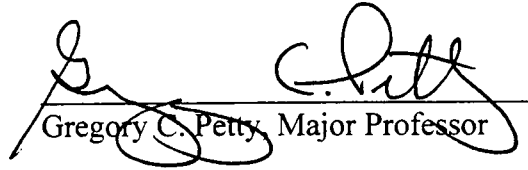
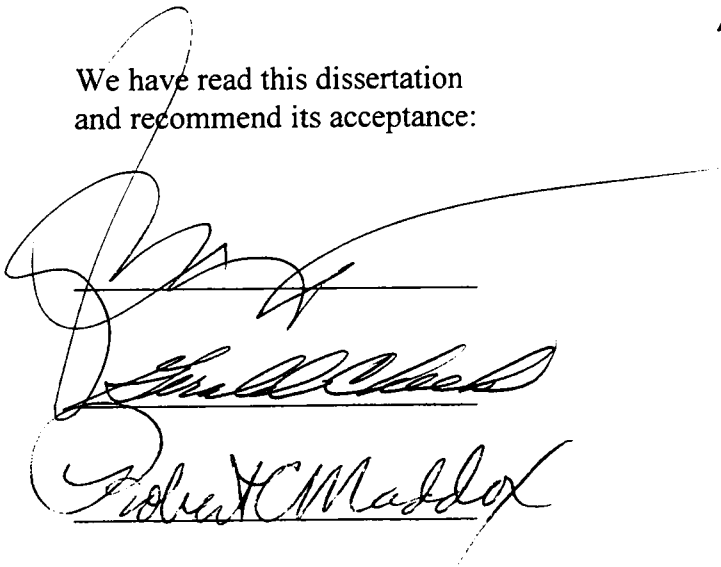


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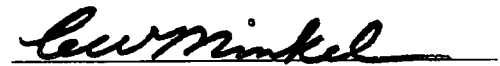
I am submitting herewith a dissertation written by Max B. Dawson entitled "A Construct Validity Assessment of The Occupational Work Ethic Inventory." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Education.


Gregory C. Petty, Major Professor

We have read this dissertation
and recommend its acceptance:



Accepted for the Council:


Associate Vice Chancellor and
Dean of The Graduate School

**A Construct Validity Assessment of the
Occupational Work Ethic Inventory**

A Dissertation

Presented for the

Doctor Of Philosophy

Degree

The University of Tennessee, Knoxville

Max Dawson

May, 1999

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I want to thank Dr. Gregory C. Petty, whose life is reflected in this work. The focus of this study, The Occupational Work Ethic Inventory, is of his design. His research into this important area has been of benefit to those interested in workforce development, not only from the perspective of knowledge and skills acquisition, but also that of attitudinal disposition. But perhaps more importantly, his lifestyle reflects the kind of robust work ethic that is needed to succeed in society. Your encouragement and guidance have meant a great deal to me.

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ABSTRACT

Despite the proclivity of research which has been undertaken to expand our knowledge of what is generically called work ethics, utilizing various experimental and otherwise inferential designs, little effort has been expended in examining the construct validity of the instruments used to assess level(s) of work ethic. The purpose of this investigation was to compare the scores of a large sample of individuals on two work ethic scales. Scores from The Protestant Ethic Scale (Mirels & Garrett, 1971), a commonly used and validated instrument, were compared to those of the Occupational Work Ethic Inventory (Petty, 1995).

A correlational and factor analytic study of scores obtained from a usable sample of 841 participants was undertaken. A Pearson bivariate correlation was not found to be significant. A factor analysis of the PE Scale revealed five significant factors. A factor analysis of the OWEI revealed eight significant factors.

Because of the thoroughness of the underlying researched used to develop the OWEI, and in conjunction with other rationales, it was decided that post hoc analyses were warranted. Utilizing structural equations modeling methodology, various iterations of the OWEI were examined for goodness-of-fit to the data set. A model was found which conformed to the sample utilized in the study. This model consisted of fifteen of the original fifty OWEI items, which were grouped into four factors.

Caveats as to the appropriateness of this procedure were made in the thesis, especially in the areas of sample and replication efforts. Further research in construct validity of work ethic scales was also encouraged.

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Chapter I

INTRODUCTION

The meaning and value of work has, for the most part, been consistent with societal needs and economic demands. Hard work, diligence, and industry would be rewarded; either because of a belief that one was fulfilling his "daily calling" to God, or because of a belief that labor is important because it produces wealth. The above two value statements are but a couple of a myriad that one may either espouse or reject when applying meaning to the act of work. Work ethic may be defined simply as a general positive attitude about work, but of course other, more expansive definitions have been offered. Max Weber's (1904,1905) well-known phrase "the Protestant work ethic", as delineated in his famous work *The Protestant Work Ethic and the Spirit of Capitalism*, is assuredly the most well known. The ensuing debate, which has raged on for over eight decades, has increased in intensity as the meaning of work has changed for many, due not only to societal changes, but also to the transformations brought about by technology (Haynes, T, 1992).

Over 25 concepts/measures of worker commitment have been generated by researchers since 1956 (Morrow, 1983). Morrow (1983) cited some of the more commonly used forms of the definition and operationalization for worker commitment as: (1) the protestant work ethic (the belief that hard work is intrinsically good and an end in itself; Mirels and Garrett, 1971), (2) career salience (the importance of work and a career in one's total life; Greenhaus, 1971; Greenhaus and Simon, 1977), (3) job involvement (the degree of daily absorption an individual experiences in work activity; Lodahl and Kejner, 1965), (4) work as a central life interest (an individual's preferred locale for

carrying out activities; Dubin, 1956); Taveggia and Ziemba, 1978), and (5) organizational commitment (the extent to which an employee desires to remain in an organization, exerts effort on its behalf, and believes in and accepts the organization's values and goals; Mowday, Porter, & Steers (1979). In a facet analysis of work commitment, Morrow (1983) identified five forms of, or categories of, worker commitment, which she labeled: value focus, career focus, job focus, organizational focus and union focus. Morrow, in 1983 (p. 497), remarked that all of above mentioned measures involve some degree of concept redundancy; later, Morrow and McElroy (1986) concluded that it appeared that only the job and career categories of worker commitment are overlapped. Morrow, Eastman, and McElroy (1991) conclude that certain work commitment measures do exhibit varying levels of redundancy, with job involvement, career salience, and work as a central life interest being the more nebulous of the work commitment concepts.

In 1983 Morrow called for a moratorium on new commitment concepts until some evaluation of existing concepts had been completed. Her rationale was that basically researchers have elected to formulate their own definition and measure of work commitment than rely on some existing approach. She concluded that "...the likelihood of devising a single, unidimensional generic concept and measure is small" (Morrow, 1983, p. 497). A recommendation was that the redundancy of existing measures within each work focus category be eliminated, followed by the elimination of between-work-foci redundancy. A suggestion was rendered that a commitment index analogous to the Job Descriptive Index (Smith, Kendall, & Hulin, 1969) could possibly be formulated, which could better reflect different forms or facets of work commitment definitions.

Research of this type (i.e. on principal components or facets of work commitment) has been further refined by Furnham (1990a). Again, the fundamental conclusion was that work commitment measures must be multidimensional in scope, and that these measures should be shown to have not only concurrent but also predictive and constructive validity. Therefore, the primary focus of this study is to investigate the validity of this measure of work ethic, and to discuss the utility that may be derived from a positive assessment of its construct validity.

Statement of the Problem

A prevalent concern regards the ample amounts of substantive (as compared to construct validation) research, as delineated by Schwab (1980). Important substantive findings and conclusions of work ethic research using the Occupational Work Ethic Inventory (OWEI) have already been made. Much of this research has investigated demographic differences (Hill, 1993; Allender, 1993; Watson, 1993). Unfortunately, there have been few instances in which any work has been undertaken to assess the validity of the instrument, other than reports of internal consistency (i.e. reliability) (Hatcher, 1994; Hollingsworth, 1995), and one study which included factorial analysis to determine principal components (Hill & Petty, 1995).

The term validity in essence refers to the crucial relationship between a concept and its indicators (Carmines & Zeller, 1979). Internal consistency is regarded as being only one of five major components of construct validity. The four other components required to undergo a complete assessment would include: (a) content validity; (b) convergent validity; (c) discriminant validity; and (d) nomological validity (Venkatraman

& Grant, 1986). A literature review revealed no studies in which a convergent validity assessment was undertaken in order to compare the OWEI with other accepted work ethic instruments. In other words, we do not know at the present time if the findings of studies using the OWEI instrument can be compared with other studies, which have utilized other, "more valid" work ethic instruments ("more valid" in this case denotes instruments in which some of the above five components of construct validity have been positively assessed).

Purpose of the Study

The purpose of this study is to investigate the overall validity of the measure of the Protestant Work Ethic (PWE) as described by Petty's (1991a) Occupational Work Ethic Inventory (OWEI). Specifically, the focus of the study is to determine whether convergent validity between the OWEI and Mirels and Garrett's (1971) Protestant Ethic (PE) scale can be established. As will be delineated in the Review of Literature chapter of this thesis, the Protestant Ethic Scale was chosen for its preponderance in the literature base, and its similarities in theoretical assumptions as compared to those of the Occupational Work Ethic Inventory.

Rationale

Although there has been an exponential increase in work commitment research during the last 20 years, much work remains. For example, Furnham (1990a), in a major study comparing the seven most commonly utilized Protestant Work Ethic instruments, stated "It should be pointed out that all seven questionnaires yield a single score on a high-low dimension of belief in the PWE. Yet, there is considerable evidence to suggest

that the PWE is a multi-dimensional concept" (p.384). Morrow (1983), in an earlier important work, concluded that "...the likelihood of devising a single, unidimensional generic concept is small"(p. 497). Beside her suggestion of a conceptual reevaluation of work commitment, she recommends more rigorous construct validation efforts be undertaken, and that "All the forms of work commitment would profit from more empirical examination as dependent variables" (1983, p. 497). A review of the literature did not reveal any studies in which convergent validity for the OWEI was undertaken. In addition, no studies were found concerning construct validity at the macro level for this measure of work ethic. Hence, there exists two reasons for this study: (a) to attempt to provide evidence of validation for a multidimensional measure of work ethic, and (b) to provide veridical evidence for the substantive research findings which have previously utilized the OWEI.

At a more fundamentally pragmatic level, there are several reasons why a study of this type should be undertaken. There exists many examples of psychometric measures which have been utilized purposefully, and without modification, for many years. However, in most cases it could honestly be asserted that other instruments could be grouped into the class of "works in progress." Indeed, many measures undergo revision due to: critique of the measure in the literature; additional studies, which have revealed various weaknesses; and transformations in theory, which help to define what a construct is (and subsequently, its measure). The operationalization of the construct "work ethic", or "Protestant Work Ethic" must be able to withstand the various threats to construct validity.

Consequently, the practical rationale for this study is to improve the instrument. Any improvement(s) made will allow for better use in future studies. Possible application areas are for the improvement of curriculum, training, or various services for/by Human Resource Development (HRD) professionals (such as in selection).

Research Questions

There is primarily one question to be investigated in this study. Can evidence of convergent validity be found for the Occupational Work Ethic Inventory (OWEI). That is, does this concept measure of Protestant Work Ethic agree with the findings of another accepted work ethic measure to a high degree?

In addition to the primary question, ancillary objectives were to seek evidence for the other key components of construct validity as summarized by Venkatraman & Grant (1986). See **Definitions** section in Chapter I for descriptions of all five components. For instance, one component is internal consistency, which is subdivided into the components of unidimensionality and reliability. Almost all studies report some estimate of reliability for the measurement instrument utilized, even though the purpose of the study may have been predominantly substantive in nature. It is therefore proposed that data for the other components of construct validity may be gleaned from the literature base regarding the OWEI.

Definitions

Content Validity - The extent to which empirical measurement reflects a specific domain of content.

Internal Consistency

1. Unidimensionality - The extent to which the items included in the instrument reflect one underlying construct.

2. Reliability - The absence of measurement error in the cluster score for an instrument; i.e., no error (nonreliable) variance in scores is added. Thus it represents an estimate of generalizability of scores across parallel instrument forms.

Convergent Validity - The extent to which alternative measurements of the same construct share variance. In other words, it is the degree to which multiple attempts to measure the same concept with different methods are in agreement.

Discriminant Validity - Simply put, discriminant validity is the extent to which a concept differs from other concepts. For example, variables (or subscales, etc.) that are common to two different instruments purportedly designed to measure different constructs may covary when applied at the same time; this would be considered evidence of a problem with differentiation.

Nomological (Predictive) Validity - The degree to which predictions from a theoretical network are confirmed. That is, expected relationships between the concepts which make up the typology of the theory are confirmed by substantive research findings.

Work Ethic - The belief that hard work is intrinsically good and an end in itself (Mirels & Garrett, 1971).

Correlation - The degree of relative correspondence between two sets of data.

Validity - Strength or force (of a measurement instrument) from being supported by fact, justness, or soundness.

Construct Validity - A term which is used to describe the degree to which an instrument truly measures or represents its intended construct (conceptual definition of a variable).

A similar term is *epistemic correlation*.

Latent Variables - Abstract psychological concepts which are not directly measurable (e.g., "intelligence", "creativity" or "attitude").

Construct - A concept which has been invented or adapted for a special scientific purpose (e.g., "power" or "work").

Deficiency - Variance in the construct not captured by the measure.

Contamination - Variance in the measure not present in the construct.

Structural Equation Modeling (SEM) - A chiefly linear, cross-sectional statistical modeling technique. Also called structural modeling, analysis of covariant structures, or causal modeling.

Work Commitment - An overarching concept connoting the idea of devotion, loyalty, or commitment to work or work-related organizations (e.g., work ethic, career salience, organizational commitment).

Goodness-of-Fit Index (GFI) - A general term used for the resultant statistical figure derived from Structural Equation Modeling analysis, which indicates the degree of (empirical data) fit to a predetermined model.

Protestant Work Ethic - See definition for **work ethic**; with added underlying meaning attributable to Judeo-Christian moral beliefs. Often the terms are used interchangeably.

Assumptions

1. The utilization of the Protestant Ethic Scale (Mirels & Garrett, 1971) as a

comparison instrument entails the fundamental assumption that it is a valid assessment tool for gauging levels of work ethic beliefs for individuals at the time the study was undertaken.

2. The study assumed that the respondents understood and honestly and accurately reported the level of agreement among the various phrases and words used to describe work ethic as described by the two scales used.
3. Demographic variables such as socio-economics and ethnicity may influence work ethic beliefs; however, these variables were not controlled.

Delimitations

1. The sample of 841 respondents was based on a convenience sample, with "adult workers" being defined as those individuals who were 18 years of age or older, and who were either retired or were employed at least half-time. Individuals employed in various occupational classifications were included in the study, but no effort was made to stratify, or otherwise randomize the sample. Furthermore, data were collected from individuals living in eight southeastern states, including: North Carolina, South Carolina, Tennessee, Georgia, Florida, Alabama, Virginia, and Kentucky.
2. The evaluation of work ethic was limited to the value-oriented definition of work ethic as described by The Occupational Work Ethic Inventory (Petty, 1991) and the Protestant Ethic Scale (Mirels & Garrett, 1971), which defines work ethic as the belief that hard work is of intrinsic value and is an end in itself. This excludes other rated ethics, such as leisure ethic, consumer ethic, or other work ethic

concepts.

3. The characteristics of work ethic are also delimited to the those 19 items of the PE Scale and the 50 items of the OWEI.

Organization of the study

The organization of the study is as follows. Chapter I introduces the problem and rationale for investigating the construct validity of the Occupational Work Ethic Inventory (Petty, 1995b). Chapter II discusses issues pertaining to construct validity assessment. A review of the literature base on work ethic research, with a focus on work ethic scales is included as well. Chapter III, Methods and Procedures, will provide only the particular methods and procedures to be utilized in this study to meet the objectives of construct validation as elaborated in Chapter I, in the Purpose of the Study section. Chapter IV is a review of the statistical analysis of the fundamental comparison of the two scales via Pearson correlations and factor analyses. Chapter V is a review of post hoc analyses undertaken to gain further insight into the construct validity of the OWEI (Petty, 1995b). And last, Chapter VI includes an overall summary, findings, conclusions, and recommendations for further research.

