems of raters—differences that covary with the raters’ own standing on the conscientiousness dimension” (Blake, 1994, p. 16).

The implications of these data are significant. If one wants to predict counterproductive work behavior (for example, absenteeism, tardiness, and discipline-invoking actions), then conscientiousness is important. If, however, one wishes to predict a broader range of outcomes, including how an individual is likely to be evaluated by his or her co-workers, then we need to know something about those co-workers.

Final Comments

We have thus come full circle, returning to the perspective that has guided most vocational interest research. The field of vocational interest measurement reflects a perspective on the individual in the world of work that is quite different from that in I/O psychology. Vocational psychologists are generally concerned with providing services to individuals; they help individuals move into compatible work environments. That involves helping a single individual choose from among an array of employment options and matching individual differences to characteristics of occupations.

The nature of vocational counseling has necessitated comparing and classifying work environments. Holland’s taxonomy is one example of how vocational psychologists have developed psychologically meaningful taxonomies of work environments (compare Borgen, Weiss, Tinsley, Dawis, & Lofquist, 1968; Dawis, Dohm, Lofquist, Charrand, & Due, 1987; Rosen, Weiss, Hendel, Dawis, & Lofquist, 1972). Industrial/organizational psychology has yet to avail itself of much of this work. Nevertheless, the advantages of these taxonomic schemes for researchers undertaking meta-analyses in order to uncover important relationships between individual differences and important work outcomes should be obvious.

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