CHAPTER II

A DISCUSSION ON CONSTRUCT VALIDITY AND REVIEW OF RELATED LITERATURE AND RESEARCH

This chapter contains a review of literature and related research pertaining to work ethics. A general discussion on the topic of construct validity will also be included in this chapter. The section on construct validity is largely tutorial in nature.

A Discussion Related to Construct Validity

As discussed by Schwab (1980), research investigations may be fundamentally divided into two groups. The first group delves into issues related to independent and dependent variables, correlations, and examinations of covariation between measures of *different* constructs. This type of research may be labeled *substantive*. The second type of research focuses on issues involving the relationship between the results of a measure, and the actual construct or concept which it purports to assess. Studies of this type may be classified as *construct validation* research. The discussion which follows is essentially a brief overview of construct validity, with a focus on issues related to psychometric measures and their attendant constructs. Although construct validity is generally considered with reference to measuring scales or instruments in psychological tests, experimental or quasi-experimental manipulations can (could) benefit from an evaluation of the issues involved when considering construct validity (Schwab, 1980, p. 5). Interested readers are strongly encouraged to find elaboration in the work of Schwab (1980), Nunnally (1978), Bagozzi (1980), Lawshe (1975) and others. It should be noted

that definitions for many of the terms to be discussed here appear in the **Definitions** section of Chapter I.

Perhaps the best place to begin would be to define what a construct is; this author appreciates the words of Kerlinger:

A concept is a word that expresses an abstraction formed by generalization from particulars. *A construct* is a concept. It has the added meaning, however, of having been deliberately and consciously invented or adopted for a special scientific purpose. (1973, p.31-32).

Validity

Validity refers to the crucial relationship between a concept and its indicators (Carmines & Zeller, 1979). Other labels for this relationship are *epistemic correlation* (Northrop, 1959) or *relevancy* (Nagle, 1953, p. 274). The term correlation is used by these and other authors in their definitions of this term. The idea being tendered is that one may represent this relationship as being the hypothetical correlation between the criterion used (measure) and the ultimate criterion (construct). Schwab, citing Nunnally (1978), states that the main danger of this line of reasoning is the problem of regarding a construct as being real; a construct is, after all, nothing more than a mental definition of variable. According to Schwab (1980, p.7), an associated danger of the correlational analogy, according to Schwab, is to consider the processes used to assess validity as being necessarily the same as this correlation between the measure and the construct itself.

Schwab (1980) explained that the methods to assess validity are dependent on

which of two basic types of *substantive research* (again, this being the investigation of relationships between measures of different constructs) is being undertaken. One orientation he called scientific, the other applied. The first pertained to research in which the importance of a construct is its inherent relationship with another construct. If a measure of a construct cannot be shown to relate to another (assumed valid) measure of another construct, then a modification of either the suspect measure, the definition of the construct that it purported represents, or a change in the theory linking constructs together must take place (or, of course, the constructs, etc. may be abandoned). A visualization aid provided by Schwab is reproduced in Figure 1. Note that this figure indicates the linkages for the simplest form of a scientific research question, namely between one independent variable and one dependent variable. In scientific research variables are defined, that is, they are created, and empirical measures or indicators are also defined (created) in order to test linkages between them. The fundamental test usually takes the form of varying an independent variable (i.e., I) in order to see how a dependent variable (i.e., D) may change or covary. This is represented by the equation $D = f(I)$. The vertical linkages (II' and DD') in Figure 1 represent construct validity, while the horizontal linkages (ID and I'D') constitute substantive research linkages. Note that one can only manipulate or observe what are labeled I' and D' in Figure 1. These represent operational or empirical variables. However, when making inferences concerning their covariation (i.e., at the operational level), the result is commonly transferred to the construct level. It should be readily apparent, even without detailed explanation, this

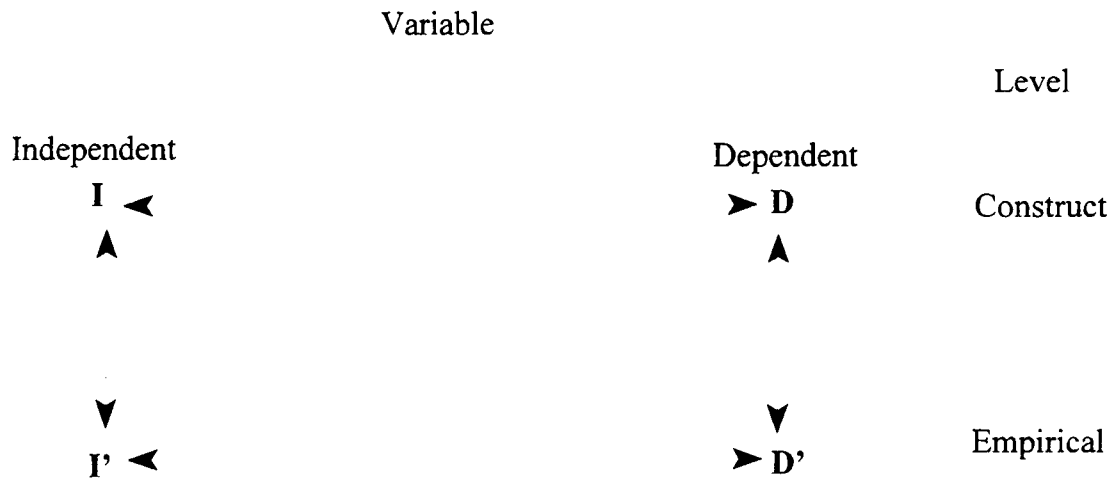


Figure 1. Representation of Construct and Empirical Validity

Source: Schwab, D. (1980). Construct validity in organizational behavior. Research in Organizational Behavior: Vol. 4. JAI Press, p.7.

can lead to difficulties. The results obtained from the I' operation must correspond to our way of thinking about I, and the results of the D' operation (or empirical measurement) must correspond to our way of thinking about D. If an experiment is conducted, and it is found that I'D' are positively correlated, then it is essential that II' and DD' are correlated. However, it must be remembered that both I and D are conceptual, they are created by human imagination, and are therefore not amenable to direct observation or measurement. The difficulty is further exacerbated in that the conceptual variables (I and D) may be ill-defined, and not subject to accurate measurement in any instance. Departures of this type in construct validity are called either *contamination* (variance in the measure not present in the construct) or *deficiency* (variance in the construct not captured by the measure).

Often a researcher is more interested in predicting changes in a dependent variable; and not overly concerned with theoretical linkages. This approach to substantive research is called an applied orientation by Schwab (1980). A common example would be some sort of selection test used by personnel at a company to predict future work performance (e.g. a math test for a machinist position). Figure 2 represents the issues to be considered when this sort of research is being undertaken. The difference between this approach and that of the scientific type is the importance of being certain that the DD' relationship is fairly strong. One may not be concerned with what I' (the predicting measure) represents in the scheme of things, as long as it can be shown to consistently predict D (the dependent construct represented by D'). If the correlation between I'D' is known (this can be calculated), then the hypothetical correlation of I'D

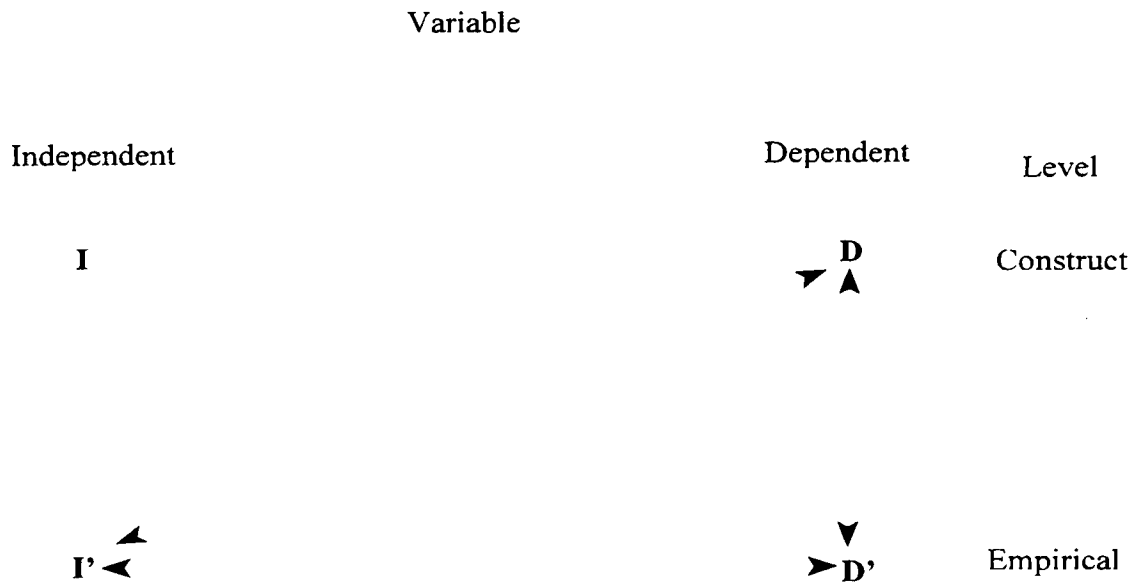


Figure 2 Illustration of Applied Prediction Design

Source: Schwab, D. (1980). Construct validity in organizational behavior. Research in Organizational Behavior: Vol. 4. JAI Press.p.9.

may be calculated using McNemar's (1969, p.185) formula:

$$r_{I'D} = r_{I'D} \cdot r_{DD'} \pm \sqrt{1 - r_{I'D'}^2 - r_{DD'}^2 + (r_{I'D'}^2 \cdot r_{DD'}^2)}$$

This formula was used to construct the correlational limits for $r_{I'D}$ for the illustrative construct ($r_{DD'}$) and empirical ($r_{I'D'}$) validities shown in Table 1. Note that the range of the I'D correlation coefficients is substantial for all instances, but especially when the construct validity ($r_{DD'}$) departs from any figure less than 1.0.

Another difference between the scientific and applied orientations to construct validity is the matter of how constructs are modified. The process of construct validation for the scientific orientation is typically sequential and interactive, as shown in Figure 3. A construct is initially defined (C), a measurement is conceived of for it (C'), and finally, adjustments are made to the definition of the construct ($\hat{C}$). (Of course, this process also includes an interactive modification of the measure (C') to some other form (say, C'')). This modification scenario is often not feasible in applied settings due to the fact the dependent construct is established normatively, i.e., through some persons or organization. Its' (the construct represented by the dependent variable, D) relationship with another variable (an independent one in this illustrative example, I) is of less concern; D in this case is fixed. To clarify, consider the preceding example concerning a performance measure for a machinist position. If a math test is the common method used for screening potential candidates for performance ability, then any independent variable that may be used to improve performance must improve math scores. In the applied plane, this construct may be deemed the *ultimate criterion* (Thorndike, 1949), and all effort must be expended in making the measure conform to the construct (Nagle, 1953).

Table 1. Range of I'D Correlation for Observed I'D' and Hypothetical DD' Correlation

Coefficients

I'D'			
'DD'	.20	.40	.60
.99	.00 - .39	.27 - .53	.48 - .71
.95	-.12 - .50	.10 - .66	.33 - .81
.90	.25 - .61	.04 - .76	.19 - .89
.80	.43 - .75	.23 - .87	.06 - 1.00

Source: Schwab, D. (1980). Construct validity in organizational behavior. Research in Organizational Behavior: Vol. 4. JAI Press.p.9.

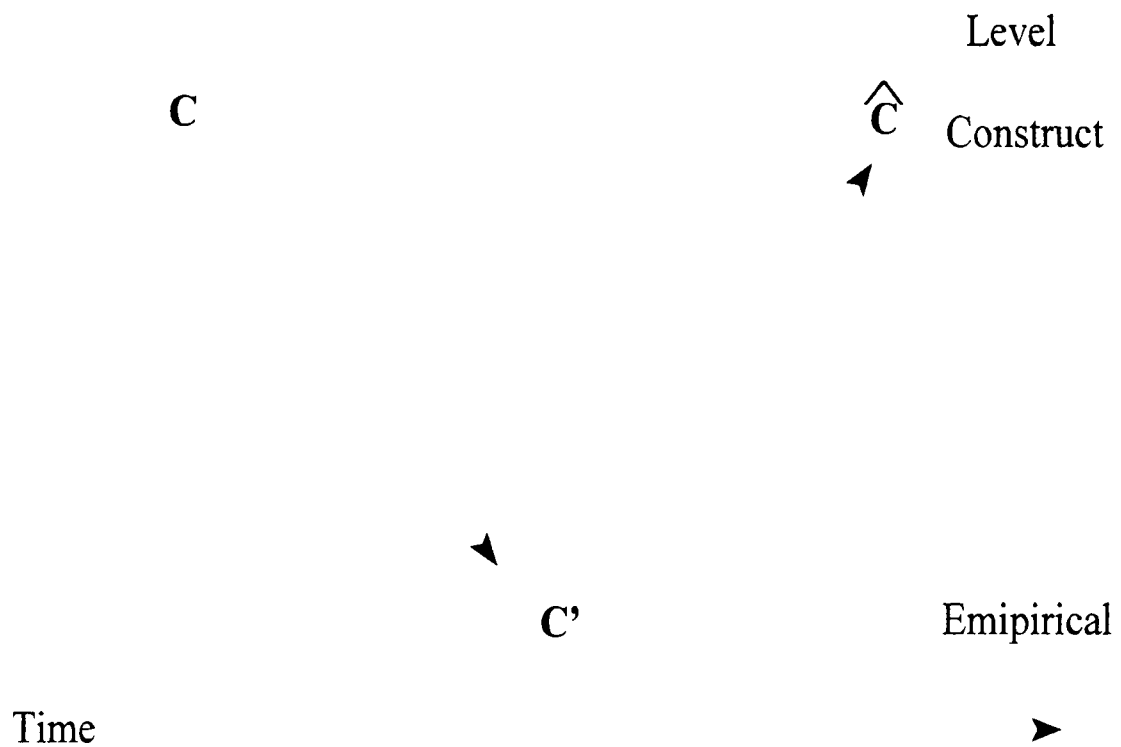


Figure 3 An Illustration of Construct Validation as a Sequential Validation Process

Source: Schwab, D. (1980). Construct validity in organizational behavior. Research in Organizational Behavior: Vol. 4. JAI Press. p.10.

The above discussion probably overstates the construct validity process as it is typically implemented. Constructs may be defined, and measures developed, with various degrees of regard to construct validity. Promising theoretical relationships may spur researchers to consider the use of little-tested measures in substantive research. Although some benefit may be derived from this tactic, it apparently has become an debatable issue of late, as writers in the fields of sociology (Blalock, 1968), psychology (Lawshe, 1975; Nunnally, 1978) and management (Venkatrman & Grant, 1986; Schwab, 1980; Morrow, Eastman, & McElroy, 1991) have indicated.

Assessing Construct Validity

In the preceding section construct validity was introduced. In the present section a brief exposition of methods for assessing the construct validity of a measuring instrument will be reviewed. The issues considered here are complex due to the fact that the variable of concern--the construct--cannot be directly assessed empirically. Other difficulties arise during the selection of appropriate procedures for the validation process; scientific (i.e., the search for relationships) and applied (i.e., the dependent construct assumes priority) orientations differ in requirements. Hypothetical construct linkages that one variable may have with another are also important. And, of course, the most important consideration of all is the fact that any test(s) at best can serve only to "...to state... the degree of validity the [measure] is presumed to have" (Cronbach & Meehl, 1955, p. 290).

The roles of definition and theory are crucial conceptual issues in construct validation. The need to develop a valid operational measurement is highly dependent on the definition of the construct itself. The definition should specify the nature of the

construct, including, besides the basic meaning to be attributed to it, the variances that should or should not be included with it. Although a construct may be operationalized by many different schemes (e.g., questionnaires, interviews, participant observation, analysis of secondary data, or in-depth case analysis), the issue of assessing and establishing validity of operationalization remains fundamental to the interpretation of substantive relationships (Venkatraman & Grant, 1986, p. 72). Various psychometric properties, such as the stability of the construct, and its dimensionality are important concerns as well. If a construct has been defined from a normative perspective (i.e. by others) the role of definition is limited to a specification of what is included in the construct domain and the probable psychometric properties of its measurement. But if the construct is defined for scientific purposes the role of theory becomes important as well. Probable hypothetical linkages between the construct of interest and measures of other constructs is important for two reasons. First, specifying interconstruct linkages can provide clarification of the construct under consideration (i.e., help to define it). This is accomplished by examining similar constructs and any attendant theories which may utilize them. Simultaneous comparison will often reveal what Cronbach & Meehl (1955) call the *nomological network*, which indicates possible connections and conceptual foci. Secondly, the nomological net and/or personal theories may serve as aids in establishing construct validation procedures.

There are many psychometric procedures that are so commonly used that a brief review is warranted here. Venkatraman & Grant (1986) identify five commonly recognized components of validity (see **Definitions** section in Chapter I for meanings):

(a) content validity; (b) internal consistency, which subsumes unidimensionality and reliability; (c) convergent validity; (d) discriminant validity; and (e) nomological/predictive validity. Schwab (1980) essentially divided these items into two groups; those dealing primarily with measures or manipulations of the construct under consideration (focal construct), and those dealing with measures of the focal construct and alternative constructs (theories; relationships among constructs).

Almost all investigations regarding validity of a measure begin with some estimate of its reliability. Reliability may be defined as the ratio of true variance to total variance:

$$Reliability, r_{11} = \frac{\sigma_t^2}{\sigma^2}$$

True variance, σ_t^2 is defined as defined as systematic variance. Total variance is comprised of both true variance and *error variance*, which is chance variance. Error variance is the sum effect of the chance differences between persons that arise from factors associated with a particular measurement. Examples might include wording of the test, the person's mood on the day the test was taken, the ordering of the test items, or the content that was used (Borg & Gall, 1983, p. 283). The items comprising an instrument are considered a sample from a much larger domain of items that could be included (Schwab, 1980). Because of this, indices of internal consistency or estimates of generalizability have been developed in order to assess the correspondence of a measurement to a parallel form of measurement (where time is not assumed to be an error

source) (Campbell, 1976).

Cronbach's alpha, Kuder-Richardson-20, and the Spearman-Brown Rho prophecy formula are all examples of this hypothetical correlation. Furthermore, other sources of error variance may come into play. One is *interobserver reliability*, and the other is *stability* over time. Interobserver reliability is a prominent obstacle to establishing *content validity* (which should not be confused with *face validity*, which is a subjective judgement that the test *appears* to cover relevant content). Content validity is determined through a systematic set of operations, wherein the content universe is defined, and the objectives of the measurement procedure and how the content universe will be sampled to develop test items, are taken into consideration. Content validity is particularly important in the applied orientation to construct validity previously discussed (e.g., in achievement testing and various tests of skills and proficiency), because the items covered on the test must match (be representative) of the content (of the [dependent] construct). Although content validity is not usually expressed in numerical terms (an objective, qualitative measure is effected), Lawshe (1975) has developed a quantitative approach with which a content validity ratio may be calculated.

The other common source of error variance, stability over time, is not to be considered lightly. If a construct is to be predictive of, or predicted by, some other construct, then one must be reasonably sure that one does not change more than the other, proportionately, at least over the time interval between the measurement between the two constructs. This illustrates issues of import to the idea of nomological or *predictive validity* as well.

Predictive validity is the degree to which predictions made by a test are confirmed some time later by what is called a *criterion measure* (nomological validity refers to the degree to which predictions from a formal theoretical network containing the concept are confirmed (Campbell, 1960; Cronbach & Meehl, 1955). This measure may take the form of observer ratings of behavior, paper-and-pencil tests, etc. The important thing to remember is to match the measures to the content, as discussed above. This is essentially a correlation between the content to be predicted in the future, and a measure which utilizes this content as its basis. For example, an algebra aptitude test may be administered to eighth-grade students to predict success in a ninth-grade algebra course. The criterion measures of this aptitude test may be either ninth-grade algebra class scores or some sort of algebra achievement test. Associated with the above discussion pertaining to the applied orientation to construct validity, the criterion may be highly specified, due to its application possibilities (practical application), and extreme care must be taken to make the test "fit" the measure. Correlations, regression analyses, and causal modeling may be used for this purpose (Venkatraman & Grant, 1986, p. 79). Of more practical concern is the utility of such efforts. This involves the determination of *base rate*, which is the proportion of persons who meet the criterion out of the total number of persons in the population. This number should not represent either an extremely high or low percentage of persons in the population. For example, if only 5 persons out of a sample of 100 exhibit an incidence of some factor, say neuroticism, then a test to predict neuroticism would have to be extremely efficient at identifying those individuals so affected, because one could just predict that no one would be neurotic, and

be correct, 95 percent of the time. However, if the issue is important enough, utilizing some or all of the above mentioned techniques may enable a researcher to develop a suitable prediction equation. This may be worthwhile, if this equation is *cross-validated* by administering the same tests to a new sample drawn from the same population (Borg & Gall, 1983, p. 279).

Convergent Validity

Convergent validity refers to the extent to which responses from alternative measurements of the same construct share variance (Schwab, 1980, p. 17). In other terms, it is the degree to which different measurement methods of a concept are in agreement (Morrow, Eastman, & McElroy, 1991). The criteria for assessing convergent validity calls for the use of multiple methods to measure the same construct. Methods which might be employed are interviews, questionnaires, archival data, participant observation, published secondary data, expert opinion, and the use of different types of scales (Venkatraman & Grant, 1986, p.82). Campbell & Fiske's (1959) multitrait-multimethod methodology is commonly referred to this purpose. For convergence to represent construct validity one must assume that the methods are uncorrelated. In other words, measurement methods can be viewed as one source of variance and their impact on the universe score can be estimated. It should be noted, that in applied orientation situations, the construct may be so rigidly defined that it is procedure specific. Although the multitrait-multimethod methodology is popular, Schwab argued that its implications for construct validity has been much over-emphasized. Results from the method vary with sample size. Also, one must *assume* that the methods are uncorrelated.

Cronbach (1950), Jackson & Messick (1958), Smith (1975, p. 136-140), and Webb, Campbell, Schwartz & Sechrest (1966, p. 19-21) discussed why alternative methods can yield correlated results when responses are obtained from individuals. Schwab cited a factor analytic technique by Jackson (1969), or path analytic technique (Althauser & Heberlein, 1970; Alwin, 1974) as better examples of how method variance may be decomposed from construct variance.

The difficulty in assessing convergent validity is further exacerbated by the issue of shared variance that *is not* due to the methods used. A high correlation between measures may be due to contamination, via inadequately defined construct(s) and hence, its measure(s). A low correlation may also be misleading, because it may still be too high to accurately convey the degree of variance inherent in the “true” construct.

Nonetheless, convergence is an issue worth examining, in that it is useful to know the extent to which alternative procedures, whatever their common method variance, yield similar results. Schwab (1980) astutely delineates the utility of estimating convergent validity:

If two or more measures do not converge and if it is assumed that method variance, if any, adds rather than detracts from the resulting correlation coefficient, it can be concluded that at least one of the procedures is not providing construct valid results. Thus, convergence can still be viewed as necessary to construct validity (p.19).

Schwab also cautiously noted that convergence can be of some value in estimating the likelihood that substantive results are measure specific. Although alternative measures

seldomly yield high correlation coefficients, evidence of construct validity may exist when employing nonconvergent measures to investigate relationships (Schwab, 1980, p. 35, see note 13).

Factor Analysis

Factor analysis can be useful to construct validation in many ways. The fact that it is a purely mathematical technique warrants some caveats regarding its use. A common use is its application towards identifying tentative dimensions that are represented by an instrument. It should be apparent that it only identifies dimensions within the items included in the analysis. Secondly, it is commonly known that the results of a factor analysis are likely to be sample specific. This potential problem may be somewhat ameliorated by having a large sample relative to the number of items factored. A minimum ratio of 10:1 is recommended (Schwab, 1980, p. 19). A third problem related to the use of factor analysis involves sample heterogeneity. A factor analysis can only be generalized to another population with similar sample characteristics, such as age, gender, and/or level of category. Thus, samples utilized for the development of an instrument must be representative of the type of populations for which substantive research investigations may be undertaken.

Another appropriate use for a factor analysis is associated with the internal consistency notion of *unidimensionality*. Unidimensionality refers to the extent to which items reflect an underlying concept. Its assessment is usually substantiated by factor analysis (Morrow, Eastman, McElroy, 1991). Factor analysis is useful for determining the unidimensionality of subscales of multidimensional construct measures as well.

Factor analysis is useful, not only as a means to develop items and determine dimensions, but also as a method to test hypotheses about an already developed scale. Content and factorial analyses of scales purported to measure the same construct should provide pause for the researcher intent on developing a new measure.

An especially useful research methodology for ascertaining similarities and differences among concepts is facet analysis (Guttman, 1954; Shapira & Zevulun, 1979). This method, and a literature review of other correlational studies, may enable the investigator to specify the number of dimensions to be expected, a priori. If a factor analysis of the measure under scrutiny matches in dimensions, then an "eyeball" comparison with a similar measure may reveal whether test items load on the appropriate factors (Dunham, Aldag, & Brief, 1977; Herman & Hulin, 1973).

Discriminant Validity

Discriminant validity refers to the idea of differentiation among constructs. Therefore, its utility lies within the purview of the scientific orientation to construct validity, as compared to normative or applied orientations. The statements made regarding convergent validity apply here as well, especially those involving the interpretation of relationships found (i.e. correlations between construct measures). The role of the construct definition is to be noticed here. Alternative constructs, although specified differently, often correlate high enough to provide evidence of convergence. It is recognized that measures of constructs that are believed to be multidimensional often do not covary to a high degree (Schwab, 1980, p. 23). The issue of concept redundancy appears to a serious problem, based on the number of recent articles on the subject

(Morrow, Eastman, & McElroy, 1991; Osigweh, 1989; Morrow & McElroy, 1986; Schwab, 1980). A multi trait-multimethod analysis may be the best method for investigating issues related to convergence/divergence. In fact, even if two measures can be shown to relate differentially to other constructs, it would be inappropriate to assume that they in fact are representative of disparate (dissimilar) constructs. This is true unless it can be additionally assumed that the two measures are equally reliable and that they assess unidimensional constructs (Tesser & Krauss, 1976).

In summary, it would seem apparent that the fundamental issues regarding construct validity are founded in the degree of effort made to embed a construct within a well-articulated nomological net (Schwab, 1980, p. 23; Venkatraman & Grant, 1986). As an illustration, consider the possible causes for an experiment or investigation in which little correlation was found to exist. Possible reasons would include a failure of, (a) the ID hypothesis, (b) the I' measure, (c) the D' measure, (d) some combination of the three or (e) a sampling artifact (lack of statistical power). An illustrative situation in which positive results are acquired (for instance, a correlation is obtained) provides only a small degree of comfort, because numerous conditions must be held constant before validity may be implied. Schwab (1980), remarking on this situation in organizational behavior research, stated it quite well, "In terms of enhancing our knowledge it would be desirable if some of the entrepreneurial spirit that characterizes much of the research in the field would be subordinated to the mundane task of more, nearly literal, replications" (p. 23).

The Protestant Work Ethic

The "protestant work ethic" is a term used to describe a belief structure which

basically holds that work is morally good and needful if a person is to be labeled righteous. Max Weber, in his seminal work *The Protestant Work Ethic and the Spirit of Capitalism* (1904,1905), hypothesized that individuals holding this belief accounted for the rise of what is called today modern capitalism; i.e. the economic system in which it is acceptable, indeed desirable *for individuals* to work towards the obtaining of goods and wealth for *private use and profit* (P. 10).

The "protestant" view towards work has been attributed to the teachings of predominantly two clergymen - Martin Luther and John Calvin (Hill, 1993). As an Augustinian friar in the Catholic church, Luther became disgruntled with the lack of care that his fellow monks showed towards the peasants and lay people in their parishes. The medieval concept of work held that some forms of work were more desirable or honorable than others; the work and workers of the Church were to be esteemed more highly than the labor and produce of the peasant; the product of the craftsman as well as the worldly gain of the merchant were somewhere in between. Luther contended that a person's vocation was his "calling" from God, and as such mortal man had no right to judge the value of one form of work above another (Tilgher, 1930, p. 47). He did not approve of commerce as occupation, however, because it did not involve any real work. (Lipset, 1990, p.62).

Later, John Calvin, a French theologian, combined some of Luther's ideas with his own to develop another important doctrine - that of the Elect (Weber, 1904, 1905). The predominant concept comprising this doctrine was that of predestination, that is, those persons who were to inherit eternal life were already chosen by God; all others were

damned, and nothing could change this, since God is immutable. Tilger (1930. p. 53-61) stated that one of the primary evidences for possible inclusion in the Elect was a person's success in worldly endeavors. Lazy people were most certainly among the damned, but those who worked hard *and* gave generously to the church and the poor gave good evidence to himself and to others that he was one of God's chosen ones. Most certainly, two commonly quoted Bible verses would be 2 Timothy 2:15 - "Do your best to present yourself to God as one approved, a workman who does not need to be ashamed and who correctly handles the work of truth", and 2 Timothy 2:19 - "Nevertheless, God's solid foundation stands firm, sealed with this inscription: The Lord knows those who are his, and, Everyone who confesses the name of the Lord must turn away from wickedness" (NIV;1973, p.218).

There is a very important distinction to be made regarding Luther's views related to his concept of one's "calling" and those of Calvin's. To Luther, the job, occupation, or other status of life was set by God; therefore one should not seek to change his lot in life; rather he should dignify his status by being a trustworthy and faithful servant. Calvin, on the other hand, held that success (predominantly monetary) was paramount; that maximization of earnings indicated one's inclusion into the Elect. If more wealth could be created via a different occupation than that of the family, then the change was not only allowed, but it was considered a religious duty.

The two teachers held similar beliefs as well. Two of the more important ones would be the views that work was to be considered good, acceptable and indeed necessary to be pleasing to The Lord; and earnings were not to be spent on oneself, but

were to be used for God's glory.

Departing from the above theological perspective (as delineated by Weber) for the origin of the protestant ethic, Hill (1993) cited the writings of Anthony (1977) and Bernstein (1988), who offered what he called the materialistic or Marxist viewpoint. In essence, the materialist viewpoint stated that the causal factors for the development of the Protestant ethic came from economic changes that were occurring in Europe at the time. Three trends given by Bernstein (1988, p.8) were: (a) a rapid population increase in Germany and Western Europe, (b) inflation, and (c) a high unemployment rate. The resulting effect was a dramatic increase in unemployment and poverty. Proponents of the Marxist or materialistic view assert that religious teachers developed doctrines that would encourage the unemployed to take on menial, demeaning work, rather than accept the typecast of being called lazy, since work was a necessary penance for original sin. Regardless of perspective, the development of the Protestant Work Ethic is generally accepted as being the causal factor for the advancement of capitalism in Western society (Mirels & Garrett, 1971; Furnham, 1990a).

The Work Ethic in Historical America

Cherrington (1980) provided a very good overview of the work ethic in America, and the challenges and changes to its definition and vitality that were to come during the country's colonial, industrial, and postindustrial periods. Changes in the nature of work, in conjunction with transformations of all kinds in society in general have seriously challenged the relevance of the traditional work ethic.

Benjamin Franklin's *Poor Richard's Almanac* has been given credit for a

modification of ideological base of the American work ethic from a ecclesiastical form to a more secular one (Cherrington, 1980; Maccoby & Terzi, 1981). For early Americans, work was a necessary and important part of life. Almost all jobs were imbued with dignity and value. The skilled trades were at their peak and long apprenticeships were common. Craftsmanship was applauded and expected. Poor quality work was called slothfulness and condemned as loudly as idleness (Cherrington, 1980). Because these, and similar work values, were not exclusively held by protestants, other writers have chosen to use other terms to label these positive attitudes towards work. Puritan ethic is one term; another the "character ethic" (Cherrington, 1980). The work ethic was an important part of religious teaching as well as a common subject in schools and the popular press.

Universally, writers have attributed the first signs of erosion of the work ethic to the coming of the Industrial Revolution. The factory wage system posed an especially serious challenge to the moral importance of work. There was a sense of autonomy and freedom in craftsmen's shops under the cottage system. Many compared the factory system to slavery; a worker who was chained to a factory job was no more free than a slave chained to his master. In essence, workers in the shops were paid for what they produced, and in the factories, they were paid for their time. (Rodgers, 1978).

Zuboff (1983), Rodgers (1978), and others highlighted the development of scientific management and its subsequent utilization of productivity specialists as a critical factor in the decline of work ethic values. Jobs were dissected into even smaller, more specific tasks, which did not allow the worker to observe his contribution to making a

quality product. This effect has been used successfully by labor (unions) in the past to bargain for higher wages. More recently, the effect has been used by labor authorities to argue for changes in management practices which help diminish this effect, and supposedly to increase quality as well as productivity (Byrne, 1990).

The loss of worker autonomy inherent in the factory system is a rather salient component of the overall "problem" of work ethic decline. A second challenge to the work ethic resulted from the efficiency of the factory system and the materialism it produced (Cherrington, 1980). Between 1860 and 1920, the population of the United States tripled, while the volume of manufactured goods multiplied by a factor of twelve to fourteen. During this period, the economy changed from one of excess demand to one of excess supply in several major industries. Competition forced many manufacturers to lower prices for their goods. More people could afford items once considered extravagant. According to Rorabaugh (1986), economic prosperity was no longer assured by diligent work. The worker was viewed less as a craftsman and more like a laborer. With more leisure time, affordable goods, and available services, the importance of working hard diminished and the importance of enjoying one's labor increased.

But even during this early period, attempts were undertaken to bolster worker morale through the use of workers' cooperatives, profit sharing, stock purchase plans, industrial democracy, and piece-rate incentive plans. While none of these schemes restored the conditions of freedom and autonomy that had existed earlier, they did provide for an additional sense of *compensation*. In fact, piece rates were established on specialized jobs that placed increasingly tight restrictions on the movements of workers.

Zuboff (1983) remarked that the number of unions to win formal rights to collective bargaining expanded during this time. He stated that Bill Haywood's motto for the working class was "the less work the better," and that it was this sentiment that dominated the labor movement from the 1860s well into the 20th century.

The "traditional" model of management was utilized by many American industrial organizations in the period from the early 1900s to the 1950s. This model was characterized as being very authoritarian. It held that "the average worker was basically lazy and was motivated almost entirely by money" (Daft and Steers, 1986, p.93). But by the end of World War II, scientific management was considered inadequate and outdated to deal with the needs of industry (Jaggi, 1988, p. 446). Zuboff (1983, p. 163) stated that American employers' began to notice (through experiences with collective bargaining) a dysfunction inherent in trading satisfaction in work with extrinsic rewards alone.

Reinhard Bendix (1974, pp. 309-19) credited Elton Mayo with providing the synthesis needed by the managerial community to confront this apparent contradiction. Stoner and Wankel (1986) also credited Mayo and other behaviorists for establishing theories which hold that workers' social needs and motivations should be taken into account as well as their economic needs. Zuboff (1983, p.166) used the term "psychologized work ethic" to describe this approach to assessing the work values of postwar - World War II workers. He credited a study by Zalesnik, Christensen, and Roethlisberger with Homans (1958) as the consolidation of a new and modern work ethic. These authors argued that work rationalizations had created an abundance in output brought on by increased efficiencies. Thus, the basic needs of the workers had been satisfied. They now required motivational

tools which could help them meet higher order needs.

Frederick Herzberg (Herzberg, Mauser, & Snyderman, 1959) conducted one of the first major studies to determine job motivation utilizing a psychological approach. The outcome was his theory of *motivation versus hygiene*. In response to the question, "What do people want from their jobs?" (p. 113), Herzberg found that respondents' negative feelings towards their jobs were generally not associated with the job itself, but rather with the conditions that surround the job. Conversely, when respondents reported feeling happy about their jobs, they most frequently described, (a) factors related to their tasks, (b) events that indicated to them that they were successful in the performance of their work, and (c) the possibility of professional growth. Thus, hygiene factors are related to the work environment. Examples include supervision, interpersonal relations, physical working conditions, salary, company policies, administrative practices, benefits, and job security. "...Hygiene operates to remove health hazards from the environment of man. It is not a curative; rather it is a preventive" (Herzberg, Mauser, & Snyderman, 1959 p.113).

Factors related to the *context* of the job are important because improvement of these factors will serve to remove *impediments* to positive job attitudes. If some of these factors deteriorate to a level below that which the employee considers acceptable, then job dissatisfaction ensues. But the reverse does not hold true. An optimal job context (environment) will not cause dissatisfaction, or provide for job satisfaction. In other words, job satisfaction requires appropriate and sufficient *motivating* factors, which are needed in addition to appropriate and sufficient environmental (hygiene) factors (Herzberg, Mauser, & Snyderman, 1959, p. 114).

Herzberg referred to personality theorists such as Jung, Adler, Sullivan, Rogers, and Goldstein for the concept of "self-actualization" (Herzberg, Mauser, & Snyderman, 1959, p. 114). He stated that "... the supreme goal of man is to fulfill himself as a creative, unique individual according to his own innate potentialities and within the limits of reality" (p. 114). "Man tends to actualize himself in every area of his life, and his job is one of the most important areas" (p. 114). Self-actualization and other higher-order needs cannot be met through the optimization of satisfiers or hygiene factors. "The conditions that surround the doing of the job cannot give him this basic satisfaction; they do not have this potentiality. It is only through the performance of a task that the individual can get the rewards that will reinforce his aspirations" (p. 114). Herzberg found that achievement and recognition were the two most frequently reported motivators for individuals, followed by *work itself*, responsibility, and advancement. Salary, or other monies earned as a direct reward for outstanding individual performance can be considered a reinforcement of the motivators of recognition and achievement as well. Herzberg summarized his discussion of the two factor types with the statement, "The motivators fit the need for creativity, the hygiene factors satisfy the need for fair treatment, and it is thus that the appropriate incentive must be present to achieve the desired job attitude and job performance" (Herzberg, Mauser, & Snyderman, 1959, p. 116). Herzberg, et. al. (1959) provided some recommendations for employers, whether public or private, in order to put this study into perspective. First, good hygiene practices will prevent many of the negative results of low morale. But an overemphasis on hygiene carries within itself the seeds of trouble. Secondly, instead of laying down rigid rules and

demanding that these rules be followed, a supervisor should trust their ability to discriminate good end results from poor end results. These suggestions were given in response to the trend towards greater automation and higher levels of bureaucracy of that time.

Herzberg's views on worker motivation acts as a seque or bridge to the following section on work values in the contemporary world. As he saw it, the problem of declining (work) ethics was fundamentally due to a loss of strength in the bonds holding individuals together. This, according to Herzberg, was due primarily to three things. First, is a condition of "anomie" (a lack of norms or guideposts), brought about when an individual who has high ideals and a lively sense of ethics is forced to compromise these ethics and ideals in everyday life. Second, the sheer size and complexity of our urban civilization may itself contribute to this sense of distance among people. And third, a change in the way in which social activity is coordinated and directed; namely, the replacement of face-to-face relationships and authority figures (such as master workmen under the guild system, and those of royal lineage) with bureaucratic laws and predetermined rules, which have no face (Herzberg, Mauser, & Snyderman, 1959, p. 114-15). Years later, Herzberg's theory of motivation is still used as the basis for many management practices. His opinions related to work ethic decline and improvement are as contemporary as ever. As an example, Kate Ludeman, (1989) in her book The Worth Ethic: How to Profit from the Changing Values of the New Work Force:

There is no leader without followers. We succeed together or not at all. This is the essential "W.E." of the Worth Ethic, the belief in your indelible self-worth and

the fundamental and potential worth of others. The conviction that you are personally capable and have significant contributions to make to the world fosters a belief that others, too, are worthy (p. 4).

The Work Ethic in Contemporary Society: Practice and Research

Attitudes towards work seem to have come almost full circle during the period of the 1960s to the 1990s. For instance, Spence (1985) asserted that *many* of the young people of the 1960s and 1970s rejected the work ethic of their parents (which was based on materialism and getting ahead), and replaced it with one of their own, which valued self-actualization and idealistic careers. Hollingsworth (1995) described the "Me Generation" of the 1980s as being more egocentric; self-gratification, profits without conscience, and hedonistic life styles were considered acceptable. But as the American worker experienced the tremendous cultural and social shifts of the new information age, attitudes towards the value and meaning of work was transformed once again into positive ones (Yankelovich and Harmon, 1988, p. 238-239).

Zuboff (1983) provided a concise, yet cogent, summary of how shifts in the American culture and economy allowed for a reinterpretation of the work ethic into values which "...emphasized the sacredness of the self and taught that individual moral calculations provided sufficient criteria upon which to embrace or oppose discrete aspects of organized social life" (p.153). Public and private employers developed new principles of work organization in order to counter failing morale and falling productivity. Examples include, (a) physical design of facilities that are congruent with social objectives, (b) job designs that give emphasis to self-managing work teams,

(c) compensation systems that reward skill development, (d) organization structures that minimize hierarchy, supervision, and functional specialization, (e) a heavy emphasis on training, personal growth, and career development, and (f) a management style that allows decision-making to be pushed to the lowest levels of the organization (Lawler, 1978).

Miller (1986, p. 63) related how both white collar, as well as blue collar jobs were transformed into high-discretion ones with the arrival of the information age. Maccoby (1988) states that information age employees were motivated (to work) by giving them authority to make decisions which would meet the needs of customers as well as support the goals of their own companies. And according to Yankelovich and Harmon (1988), autonomy is an especially important factor in satisfaction with their jobs as well. In short, workers sought out opportunities for more personal growth, self-knowledge, and meaning. Information age jobs helped meet these needs.

Hill (1993) provided a good overview of other issues related to changes in the contemporary work ethic as well. Among them are the increasing number of women workers who bring unique needs and expectations to the work environment such as the need to help others, to be creative and original, and to work with people rather than things. Due to the fact that older workers are retiring at an earlier age, there is also a trend toward the use of younger aggregate workers. This is important for two reasons, (a) the concept of work as a privilege is not held as strongly (Cherrington, 1980), and (b) although there appears to be little evidence for a decline in commitment to the work ethic (Yankelovich, 1981), younger workers do expect the application of a positive work ethic to result in rewards more quickly than older workers, relatively speaking (Sheehy, 1990).

Finally, Cherrington (1980), Hill (1993), and others discuss influences related to a decline in values training, in both structured and non-structured settings. For instance, Cherrington stated that since 1950, the work ethic has not been related to or taught as aggressively in the popular literature. He also noted the increased viability of leisure as an alternative to work. The promulgation of the "leisure ethic" is especially important, as more individuals seek to analyze their "life space", and to balance work and non-work activities (Parker, 1983). Hill discussed the indoctrination of work ethic values via the socialization processes, both in the home, and the workplace. He referred to Braude (1975, p.134-136), who stated that values are formed primarily during childhood and adolescence. But Braude also recognizes that when a person enters the workforce, the perceptions and reactions of others tend to confirm or contradict the work attitudes shaped in childhood.

Hill (1993) expressed the opinion that one of the primary functions of schools is to foster student understanding of cultural norms, and in some cases to recognize the merits of accepting them. In specific, he provided vocational education as an example of how these values may be taught, and cited Gregson (1990, p.151) who said that one of vocational education's stated goals is to promote the work ethic. Hill also stated that schools are not a substitute for the inculcation of work ethic values in the home. He indicated that secondary education should enlighten students about what the work ethic is, and why it is important to success in the contemporary workplace.

Research on work and work values, and how these and other related terms are defined, has been accelerating during the last three decades. These studies may be

roughly categorized into two functional groupings. One group seeks to describe the work ethic of specific demographic groups. Another group has focused on defining, developing, and comparing/critiquing work ethic instruments in an attempt to better delineate this dynamic label.

Group Studies

Various research studies have sought to assess, shape, or otherwise discover the significance of work values for special populations. One popular variable of these studies has been that of gender. Cherrington (1980) reported that there are two important differences between the work attitudes of males and females. Males believe more strongly that work should be one of the most important parts of life. But Cherrington states that this is understandable, since women generally play a larger role in rearing children and running a home. What is seemingly more profound is Cherrington's finding that women exceed men in almost all questions regarding pride in craftsmanship and helping others. In a study of gender and attitudes towards work using equal ratios of women-to-men Polish and German students, Maurer, Oszustowicz, & Stocki (1994) found that women are less competitive and view the status of economic gain as a status symbol less so than men. These findings seem to harmonize with those of Watts (1992), whose study of 165 university female support staff revealed that, (a) none desired hierarchical advancement, (b) most placed family above work, (c) they liked challenging, varied work, (d) felt that job social contacts were motivating and (e) highly desired flex-time work arrangements. But not all researchers believe that there are gender differences in work values. Using General Social Survey data of 7,436 full-time workers from 1973-

1990, Rowe & Snizek (1995) reported that no support was found for differences in work values. Rather, they found preferences depended more on age, education, and occupational prestige. Three studies using Petty's (1990) Occupational Work Ethic Inventory (OWEI) were found that demonstrated evidence of differences related to gender. All three studies found significant differences for gender for all four subscales of the OWEI, i.e. *dependable, ambitious, considerate, and cooperative* (Hill, 1993; Allender, (1993); Petty & Hill, 1994).

Contrary opinions and diametrically opposing conclusions have been the result of many studies of work attitude differences associated with age. Cherrington (1980), in his well-known study of 3,053 workers in 53 companies throughout the United States, concluded that age was significantly related to work values even when other variables - income, seniority, sex, education, and occupational status - were controlled.

Lankard (1995) citing the work of others, states that Generation X, the population cohort following the Baby Boomers, do not have a poor work ethic - they just view the concept of career differently. A Swedish study on the work attitudes of young people supported this finding. Young people possess internal or postmaterialistic values in addition to more traditional values associated with work. Girls ranked higher on intrinsic work goals than economic ones (Hagstrom & Gamberale, 1995). Many studies on work attitudes or values of young people cite degrees of dissatisfaction with their "work attitude" (Capelli & Iannozzi, 1995). The perception that there is a problem with the work ethic of younger workers, and that more effort should be made to teach work values was found to be held by employers (Florida State Department of Education, 1991;

Donsky, A., & Others (1994); Ford & Herren, 1993; Cappelli & Iannozzi, 1995), teachers (Gregson & Bettis, 1991), parents and principals (National PTA, 1992), and government (Nierdergang, 1992; National Council on Vocational Education, 1991). A review of the literature revealed the greatest effort being made to teach work values is being undertaken by vocational education.

The National Council on Vocational Education (NCVE)(1991) and a Presidential Advisory Council, in a series of meetings with representatives from business, industry, and education came to the conclusion that the most desirable and successful employees were those having a positive attitude towards work. McCracken and Falcon-Emmanuelli (1994) stated that if vocational education is to have an impact in preparing students for the workplace of the future, the curriculum must include provisions for values training. This sentiment is held by Bjorkquist (1991) as well, who adds that vocational students need preparation for the conditions and context of work - and this prep should include work ethic training. Other writers contend that work ethics training should even be included in the elementary school curriculum (Hearing, 1993; Andrews & Martin, 1995).

Regarding the teaching of work ethic values, Ford & Herren (1995) in a survey of 160 work program coordinators in Georgia, found that coordinators felt that the teaching of work ethics in their classrooms was largely informal or unintentional. Cherrington (1980), in discussing the teaching of work ethics values, stated that indoctrinational strategies are commonly used. However, Gregson & Bettis (1991) through a series of interviews with trade and industrial instructors across Virginia, did not find evidence to support the contention that vocational instructors use primarily indoctrinational strategies

to teach work values and attitudes. Although reward structure and role modeling were used extensively, more democratic strategies, such as group discussion, on-on-one counseling, and role playing were also frequently used.

Examples of several methods and techniques utilized to teach and/or bolster work ethic values/attitudes were found in the literature. Miller & Brown (1990) developed a supplementary instructional packet to be used in conjunction with the Illinois teacher's manual, entitled Vocational Ethics: Toward the Developing of an Enabling Work Ethic. The manual stresses the use of ethical dilemmas, how to identify stakeholders, and how to develop assertiveness, listening, risk-taking, and negotiation skills. Examples of individualized and group instruction programs were found. The individualized program was based on individualized cooperative education (Oklahoma, 1992), and the group-based program, as described by Nelson (1992) was based on the use of "The Work Ethic Game," which focuses on integrity in the workplace. It is divided into three categories: legal, judgment, and policy issues.

Other writers describe additional ways to develop work values as well. Gregson (1994), drawing from Dewey and critical theory, narrated on the use of problem posing in an employability skills curriculum to promote reflection and involvement. Anderson School District Five, SC (1994) reported on their use of "job shadowing", as a one-on-one participatory activity that allows an interested student to spend several hours or a day with a host employer or business in order to gain career goals and see the relevance of their curriculum in the "real world."

Other cohort investigations regarding an adherence to, or nature of, work ethic

values have been undertaken as well. One exploratory study examined the thesis that the work ethic values of the self-employed are what Max Weber identified as the Protestant Work Ethic (Jaeger, 1995). Thirty-three full-time self-employed persons were randomly selected and given a semi-structured interview and questionnaire about their work. The results suggested that the self-employed expressed characteristics that social scientists have identified as the values of the Protestant Work Ethic. These workers utilized descriptors that could be interpreted as representing Weber's ideal archetypes, including an appreciation and commitment to hard work, frugality, perseverance, autonomy, a need to achieve and a need for meaningful work.

A study by Zippay (1995) examined behavioral changes in 102 able-bodied blue-collar workers who experienced job loss in the 1980s. The study focused on a subgroup of 11 who became "discouraged" and withdrew from the labor force. The author was unable to ascertain the effect of job loss on work ethic; neither structural or individual theories appeared to completely or adequately explain their situation and affect. However, she suggested that a complex intertwining of various theories which include the components of reactance, learned helplessness and social learning could possibly provide some illumination.

Two studies were found which investigated differences of culture among countries regarding work ethic values. Another study sought commonalities. One study examined country group differences in economic beliefs and attitudes (Furnham, Kirkcaldy, and Lynn, 1994). Nearly 12,000 students from 41 countries completed questionnaires measuring 7 traits: work ethic, achievement motivation, mastery,

competitiveness, achievement through conformity, money beliefs, and attitudes to saving. The authors found that countries from North and South America scored highest on work ethic and mastery while young people in Far and Middle Eastern countries reported the highest competitiveness and acquisitiveness for money. Another study specifically measured and compared Protestant Work Ethic score in 13 countries, utilizing 7 work ethic scales with varying reliabilities and validities (Furnham, Bond, Heaven, and Hilton, 1993). There was a highly significant difference between the scale scores of the subjects from the different countries, and the differences tended to be consistent for the disparate measures. Subjects from richer, First World countries tended to have lower scores than those from Third World countries. Also, the authors discovered a significant correlation between the most well known work ethic scale score and G. Hofstede's power-distance score, indicating that work ethic belief is associated with the amount of weight that is placed on prestige, power, and wealth in a society. Giorgi and Marsh (1990) reanalyzed data from a 1981 European values survey to (a) determine the existence of a consensual work ethic among modern industrial societies and, (b) examine the link between work ethic and religion. France, Italy, West Germany, the United Kingdom, Holland, Belgium, Denmark, and Spain comprised the country groups. These Western European cultures appeared to embrace similar values associated with work. Specifically, the authors discovered what they called a "vocational work ethic", which stresses the rewards of self-fulfillment and social obligation. This ethic, in turn, was linked with religious denomination and degree of religious fervor. Also, people who had more education had higher work ethic values.

Other Work Ethic Studies

In addition to studies of groups, many studies have investigated beliefs or concepts which may influence work ethic values as well. Heaven (1990), for instance, investigated the extent to which Protestant work ethic (PWE) and economic locus of control (ELOC) beliefs were related to suggestions for reducing unemployment among 285 adults. The following PWE and ELOC elements were found to be significantly correlated: Individuals with high PWE and internal ELOC scores supported tough-minded options, such as the reduction of entitlement programs, while those who felt that their own economic well-being was due to chance factors or powerful others (i.e. low-ELOC individuals) supported tender-minded (e.g. increased government spending) options.

Two related studies investigated attitudes toward money as related to work ethic. Kirkcaldy and Furnham (1993) utilizing path analysis, found that the variables of work ethic, conformity, and mastery operated indirectly through the mediating effect on achievement motivation, competitiveness, and beliefs about money. Factors such as work ethic, mastery, and achievement appeared to have a direct causal effect on competitiveness. Tang and Gilbert (1995), utilizing a population of 155 mental health workers, investigated attitudes towards money as related to intrinsic and extrinsic job satisfaction, stress, and work-related attitudes. Intrinsic job satisfaction was positively related with the concept that money represents freedom and power, while money itself was not found to be motivator. Subjects who endorsed the Protestant Work Ethic rated money positively, and correlated it positively with achievement.

Two studies were found in the review of the literature which explored the relationship between Type A personality behavior and Protestant Work Ethic. Both studies found weak evidence of correlation, and these effects appear to be related to the concept of need for achievement (Furnham, 1990b; Mudrack, 1993).

Guastello, Rieke, Guastello, and Billings (1992) examined the interrelationships among cynicism, depersonalization, estrangement, work values, and basic personality traits. Among the findings from data collected on 106 college students, they found that cynicism was positively correlated with having a Protestant work ethic.

Babu and Reddy (1989) compared job involvement, Protestant work ethic, and job involvement scores of workers in secular and religious institutions. The religiosity of subjects working for the religious institution was higher than that of subjects working for the secular institution (state government). Protestant work ethic attitude and job involvement was similar for the two subject groups.

The effects of work ethic and task labels on task preference was investigated by Tang (1989). After determining each subjects' work ethic (high or low), the amount of time spent on an experimental task (labeled easy or difficult) was measured. For high work ethic subjects, task preference was not affected by the labels. Low work ethic individuals had a higher task preference for the difficult condition; however, they exerted more effort during the "free choice" period when they were challenged.

Feather (1992) explored the relationship between values and actions from the point of view of expectancy-valence theory. Results of a study of job-seeking behavior among the unemployed indicated that values linked to the work ethic were positively

associated with job valence.

Investigating the concept of academic involvement, by surveying 213 adult part-time students, utilizing two measures, Farrell and Mudrack (1992) concluded that this is a viable concept. Women tended to have higher scores on these measures, indicating that they have an internal locus of control, a need for achievement, and a strong Protestant work ethic.

Illegal or unethical behavior of an employee may not be due to a weak work ethic or character flaw in an individual, but rather a reaction to inequities or ineffective justice systems within an organization, according to Szwajkowski (1989). The author suggested that a mechanism of self-help (rather than the use of the normal channels of grievance redress, such as authorities or established systems) is utilized by the employee to remedy or rectify equity issues. The author suggested that managers would do well to analyze organizations' s systems of distributive and procedural justice in addition to diagnosing security loopholes or employee traits.

Many books, articles, and research papers have recently been published on the subject of leisure wellness or the leisure ethic. These concepts came into being in response to the need to balance work and leisure activities. Although a discussion of the concept of leisure ethic is inappropriate here, two articles were found which discussed the connection between work ethic or attitude and nonwork domains. Cohen (1995) examined the relationship between various forms of work commitment (i.e., organizational commitment, job involvement, Protestant work ethic) and nonwork domains. The results suggested that nonwork domains affect all work commitment

forms, with organizational commitment being especially amenable to change through organization support strategies. An earlier work by Berniker (1993) suggested that a new American work ethic might be created through the organizational change strategy of "gain-sharing", wherein the wealth created by increased productivity is invested in creating open-ended, mutual obligations within organizations. Another author suggested that architectural design can play an important role as well, by focusing more on social and cultural implications as well as on the instrumental aspects of the workplace (Spreckelmeyer, 1995)

Kirkcaldy and Cooper (1992) inquired into the differences between the sexes for work attitudes and leisure preferences. They used two questionnaires, the first of which encompassed seven dimensions of attitudes toward work. The results indicated that women who expressed a preference for the traditionally male sex-type styles of leisure preferences (e.g. basketball) yielded substantially higher scores on work-oriented competitiveness. Women who preferred to avoid competitive off-work activities had lower scores on competitiveness at work, work ethic, achievement motivation, and achievement/motivation dimensions. This work attitude-leisure preference relationship was observed for men as well, but it was not nearly as strong.

Instruments, Scales, & Construct Comparison Studies

As stated in the Introduction, over 25 work commitment measures have been developed (See Table 2). Most of the concepts/measures are over 25 years old. This discussion will focus on the more frequently used instruments, as well as recent articles related to work ethic instruments, scales, and construct comparison studies. Extra

Table 2. Forms of Work Commitment*

Value	Focus	Reference(s)
Protestant work ethic endorsement		Blood, 1969
Protestant work ethic endorsement		Mirels & Garrett, 1971
Conventional ethic (pride in work) subscale of survey of work values		Wollack, Goodale, Witjing, & Smith, 1971
Work ethic		Buchholz, 1978
#Occupational work ethic		Petty, 1990
<i>Career</i>		
Career commitment		Quadagno, 1978
Career salience		Greenhaus, 1971
Career salience (for women)		Almquist & Angrist, 1971
Commitment to a profession		Sheldon, 1971
<i>Job</i>		
Job involvement (personal identification with work dimension)		four items from Lodahl & Kejner, 1965; popularized by Lawler & Hall, 1970
Job orientation		Fiden & Jacobson, 1976
Job attachment		Koch & Steers, 1978

Table 2. Forms of Work Commitment (cont.)

Focus	Reference(s)
<i>Job (cont.)</i>	
Job involvement	Patchen, 1970
Ego-involvement	Slater, 1959; Vroom, 1962
Work as a central life interest	Dubin, 1956
<i>Organization</i>	
Organizational commitment (calculative, moral dimensions)	Mowday, Porter, & Steers, 1979
Organizational commitment (calculative dimension)	Hrebiniak & Alutto, 1972; Stevens, Beyer, & Trice, 1978
Organizational identification (moral dimension)	Hall, Synder, & Nyglren, 1970
Organizational commitment (moral dimension)	Buchanan, 1974
<i>Union</i>	
Union commitment (Various attitudes toward union scales could be construed as commitment measures)	Gordon, Philpot, Burt, Thompson, & Spiller, 1980
<i>Combined Dimensions of Commitment</i>	
Job involvement (6 and 20 item versions)	Lodahl & Kejner, 1965
Work values	Cherrington, Condie, & England, 1979

Table 2. Forms of Work Commitment (cont.)

<i>Combined Dimensions of Commitment (cont.)</i>	
Occupational involvement	Faunce, 1959
Willingness to accept an annuity	Kaplan & Tausky, 1977
Career orientation	Gannon & Hedrickson, 1973
Involvement	Beehr, Walsh, & Taber, 1976
Job involvement	Green, 1967; used by Reitz & Jewell, 1979
Other subscales of work ethic values	Wollack, et al., 1971
Organizational involvement (alienative, calculative, moral dimensions)	Etzioni, 1961; Gould, 1979
Organizational identification	Miller, 1967

* Adapted from table by Morrow (1983), with additional items added.

Source: Morrow, P.C. (1983). Concept redundancy in organizational research: The case of work commitment. *Academy of Management Review*, 8, 486-500.

Added Item

emphasis, of course, will be placed on the discussions of, (a) Petty's (1990) Occupational Work Ethic Inventory, and (b) Mirels & Garrett's (1971) Protestant Ethic Scale.

An older instrument which has seen much use is Super's Work Values Inventory (Super, 1969). It was designed to assess the importance of 15 satisfactions identified by Super that seventh-grade through adult men and women seek to fulfill through work. Evaluated are: creativity; management; achievement; surroundings; supervisory relations; way of life; security; associates; esthetics; prestige; independence; variety; economic return; altruism; and intellectual stimulation. Hill (1993) commented that Super's work and related research investigates worker satisfaction with employment, rather than focusing on the work ethic.

The Pro-Protestant Ethic scale (PPE) is a frequently-used instrument for purposes of comparison with other work ethic measures (Blood, 1969). Morrow (1983) stated that the essence of this concept is the belief that hard work is intrinsically good and an end in itself, and therefore this concept is similar to that of the Mirels and Garrett (1971) concept. Morrow's (1983) excellent facet analysis of work commitment constructs provided a superior source for comparing the above two instruments. She rated the epistemic correlation (i.e., the linkage between a conceptual definition and its measurement procedure) of the Mirels & Garrett instrument as good, whereas she rates the Blood instrument as being only fair. This discrepancy is due mainly to the fact that four of the items in the 8-item Blood instrument are reversed items. A factor analytic examination and study of the Blood instrument by Aldag & Brief (1975) suggested that two dimensions exist, a pro-Protestant ethic and a non-Protestant ethic. Aldag & Brief

(1975) also looked at the relationship between the Protestant Work Ethic (PWE) as measured by the Blood scale and certain work values, which are affective responses, perceived task dimension, perceived leader behavior, and higher order need strength. PWE beliefs were significantly correlated with internal work motivation and growth satisfaction as well as higher order need strength. Furnham & Koritsas (1990) cited a Spearman-Brown reliability figure of 0.70 for the Blood instrument, and cite one study which provides evidence of concurrent validity, and three studies which provide evidence for predictive validity. Morrow cited reliability alpha values of .70-.71 for the Blood instrument, she notes that the Mirels and Garrett (1971) measure of work ethic endorsement has generated stronger evidence of reliability, and suggested that the relative determinants for the Blood instrument are primarily a function of personality and secondarily a reflection of culture. She also stated that this concept appears to be relative permanent over one's life course, and that the means of influence for the concept would involve cultural/social change.

Another work ethic scale identified by Morrow (1983) in her facet analysis of work commitment constructs as having a value focus is Buchholz's (1978) work ethic scale. As originally conceived in 1977, Buchholz separated the two subscales of his Work and Leisure Ethic scale (WLE), the Work Ethic subscale and the Leisure Ethic subscale, into separate measures in 1978. The 1978 Work Ethic scale contains seven items and the 1978 Leisure Ethic scale contains eight items. Although more interest seemingly has been directed toward the leisure ethic half of the pair, the work ethic half has generated some interest for purposes of comparison with other work ethic scales in

order to investigate convergent and divergent validity issues. One item of interest related to this instrument is Furnham & Koritsas's (1990) content analysis of seven protestant work ethic scales, which revealed that five of the seven items in the scale were coded as representing the concepts of independence and self-reliance. The Mirels & Garrett (1971) had no items which coded on this category, and most of the other scales had no items which coded on this category either.

Two published studies which performed correlational analyses between the Buchholz (1978) and Mirels & Garrett (1971) scales reported Pearson product-moment values of .44 and .45 (Furnham, 1990a; Furnham & Koritsas, 1990). According to Furnham & Koritsas (1990a), the "... profile of the PWE believer then is of an independently minded, competitive, hard-working individual who is prepared to persevere at a task to achieve desirable ends" (p.44). The ideas of independence and self-reliance may be found to be more important in the future, as studies focus less on work ethic beliefs and individual differences, and focus more on work ethic beliefs and actual work behavior.

A few work ethic concept measures were generated or produced during the 1980's; however, most work ethic instruments were developed over twenty-five years ago. Among the more recent instruments are Ray's (1982) Eclectic Protestant Ethic, Ho's (1984) Australian Work Ethic; Wayne's (1984) Protestant Ethic and Contemporary Work Values; and Petty's (1990) Occupational Work Ethic Inventory. As discussed earlier in this chapter, the value and definition of what is generically called the work ethic has undergone a transformation from the foundations of the concept as it was originally

conceived and applied during the agrarian and industrial periods of history. These instruments were developed in order to better match the conditions of the modern workplace and the exigencies of the modern worker in the information age.

Ray's (1982) Eclectic Protestant Ethic was developed primarily to measure the Protestant Ethic of Australians. The scale has 18 items, of which 9 are reversed. A content analysis performed by Furnham (1990a), using seven coding categories, revealed that 6 of the items were categorized as being related to spiritual/religious beliefs, and 7 items were categorized as being related to morals. A search of the literature did not uncover any studies which have utilized this instrument. Furnham and Koritsas (1990) reported a Cronbach Alpha figure of .82, and indicated that this is an acceptable level of reliability. They also reported that this instrument has been shown to have concurrent and predictive validity. An intriguing aside to this discussion is Ray's publication output - a computer search revealed 136 entries for the period of 1990-1996. Much of this psychologist's work has focused on personality traits and measures, with an associated number of publications related to the validity and design of such measures.

The Australian Work Ethic survey is another scale designed to tap adherence to the Protestant work ethic ideology in Australia. This measure was designed by R. Ho and J. Loyd (Ho, 1984). Items for the scale were selected on the basis of factor analysis and item-total correlations. Through an adjunct validation study, evidence was found for convergent and concurrent validity. Furnham (1990a) reported that 5 of the 7 items comprising the scale were coded as being related to the concepts of hard work and success, which may be compared to 8 of 19 items coded as belonging to this category for

the Mirels and Garrett (1971) Protestant Work Ethic scale for the seven categories used. Furnham and Koritsas (1990) report a Cronbach Alpha value of .76 for the instrument, which could be interpreted as being indicative of moderate evidence of reliability. Furnham and Koritsas (1990) further reported a correlation figure of .61 between the Protestant Work Ethic (PWE) (Mirels & Garret, 1971) and the Australian Work Ethic (AWE) (Ho, 1984) scales. Of the seven Protestant Work Ethic scales used in the Furnham and Koritsas study (a content, correlational, and factor analytic study of seven questionnaire measures of the Protestant Work Ethic) (1990), the Mirels and Garret (1971) and the Ho (1984) scales overlapped the most with the other measures (the PWE correlated with all seven measures, the AWE correlated with 6 of the seven measures).

As discussed earlier, many forms of work commitment have been produced in an attempt to better describe an individual's commitment to work. Morrow (1983) has grouped more than 30 work commitment constructs into 6 groups or clusters according to their major focus. Her six groups were: value focus, career focus, job focus, organization focus, union focus, and a sixth group labeled combined dimensions of commitment. These categories or forms of work commitment represent concepts which, in general, have narrowed the definition of what work commitment may mean, connote, or suggest.

Wayne (1984), contended that the values and ideals that individuals possess concerning work have undergone transformation, modification, or reformation during last few decades, developed an instrument to measure adherence to both the Protestant Ethic and more contemporary work values. His argument for developing an instrument which could possibly gauge or assess individual's attitudes towards both the Protestant ethic and

a more contemporary ethic can be seen in this quotation from his dissertation:

An ethic by its very nature is a collection of values that are internally consistent which both describes and guides the activities of individuals. The Protestant Ethic refers to an identifiable, established collection of values that is internally consistent and imposes obligations on individuals by the society adhering to this Ethic. As part of this Ethic, individuals have a moralistic basis for choosing work as a 'calling' under which they meet obligations to God, thereby earning a place in heaven (p.11).

In modern times, however, more contemporary work values have appeared where individuals feel 'right' about work in terms of individual choice and self-determination, rather than being made to feel 'righteous' through work seen as the as the fulfillment of societal obligations (p.78).

Wayne's (1984) rationale for the development of an instrument which could measure both Protestant and contemporary work values is two-fold. First, citing Dunn (1979), differences occurring between individuals due to two generational value systems, the old (traditional) and new (contemporary), are becoming one of the significant management problems of our time. This view was held by Haney (1980) as well, who asserts that members of the labor force now hold different sets of work values than those of previous generations. Secondly, workers themselves could benefit from a means to precisely identify what their work orientation is, as well as that of others, so that conscious or unconscious conflicts due to a perceived work attitude difference could be lessened or reduced, through improved communication.

Wayne's (1984) instrument to measure adherence to the Protestant Ethic and contemporary work values consisted of 119 descriptors of the Protestant Ethic and contemporary work values. A 5-point Likert-like scale is used to indicate the extent of agreement or disagreement with statements written to represent either the Protestant Ethic or contemporary work values. Internal consistency (K-R 20) reliability coefficients were computed to be: .97 (whole-test), .96 (Protestant Ethic subscale), and .91 (contemporary work values). Test-retest correlation coefficients were determined to be: .79 (whole-test), .83 (Protestant Ethic subscale), and .74 (contemporary work values subscale). Wayne is to be highly commended for his enormous effort at ascertaining both reliability and validity for his instrument. Especially noteworthy is his use of factor analysis to determine not only if two, mutually exclusive ethics exist (i.e. Protestant work values, and contemporary work values), but also if other, internally consistent sets of work values may exist.

The Protestant Ethic Scale

The Protestant Ethic Scale was developed by Herbert L. Mirels and James B. Garrett at Ohio State University, and was first published in 1971 (Mirels & Garrett, 1971). The scale is comprised of 19 items. However, in practice the actual instrument used to gather data contains 30 items - items 1, 2, 5, 7, 9, 11, 13, 15, 18, 19, and 22 are fillers (see Appendix A).

The essence of the definition for the Protestant ethic concept is the belief that hard work is intrinsically good and an end in itself (Morrow, 1983). Correlation between the Protestant Ethic Scale and the Internal-External Scale (Rotter, 1966) were found to be

highly significant, with an r value $-.30$, with a $p < .001$, indicating that Protestant Ethic disposition is positively associated with a high locus of control (Mirels & Garrett, 1971). This inclination can be said to parallel that aspect of the Protestant Ethic which asserts a causal relationship between effort expenditure and success. A study by Merrens and Garret (1975) investigated the relationship between PWE and actual work behavior. Maintaining that the PWE holds that hard steady work is itself worthy, and unwillingness to work is seen as a symptom of absence of grace or as sinful, they designed an experiment in which subjects were asked to perform a boring, repetitive task. As predicted, they found that high PWE scorers spent significantly more time in such a task, as compared to low PWE scorers. A replication study by Ganster (1981) did not conclude with a similar result. It was argued that Merrens and Garret's task was not representative of real jobs, and their experiment may have induced apprehension evaluation and hence biased the result. Furham (1990a) asserted that the PWE has been demonstrated to be related to, but distinct from other psychological variables like locus of control or need for achievement. "It is probably the moral overtones in the PWE which give it its discriminant validity over other psychological measures and which made it such a powerful predictor of work beliefs and behavior (Furnham, 1989, p.22).

The Protestant Ethic scale appears to be a commonly-used instrument for purposes related to work commitment research. Its' popularity probably stems from the fact that it contains only 19 items which utilize an easily-understood Likert-type scale. There is evidence of reliability and validity for this instrument as well. Furnham & Koritsas (1990, p.48) identified studies which provided various figures related to reliability

estimates: Spearman-Brown, 0.67; Kuder-Richardson, 0.79; Cronbach Alpha, 0.70.

Morrow (1983) identified five reliability estimates, which yielded Spearman-Brown values from .67 to .80 and alpha values around .80. Morrow and McElroy (1986) report a Cronbach alpha coefficient of 0.81.

Evidence of validity may be assessed from several viewpoints. Venkatraman & Grant (1986) identify five components of validity which are commonly recognized: content validity, internal consistency, convergent validity, discriminant validity, and nomological or predictive validity.

Furnham & Koritsas (1990) cited the 1975 Merrens & Garrett study as evidence of concurrent validity. Evidence of content validity for the Protestant Ethic Scale was found in two research articles which focused specifically on issues related to construct validity for the work ethic concept. Morrow, Eastman, & McElroy (1991) assessed the validity of five work commitment concepts via content analysis, with a focus on the effects of rater naivete and concept redundancy. The idea of rater naivete becomes important due to the data-gathering paradigm utilized by researchers (and/or their data-gatherers). Data-gatherers use a priori analytical categories in order to uncover potentially generalizable knowledge (Evered & Louis, 1981). This, in effect, causes respondents (also; judges, raters, etc.) to concentrate on certain features of the situation under study. Concept redundancy is extremely important, and is one the core issues affecting construct validity. Although much can be said regarding redundancy, it is sufficient at this point to state that an academically naive rater would seem to have a more difficult time categorizing ambiguous concepts into a schema, and this is what Morrow,

Eastman, & McElroy (1991) found in their study. They also concluded, however, that the Protestant Ethic, as defined by Mirels & Garrett (1971) was a robust measure, in that it had high percentages of correct classifications in a content analysis among three levels of raters: researchers, undergraduates, and employees. Specifically, for the Protestant work ethic scale, which was used by the authors of this study, the percentage of correct classifications were: 77.4%; researchers, 67.8%; undergraduates, 54.7%; employees. As related by Morrow, Eastman, & McElroy (1991), there are no established guidelines specifying the level of agreement necessary to avoid judgements of redundancy. However, Lawshe (1975) contended that there is evidence of content validity when over half of a group is in agreement. Smith and Kendall (1963) suggested a 60% cutoff; Furnham and Henderson (1983) have argued for 80% in their research.

For this study, the Protestant Ethic Scale has been shown to be content valid to a high degree. Additionally, the Protestant work ethic items demonstrated some redundancy with the concepts of job involvement (Lodahl & Kejner, 1965) and work as a central life interest (Dubin, 1956).

Another study which examined the content validity of the Protestant Ethic Scale was performed by Furnham (1990a). This study set out to compare and contrast seven questionnaire measures of the Protestant Work Ethic by content, correlational, and factor analysis. Because there is considerable evidence to suggest that the PWE is a multi-dimensional concept, and each of the scales used in the study were unidimensional (i.e., yield a single score on a high-low dimension of belief in the PWE), it was decided to do a content analysis, utilizing seven categories derived from both a review of the literature,

and also a quasi Q-sort technique. As stated by Furnham (1990a):

The content analysis serves particularly to aid in the labeling of the factors revealed by the factor analysis while the correlational analysis serves mainly to confirm the content analysis. Despite other correlational analyses on various PWE measures, they do not on their own inform one about the convergent-discriminant validity of the measures if indeed they are multi-dimensional (p.385).

Thus, it is important to examine the dimensional structure of a scale, using as many methods as prudently possible. Concerns related to convergence, for instance, may be alleviated by looking at not only item overlap (through the use of a correlational analysis), but by also examining the extent to which items tap different dimensions or facets of the same concept (Furnham, 1990a, p. 386).

The content analysis in the Furnham (1990a) study was performed primarily to establish item overlap between questionnaires and the dimensions being tapped by them. The reliability of the three raters was $r=0.87$ on the first attempt, but an $r=.97$ was obtained after items over which disagreement had occurred were resorted.

The correlational analysis of the Furnham (1990a) study confirmed the suggestions of overlap of questionnaire items of the content analysis. The largest correlations were between the Mirels & Garrett (1971) Protestant Work Ethic (PWE) and the Hammond and Williams (1976) Spirit of Capitalism (SOC) (.60), the Mirels & Garrett (1971) PWE and the Ho (1984) Australian Work Ethic (AWE) (.60), and the Hammond and Williams (1976) SOC and the Ho (1984) AWE (.59).

Five factors emerged from the factor analysis performed in the Furnham (1990a)

study, accounting for over a third of the total variance. Sixty-nine items (scale questions) were factor-analyzed. The first resultant factor had 27 items (from the seven scales) which had factor loadings of 0.30 or greater. All seven scales had items which loaded on this factor, which is considered to be the fundamental dimension underlying the Protestant Work Ethic: respect for and willingness to take part in hard work. The Mirels & Garrett (1971) 19-item PWE scale includes 10 items related to this factor.

The second factor which emerged dealt with the role of leisure, and accounted for 7.5% of the variance. All three leisure items in the PWE (Mirels & Garrett, 1971) loaded on this factor. The fifth factor which surfaced from the factor analysis stressed ascetism and the damages of having too much money. The PWE contained five items (26%) which were associated to this factor. The other two factor which emerged from this factor analysis, but were not represented in the PWE, described religious or moral beliefs, or stressed independence from others.

Furnham (1990a) argued that all of the above five factors seem to be fundamental to the PWE as it was originally conceived. Although the Mirels & Garrett (1971) Protestant work ethic scale does not cover all of these factors or facets, it does contain porportionally more items which represent the heaviest loading in the above factor analyis, namely the factors representing hard work and leisure. As attested by Furnham, since some of the five factors did not account for much of the common variance, it it not known whether these given factors should be given equal weight in an all-inclusive scale. Also, as mentioned above, the Mirels & Garrett (1971) instrument was shown to correlate more highly with supposedly comparable instruments. Taken in toto, this provides for

excellent evidence of content validity, given that this is a unidimensional measure. The above comparison using content, correlational, and factor analyses is impressive, as it helps one to grasp the interconnectedness of validity components. As stated by Furnham (1990a): "Convergent, discriminant, and nomological validity are related issues in construct validation, but they are nevertheless unique. By contrast, the replication of a finding using different PWE measures is a testament to their robustness" (p. 396). The Mirels & Garrett instrument has seemingly been employed in more studies than any other work ethic instrument, given the evidence of Furnham & Koritsas (1990) and from a search of the ERIC CD-ROM database. It was utilized specifically to confirm convergent validity for Ho's (1984) Australian Work Ethic instrument.

The Occupational Work Ethic Inventory (OWEI)

The Occupational Work Ethic Inventory was developed and tested by Petty (1991a). As it is normally used, the OWEI instrument consists of three segments. The first segment introduces the instrument, provides instructions for the participant, and assures confidentiality. The second segment represents the scale of 50 items. And the third segment is generally attached in order to gather demographic information from the respondents (See Appendix A). The following narrative supplies information regarding the development and use of the instrument.

The OWEI is based in part on the original work of Dr. H. C. Kazanas at the University of Missouri in 1977-1978. Dr. Kazanas' (1978) empirical investigation was related to affective work competencies and work values, with an emphasis on how to measure them. Thus, the Affective Work Competency Inventory (AWCI) was published

in 1978. Using this scale, a study by Petty (1979) showed that the attitudes towards work differed between workers, supervisors, and vocational educators. Later, research by Petty and Morgan (1980) resulted in the identification of 63 affective work competencies, which could be grouped into 15 clusters.

The Affective Work Competencies Inventory was factor-analyzed by Brauchle, Petty, and Morgan (1983), utilizing the responses of a sample of 1,485 industrial workers, supervisors, and vocational educators. It was found that five factors accounted for 76.3 percent of the instrument's variance (p.605). The content of the groupings which comprised these factors were studied, and the five factors were labeled (a) Ambitious, (b) Self-control, (c) Organization, (d) Enthusiasm, and (e) Conscientiousness. Kuder-Richardson (KR-20) estimates of reliability were computed to range from .64 to .89 respectively, and were considered to be "...within the range normally considered acceptable for instruments in development" (Brauchle, Petty, & Morgan, 1983, p. 607).

Utilizing the affective work competencies phrase list extracted from a population of workers, supervisors, and vocational educators (Petty & Morgan, 1980), Petty then set out in 1990 to develop a new instrument which could use these terms to measure work ethic characteristics directly related to a person's work. A panel of subject-matter experts were used to establish content validity through a form of semantic analysis, which entailed the categorization of simple one- or two-word descriptors into groups. Independent categorization and re-categorization took place until a consensus was reached (Petty, 1991a). The resulting clusters were labeled Dependable, Ambitious, Considerate, and Cooperative. A 1995 study by Petty gave four clusters: interpersonal

skills, initiative, being dependable, and reversed items. An anchor or stem phrase of "At work, I can describe myself as:" was added to direct the participant to their responses. A Likert-type scale was provided for rating participant standards for each item: 1 = Never; 2 = Almost Never; 3 = Seldom; 4 = Sometimes; 5 = Usually; 6 = Almost Always; and 7 = Always. A pilot study was undertaken later in the year. A coefficient alpha estimate of internal consistency was computed to be .95 (Petty, 1991b). As a result of this pilot analysis, all 50 of the OWEI items were left intact. A pilot study by Hill (1993) of 135 college students and staff employed in a small four-year liberal arts college was conducted in order to check the internal validity of the OWEI instrument. A computed coefficient alpha was .94.

Since 1990, numerous studies have been undertaken in order to measure work ethic attitudes using the OWEI, or investigate issues related to the instrument's validity. The following discussion focuses on issues pertaining to the validity of the instrument; a separate section will discuss research findings related to work ethic research in which the OWEI has been utilized. One of the first studies to utilize the OWEI instrument was undertaken by Hill (1993). The purpose of the study was to determine if there were significant differences in the work ethic of workers categorized by Standard Occupational Classification (SOC), level of education, age, gender, years of full-time work experience, or empowerment. This study was unique in that it utilized respondents from randomly selected workplaces, covering a wide range of occupations, instead of the more commonly seen convenience samples. A multivariate analysis of variance procedure revealed significant differences in work ethic for all of the above groupings. Further

analysis using a Fisher's protected LSD procedure was employed in order to determine precise differences for each of the independent variables. Differences for the four dimensions of the work ethic represented by the subscales of the OWEI were found for SOC, education, gender, work experience, and empowerment.

In the above 1993 study by Hill, the OWEI was found to be internally consistent and highly reliable, based on a computed coefficient alpha of .95. Correlation coefficients were also calculated for the four subscales or theoretical constructs of the instrument. These values were Cooperative = .72, Ambitious = .75, Dependable = .86, and Considerate = .87. These figures also provide evidence of high reliability.

Hatcher (1994), in preparation for a study using the OWEI instrument, performed a principle factor analysis on data utilized in Hill's (1993), Petty's (1995a), and Hill & Petty's (1995) studies. The promax method of rotation was used (SAS Institute, 1985), which provided both orthogonal and oblique rotations of the data. Hatcher (1994) stated that "...factor analysis enabled the researcher to determine whether underlying patterns of mathematical relationships existed that were similar to the subscales identified by the semantic method" (p. 63). It was concluded from the factor analysis that the OWEI instrument's 50 items and four subscales did not load on multiple factors, but loaded on one factor. This provided evidence of unidimensionality for the instrument.

Petty apparently developed a shortened version of the OWEI called the Occupational Work Ethic Inventory-Revised (OWEI-R), although little information was uncovered concerning it (Petty, 1995b). Hollingsworth (1995) used this instrument in conjunction with the Leadership Orientation Survey by Bolman and Deal (1991) to

investigate the leadership characteristics and work ethic of Tennessee Agricultural Extension Service home economists. It is explained that an exploratory factor analysis on later research by Petty resulted in three elements or factors, which Petty labeled: (a) interpersonal skills, (b) initiative, and (c) dependability. The OWEI-R uses a five-point Likert scale, and consists of 23 items, which were gleaned from the 50 items which make up the original OWEI. According to Hollingsworth, a Coefficient Alpha was conducted to establish internal reliability, and the revised instrument achieved a measured Coefficient Alpha of .95 (Hollingsworth, 1995, p. 57).

Even later, a factor analysis was performed by Hill and Petty (1995) in order to identify key themes which characterize the occupational work ethic and further refine the Occupational Work Ethic Inventory (OWEI). The study utilized the 50 descriptive terms contained in the original OWEI instrument, with participant scoring using the 7-item Likert-type scale. The population for this study consisted of a random sample of 285 businesses and industries (selected from a master database of 1,011) workers in public and private businesses and industries in a single geographical area in the southeastern United States.

Initially, a principle-components analysis was performed, using squared multiple correlations. "To eliminate error variance that would be included along with common variance and specific variance at this stage, Kaiser's criterion was applied prior to factor rotation, thus retaining only those factors with an eigenvalue of 1.0 or greater (Hill & Petty, 1995, p. 64). The principal-components analysis yielded 4 factors which met the Kaiser's criterion. A scree test was also performed, and rendered a four-factor solution.

Finally, orthogonal rotation using the Varimax procedure was employed, in order to minimize the number of loadings on a factor, which enabled the researcher to more easily interpret the resulting list of constructs produced via the factor matrix procedure.

A .30 minimum factor loading criterion was set. Approximately 10% of the variance for a corresponding variable was explained by a factor (Tinsley & Tinsley, 1987). The result was a four-factor solution which collectively explained 48 of the 50 items contained in the instrument, and which accounted for 38.86% of the variance (Hill & Petty, 1995, p. 65). The labeled factors were:

Interpersonal Skills - comprised items which related to working relationships with other people and the general concept of cooperation;

Initiative - incorporated items which dealt with the idea of ambition, "moving up the ladder", and adherence to a difficult job situation;

Being Dependable - included items which had to do with fulfilling the (minimum) expectations of the employer for satisfactory job performance, including such things as punctuality and honesty; and lastly,

Reversed Items on the instrument - This factor was made up items which were reversed and stated in the negative on the OWEI in order prevent participants from developing an unacceptable response pattern.

Two important comments should be made regarding the above four-factor solution to the OWEI instrument. First, as discussed by the authors, the identified factors labeled interpersonal skills, initiative, and being dependable can be used as a guide for instructors attempting to embed consideration of work ethic throughout an educational

program or curriculum. Hill and Petty (1995, p.69) provided a scoring worksheet for this purpose. Secondly, and more importantly from a research perspective, is the importance of including the fourth factor consisting of reversed items on the OWEI. According to Petty (G.C. Petty, personal communication, June, 1996), consideration was given to assuming a three-factor solution to the OWEI (See Hollingsworth, 1995), but this corrupts and invalidates the solution derived from a factor analysis which includes the reversed items. It also fails to recognize the possibility of negative reinforcement supplied by the consideration of such items. Therefore, it would seem to be foolish to refrain from considering the value of the reversed items in teaching about, studying, or otherwise contemplating work ethic(s). NOTE: These four factors (a) Interpersonal skills, (b) Initiative, (c) Being dependable, and the (d) Reversed items on the instrument represent the subscales of the OWEI that are to utilized in this study.

Research Studies Which have Utilized the Occupational Work Ethic Inventory

The following discussion involves studies which have utilized the OWEI to investigate issues related to work ethic or commitment. It is important to note that the original OWEI instrument (which incorporates the subscales of dependable, ambitious, considerate, and cooperative) was used in all of these studies, except where noted.

Hill (1993) undertook a study to determine if there were significant differences in the work ethic of workers categorized by Standard Occupational Classification (SOC), level of education, age, gender, years of full-time work experience, or empowerment. The population for the study consisted of workers employed by public and private business and industry in a county in Tennessee. A random sample of 285 businesses and

industries (from a list of 1,011) were selected for inclusion in the study; 158 agreed to participate. A total of 1,840 instruments were distributed and 1,201 completed instruments collected for a response rate of 65.3% for the sample. Significant differences were found all categories except age. Further examination using a Fisher's Protected LSD procedure was utilized to determine within-groups differences.

Among the more easily interpreted findings were those related to the level of education and gender groupings. The mean subscale scores of workers grouped by level of education increased sequentially for the subscale of *ambitious*. Significant differences were not found for the subscales of *dependable*, *considerate*, or *cooperative*. Level of education was partitioned as follows: group 1 - less than a high school diploma; group 2 - high school degree or GED; group 3 - two years of college or Associate's degree; group 4 - Bachelor's degree; group 5 - some graduate work. Females scored significantly higher than males on all four of OWEI subscales. Mixed findings for the variables of full-time work experience and empowerment do not appear to lend themselves to useful interpretation.

A study surveyed the occupational work ethic, using the OWEI, of vocational education students in east Tennessee (Allender, 1993). Categories of investigation were occupational training area, gender, grade level, hours worked per week, and socio-economic status. From the 35 counties designated as East Tennessee, 15 school sites located in eight counties, were selected. Findings were based on 3,228 surveys, representing a 98.98 percent response rate. Partial correlation coefficients for the OWEI subscales were calculated, and the procedure verified that the data on each level of the

independent variables were appropriate for multi variate analysis. A Hotelling-Lawley Trace multi variate analysis procedure was implemented, and significant differences were indicated among the levels of each of the five demographic characteristics investigated for work ethic scores. Testing for significant differences in the OWEI subscales was achieved via an ANOVA test for each of the categories.

Among the findings of the Allender (1993) study were the following:

1. Females scored significantly higher than males on all four work ethic subscales of the OWEI.

2. Over half of (53.6%) of vocational students surveyed were not employed.

Those students who worked 21 or more hours per week scored significantly higher on the subscales or dimensions of dependable, ambitious, and cooperative than students in other levels.

3. Although 73.2% of students were classified as belonging to the middle (socio-economic) status group, those belonging to the upper status group scored significantly higher on all four subscales, and lower status students scored the lowest on all four subscales (p. 55).

Watson (1993), using the OWEI, compared the self-perceived occupational work ethics of general education and tech prep students, by gender, grade level, and work status. The population for the study was students enrolled in a high school in northeast Tennessee. A random sample of 100 students from each secondary curriculum, General or Tech Prep, was generated; 107 completed instruments were collected for a response rate of 53.5%.

No significant differences were found to exist for the three independent variables studied. However, the researcher cautioned that teacher, parental, and/or community influences may have obscured findings.

A study by Hatcher (1994) examined the work ethic of apprentices and instructors in a trade union apprenticeship training program. Subjects were either apprentices or instructors in the International Brotherhood of Electrical Workers and National Electrical Contractors Association (IBEW-NECA) apprenticeship training program. There were 4096 instruments collected from a sample of 4489 participants. Independent variables investigated were occupation (job title), job specialization, years participating or years instructing in the program, and years of full-time work experience.

The study revealed that there was a significant difference in work ethic for participants in the categories of occupation and job specialization. The author suggested that these differences may be due to the maturity of older instructors, more humanistic characteristics of younger apprentices, and the definitions of job specializations. One interesting and statistically significant finding was the interaction effect of years of participating or teaching and years of full-time work experience. Participants in the first years of the program (years one and two) scored higher on work ethic than those in later years (three, four, and five) of the program.

A study by Petty & Hill (1994) explored the occupational work ethic of women and men. Gender and occupational type, using the Standard Occupational Classification (SOC) aggregate groupings recommended for research use by the Office of Federal Statistical Policy and Standards (U.S. Department of Commerce, 1980) were the

independent variables utilized via an ex post facto research design. The results were based on a random sample representing more than 200 industries. Approximately 3600 instruments were distributed and 2,200 were utilized, representing a response rate of 62%. There were 1,284 useable responses from females, and 936 from males. Women tended to be more heavily concentrated in occupations classified as technical, clerical, or sales and men were more evenly distributed across the SOC aggregate groups. A multivariate test for gender, using the Hotelling-Lawley Trace, was significant at the .05 level, so a univariate test (ANOVA) was used to detect if there were significant differences in responses for each OWEI subscale. The calculated results revealed that females scored higher than males for every subscale (i.e. dependable, ambitious, considerate, and cooperative).

In the Petty & Hill (1994) study, the Hotelling-Lawley Trace was also used to probe the issue of whether occupational classification could induce interaction effects with gender. Although the two-way MANOVA indicated significant differences, univariate F tests failed to detect significant interaction effects for any of the subscales. The Hotelling-Lawley Trace did reveal occupational type to be a significant predictor of work ethic, and a Fisher's least significant difference (LSD) procedure was to make all pairwise comparisons for each OWEI subscale.

Petty and Hill (1994) stated that women exhibited a stronger work ethic than men, which is consistent with findings of other researchers (Hall, 1990, 1991; Hill, 1993; Miller, 1980; Wayne, 1989). The research of Lyson (1984) and Miller (1980) was cited as evidence that women have different expectations from work. The importance of

stressing these affective factors in the areas of teaching and vocational guidance, and especially the idea of helping students assimilate these factors are provided as important implications for this study.

A study by Hollingsworth (1995) examined the roles, together and separately, of leadership orientation and work ethic. The study utilized the entire population of 183 Tennessee Agricultural Extension Service (TAES) home economists. This research was based largely on the idea that both leadership effectiveness and work ethic are each partially a function of worker (follower) perceptions.

Instrumentation for the Hollingsworth (1995) study included a modified version of Bolman & Deal's (1991) Leadership Orientation Survey (LO), Petty's Occupational Work Ethic Inventory - Revised (Petty, 1995b), and a third section which gathered demographic information. NOTE: the OWEI-R instrument used in this study is a shortened, three -factor or subscale instrument, and is not to be confused with the OWEI instrument commonly used.

Although eleven research questions were developed to guide the study by Hollingsworth (1995), fundamentally the issue at hand was to probe the notion of how leadership orientation and work ethic may be correlated. It was discovered that home economists in the TAES tended to favor: (a) The Human Relations orientation to leadership (orientations, frames, or perspectives on leadership as delineated by Bolman & Deal (1991); (b) Structural, which emphasizes goals and efficiency; (c) Human Resources, which describes people who focus their attention on human needs; (d) Political, those in leadership positions who view organizations as arenas of conflict

and competition, where all players are battling for scarce resources; and (e) Symbolic, a frame or perspective held by those who believe that symbolic forms such as myth, ritual, ceremony, and stories provide the avenues through which organizations can change).

With respect to the three dimensions of work ethic, it was discovered that the participant home economists emphasized the factors of (a) Dependability and (b) Interpersonal Skill, with the third OWEI-R subscale, factor, or dimension of (c) Initiative being clearly distinguished as being the least important.

Two of the conclusions provided by Hollingsworth (1995) are noteworthy. Because home economists in the TAES tend to favor a Human Relations orientation to leadership, one would logically expect that they would emphasize the Interpersonal Skill dimension of work ethic as delineated by Petty (1995b). In actuality, the economists studied placed about equal importance on both Dependability and Interpersonal Skill. The rationale for this anomaly provided by Hollingsworth was that the population draws a distinction between the descriptors provided in the two instruments as indicative of the Human Relations dimension of leadership orientation and the Interpersonal Skill dimension of work ethic. The second major conclusion made was that positive work ethic is a good predictor of leadership effectiveness - predicting approximately the following variation in the leadership orientation subscales (using the mean score of the three subscale scores of the OWEI-R): Structure, 38%; Human Relations, 35%; Political, 48%; and Symbolic, 40%.

Three studies were published by Petty in 1995 (1995a; 1995c; 1995d) that apparently used the same population/sample, but which focused on disparate

demographics. The population for these studies consisted of workers from the mid-south region of the United States. From a master list of businesses and industries in the community, a sample of approximately 3600 possible participants was developed, utilizing a random block design which included 200 industries. There were 2,232 observations used in the analysis due to no returns or missing values. The instrument used to gather data, the statistics used to analyze the data, and other incidentals of research were essentially the same as those used in the Petty & Hill (1994) study discussed earlier.

In one study, Petty (1995c) studied the impact that education might have on, or be reflected in, one's work ethic. Rationales given were based both on the idea that differences in work attitudes and values are influenced by education (Cherrington, 1980, p.15), and on the idea that salient differences in work ethic by educational level of workers can also affect the type of training workers should receive (Hall, 1990). Five levels of education were used: less than a high school diploma; high school degree or GED; 2 years of college or Associate's degree; a Bachelor's degree; or some Graduate work. The salient finding of the study was that more highly educated persons were scored as having higher levels of work ethic. This finding holds somewhat true for all four dimensions of the OWEI (Dependable, Ambitious, Considerate, and Cooperative), but seems to be especially germane to the dependant variable of ambitious. Although it is not known how the notion of self-esteem may factor into the situation, it would seem to be apparent that the factor of ambition would impact a worker's future success on the job or in life.

In another study, Petty (1995a) examined the demographic characteristic of age in comparison to work ethic scores on the OWEI. Workers from five age groups: 19 or under; 20 - 26; 27-35; 36 - 55; and over 55, were identified from several occupational areas. It was found that the OWEI dimension of "Ambitious" was higher for the 36 - 55 age group.

The third study by Petty (1995d) investigated how a individual's self-rated perception of work ethic might differ by occupation. Grounds for undertaking the study included the importance of teaching attitudes, which are often neglected, as well as knowledge and skills. Evidence suggests that practitioners often have significantly different work attitudes than the teachers of the trade. The independent variables for this study were Standard Occupational Classification (SOC) aggregate group classifications, as defined by the U.S. Office of Federal Statistical Policy and Standards (U.S. Department of Commerce, 1980). The SOC aggregate group had six levels: (a) administrative, engineering, scientific, teaching, and related occupations, including creative artists; (b) technical, clerical, sales, and related occupations; (c) service occupations, including military occupations; (d) farming, forestry, fishing, and hunting occupations; (e) precision production, craft, and repair; and (f) operators, fabricators, and laborers.

NOTE: the dependent variables for this study consisted of the four dimensions of occupational work ethic represented by the subscales of the OWEI, but the names of the subscales were slightly altered, due to a factor analysis which was performed on the this data set. The subscales were as follows: working well with others, striving for

advancement/success, being dependable, and acceptance of duty.

Through an examination of job titles which comprised the sample, Petty (1995d), made the observation that the above six SOC classification groupings roughly correspond to generally known teaching areas in industrial-technical teacher education. For the persons represented by this data set, the analysis reveals that self-rated work ethic does differ by occupation. Findings related to each of the teaching areas are discussed by the author. Each teaching area group appeared to rate one or more of the dimensions of occupational work ethic as being more important; no one teaching group (SOC aggregate group) stressed all four dimensions equally. The primary implications of this study were stated to be the importance of teaching the proper attitudes which attend each occupational area, and the need for vocational guidance of students, that is, to better match student behaviors and attitudes with suitable occupational areas.

CHAPTER III

METHODS AND PROCEDURES

Introduction

Chapter I provided an awareness of the problem to be investigated. Chapter II was a review of the literature. This chapter provides an overall description of the sample selected for this study. Also included in this chapter are discussions of the procedures used in collecting data, and subsequent data analysis methods.

Subjects

Participants for this study were selected based on two fundamental criteria. One, respondents were required to be eighteen years of age, or older. Two, respondents were required to be either employed at least half-time, or were retired. These were considered to be the fundamental prerequisites for comparing work ethic scales intended for assessing level of work ethic for adult workers.

Since the purpose of the study was not to characterize the population, but rather to compare and factor analyze the two scales, the subjects were chosen from a sample of convenience. Participants for this study were blue collar factory workers and others, which helped to provide for a respectable cross-section of occupations. These were individuals who either receive or provide services related to work force development. More specifically, to reduce effects related to location, the geographical area included individuals employed or residing in eight southeastern U.S. states: Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee.

The target sample of 800 was selected from a convenience sample comprised of

individuals employed in a variety of occupations. The sample size was selected in order to ameliorate any problems related to factor analyzing a data set in which a multi-item test is utilized (a ratio of 10:1 is recommended by Schwab, 1980, p. 23). The procedure utilized to collect the data was mail-return survey. Due to the nature of the study, that is, a comparison of one instrument's scores to another's, and due to the number of individuals involved, this procedure was recommended. The minimum required number of returns to conduct a factor analysis (quantity of $10 \times 80 = 800$) was exceeded. A total of 841 usable returns was achieved utilizing this method.

Research Design

This study was in essence a correlational study. Inferential statistics were used to estimate the strength of relationship between two measurement scales, namely The Protestant Ethic Scale (Mirels & Garrett, 1971) and the Occupational Work Ethic Scale (Petty, 1990). Data were collected through the survey method, via a composite instrument consisting of the two discrete questionnaires above. As in most construct validity studies, various statistical treatments are often applied to the resultant data set in order to maximize inferences. The approach taken varies from situation to situation. As Schwab (1980, p. 13) put it: "....a 'cookbook' guide to construct validation procedures is of limited value." Experimental manipulations will not be involved. The study may be considered "expos facto" in that the item of interest, namely work ethic, will be measured or examined in a historical context. It was analyzed, or otherwise investigated, after it had been measured.

Instrumentation

Instrumentation for the study consisted of two work ethic surveys that were combined for purposes of this study. These instruments were the Protestant Ethic Scale, as developed by Mirels & Garret (1971), and The Occupational Work Ethic Inventory, as developed by Gregory C. Petty (Hill & Petty, 1995). As each of the above instruments have been previously discussed in detail in the Review of Literature; the following discussion will be directed at a basic description, with scoring procedures and rationale for selection.

The Protestant Ethic Scale

The Protestant Ethic Scale (Mirels & Garret, 1971) consists of 19 items. However, 30 items were actually presented on the instrument, but 11 of these are fillers (see Appendix A). Items 1,2,5,7,9,11,13,15,18,19, & 22 are fillers, and were not considered in the scoring. Participants were asked to rate their personal attitudes to statements about work, education, and other issues, using the following response code: (-3) I Disagree Strongly, (-2) I Disagree Moderately, (-1) I Disagree Slightly, (+1) I Agree Slightly, (+2) I Agree Moderately, and (+3) I Agree Strongly. Individual item responses are converted to positive numbers by adding a constant of four to each response marking. The Protestant Scale is considered to be unidimensional in nature; therefore a total score for an individual's Protestant Ethic is obtained by calculating the mean of the 19 item responses. A letter certifying permission of use is included in Appendix B.

Data were treated as interval data for statistical purposes. Statistical treatment for similar types of instruments has been met with some criticism (Gardner, 1975).

However, Nie (1975) argued that measurement levels of many social science instruments fall somewhere between interval and ordinal data; a progression which he calls ordered metric. Labovitz (1970), speaking on this, stated that a small amount of error may result from interval treatment of ordinal variables, but this may be offset somewhat by the use of sensitive statistics with known sampling error.

An additional criticism may be leveled regarding the wording of the scale itself. While the scale does eliminate problems related to the inclusion of a neutral item, it may prove beneficial to modify the response category language to a scale in which the antecedent "tend to" may be added to the "agree" and "disagree" categories; as this wording may be viewed as either more comfortable or less objectionable (e.g., Disagree, Tend to Disagree, Tend to agree, Agree) (Frary, 1997). Frary (1997) stated that even for semantic differential items, four or five scale points should be sufficient.

Evidence of construct validity was discussed in the Review of Literature, and will not be repeated here. Also, as discussed in the literature review, reliability figures have been reported: Spearman-Brown .67 to .80 and Cronbach Alpha values around .80 (Morrow, 1983).

The Occupational Work Ethic Inventory

The second instrument to be utilized in the study was the Occupational Work Ethic Inventory (OWEI). See Appendix A. This is a proprietary instrument developed by Gregory C. Petty (1991a). Written permission to use the OWEI was obtained and a copy of the authorization is found in Appendix B.

This instrument is similar to the Protestant Ethic Scale (PE), in that it is based on

a Likert-type scale. A somewhat different approach is taken in the presentation of response items, however. The OWEI uses a stem of "At work I can describe myself as:", followed by the following scale for rating standards for each item: 1 = Never; 2 = Almost Never; 3 = Seldom; 4 = Sometimes; 5 = Usually; 6 = Almost Always; and 7 = Always. This scale is used in conjunction with a 50-item questionnaire which asks respondents to indicate the number that most accurately depicts their standards for each of the described occupational behaviors. Based on the responses, three elements, or subscales as Petty called them, are measured - Interpersonal skills, Initiative, and Being dependable (Hill & Petty, 1995). A fourth factor also was identified, which was comprised the reversed items on the instrument. Note that these names or labels are relatively new; almost all previous studies which have utilized the instrument reported findings using the previously specified dimensions or subscales of Ambitious, Dependable, Considerate, and Cooperative. The actual items, that is, the list of words that make up the test have not been changed (The labels of the subscales were changed to better represent the factors revealed via a factor analysis).

As noted for the Protestant Ethic Scale, concern may be felt for the use of statistical treatments of the resulting data set at the interval level, and for the use of a seven-item scale. These issues are of small concern for the same reasons as stated earlier. In addition, it may be argued that observation may be a superior method for assessing thoughts or attitudes (Aiken, 1994). However, Oppenheim (1992) argued that rater biases, and increased time and expense negate, in many instances, any advantages. Related to self-report studies, Argyris & Schon (1974) noted that subjects generally are

unaware of the theoretical bases for their actions; regarding observational studies, they argued that they rely upon researcher inferences of thinking processes based upon the observed actions. Jacoby (1988) asserted that surveys have been the traditional method of measuring attitudes about work, and that psychometrically sound surveys are based on scientific methods and utilize accepted statistical treatments for data analysis. Lastly, Ajzen and Fishbein (1975) argue that the measurement of attitudes with the same degree of precision as the behavior upon which it is based yields data that are reliable and highly predictive.

Data Collection

The following discussion is a delineation of the statistical procedures utilized on the data set obtained from a collection of the survey packets. Rationale is provided for each item. In addition, post-hoc analyses were undertaken to provide further insight into the issue of construct validity.

Participants for this study consisted of adults who either receive or provide services related to work force development. These individuals were employed in a wide variety of occupational settings. The geographical area of participation included individuals employed in Alabama, Florida, Georgia, Kentucky, North Carolina, South Carolina, and Tennessee. All participants completed a work ethic survey packet (see Appendix A), which included the PE scale, OWEI and a brief demographic questionnaire, and an information sheet. Packets for mail distribution were developed which would seem to be conducive to the average industrial setting. Time for this activity was in the range of 3 weeks to one month. Collection was initially via a point of contact

(supervisor, manager, etc.). This procedure provided for the bulk of the data set.

Additionally, in industries where large numbers of individuals failed to participate (one site in North Carolina was problematical), further effort was expended to encourage those individuals through a second-round mailing. This added another 5 weeks to the data collection process.

Optimum data analysis time requirements should have entailed approximately 3-4 weeks; however, ad hoc analyses provided further insight which lengthened this period. Follow up procedures necessary to achieve a critical number of returns for the complex analysis & statistical methods used, as previously explained in the **Subjects** section of this chapter, required the overall time of data collection to extend to six months.

Data Analysis Procedures

First, the normality of the distribution of the PE and OWEI scores were investigated, via a histogram, and an “eyeball” test. This is necessary in order to determine appropriate statistical procedures. It may be possible, however, even with a skewed population, to “normalize” the scores via a log transformation, if necessary (SPSS,1997).

Next, Cronbach’s Alpha was computed in order to estimate reliability. Reliability is the ratio of true, systematic variance, to total variance. This type of statistic is used to appraise the absence of measurement error in the scores. However, the “true” variance may reflect systematic contamination and/or fail to capture construct variance, and hence be deficient. Thus, as has been stated by many authors, reliability is necessary but not sufficient when ascertaining validity. Finally, various methods were utilized to inquire

into the idea of construct validity itself. These included Pearson correlation coefficients, factor analysis, and causal modeling equations.

CHAPTER IV

RESULTS

The purpose of this study was to investigate the construct validity of Petty's (1991a) Occupational Work Ethic Inventory (OWEI). Specifically, comparisons were made, utilizing Mirels & Garret's (1971) Protestant Ethic Scale (PE) and the OWEI. Statistical procedures used included bivariate correlations, factor analyses, and causal modeling equations.

Data Set

The sample utilized for analysis purposes was one of convenience. Essentially, this was a correlational and factor analytic study. No inferences were to be made regarding the participants views toward work ethics, or other latent construct. Participants for this study consisted of adults who either receive or provide services related to work force development. These individuals were employed in a wide variety of occupational settings. The geographical area of participation included individuals employed in Alabama, Florida, Georgia, Kentucky, North Carolina, South Carolina, and Tennessee. All participants completed a work ethic survey packet (see Appendix A), which included the PE scale, OWEI, and a brief demographic questionnaire (and of course, an information sheet). Delivery of the test packets was by either mail, or in person, to individuals and groups.

The OWEI/PE packets were distributed mainly via mail and personal distribution. Of these, 893 were distributed, and 855 packets were collected. Only 841 were accepted, as the others were either improperly marked or were incomplete on both instruments.

Those packets which had at least one of the two surveys completely filled-in were used. Furthermore, two methods were employed to cull those responses that would be obviously inappropriate. First, those questionnaires which exhibited a response pattern in which all responses were of the same value (e.g. all 7s on the OWEI) were rejected. Secondly, a computation utilizing three of the reversed items on the OWEI was used to reject those questionnaires which resulted in a score of "7" (i.e., "Always") for all three of reversed items (items: 13, irresponsible; 39, hostile; 44, careless). The result of these efforts consisted of 841 respondents.

Data Analysis

Fundamentally, it was believed that scores of the two instruments would be comparable, that is, they would exhibit a positive correlation. With this in mind, the first statistic computed was the Cronbach Alpha, which is a measure of scale reliability, or internal consistency, for each of the scales. The α for the OWEI was computed to be .93, and the α for the PE was computed to be .67 at the .05 level. Note: The α for the OWEI did not include items 2, 9, 13, 21, 24, 25, 26, 30, 34, 39, and 44, which are reversed items; and the α for the PE Scale did not include items 1, 2, 5, 7, 9, 11, 13, 15, 18, 19, and 22, which are fillers. This indicated that the items comprising the OWEI were much more likely to relate to each other than those items which comprised the PE scale.

Next, a bivariate correlation was computed, by computing the mean score for each of the 841 instruments utilized. The computed correlation (0.485; two-tailed) was not found to be significantly correlated. A scatter plot (Figure 4) graphically shows how little correlation there was between the two scales, using the data set of this study. Therefore, a

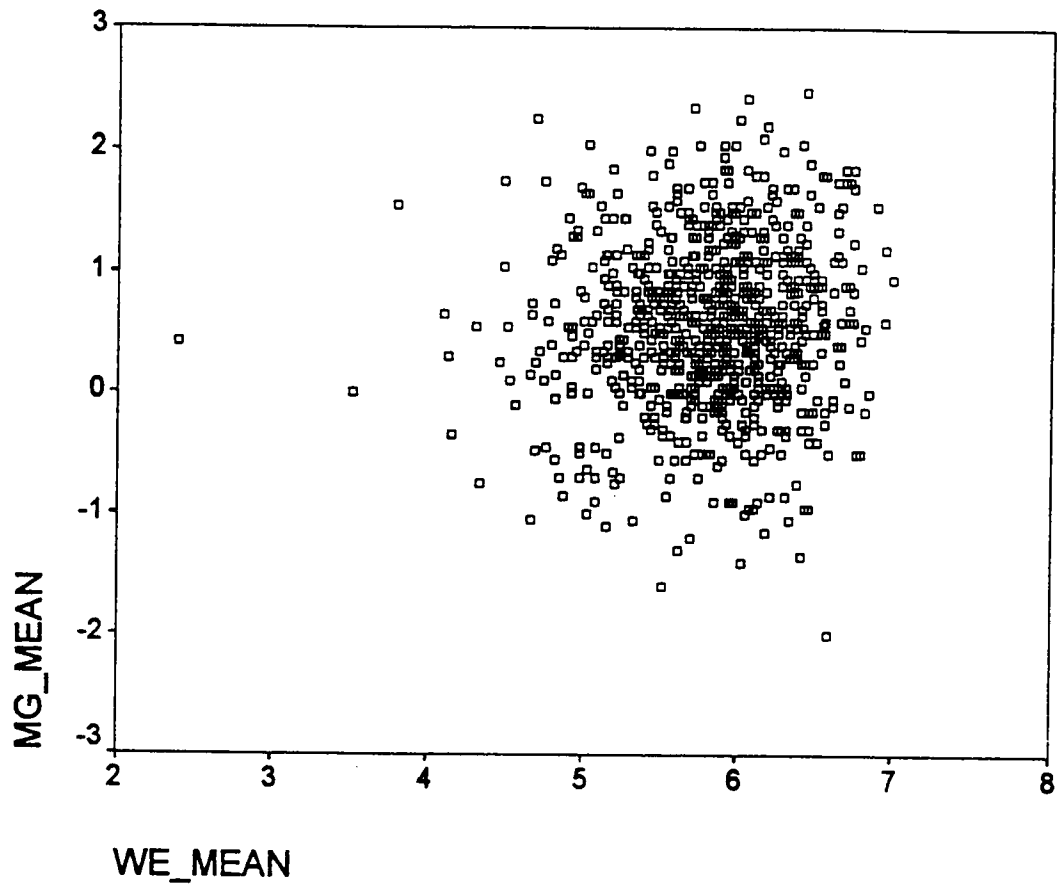


Figure 4. Scatterplot of Mean Scores of PE Vs. OWEI

fundamental assumption of this study, that the two instruments would result in comparable scores, was found to be false. This meant that evidence for convergent validity was not indicated. A factor analysis was then performed for each of the instruments, with both an exploratory and confirmatory mind set. Some authors had indicated a commonly found result of three to five factors; but since the results of bivariate correlation were not significantly correlated, the analysis was basically exploratory in nature. A summary of the results for each of the analyses is shown in Tables 3 and 4. A scree plot for the factor analyses is shown in Figures 5 and 6.

Referring to Table 3, the OWEI was reduced to 8 factors with an Eigen value of one or greater. Referring to Table 4, the PE Scale was reduced to 5 factors with an Eigen value of one or greater. A more readily interpreted form of these analyses in Figures 5 and 6 reveal a very steep slope for the scree plot for the OWEI. The scree plot for the PE Scale does not have as nearly as well-defined "knee" in the slope for the factors. One readily-seen advantage to a well-defined knee is the ability to make a practical decision as to the number of usable factors one may desire to use in post-hoc analyses. The slope and knee together act as aids to discern the unidimensionality of the construct being measured.

One cannot ascertain the validity of either instrument from an exploratory factor analysis; however, it would seem desirable, and even probable, that both scales would reduce to a more readily-interpreted (and manageable) number of dimensions. The factor analyses did provide further evidence that the OWEI and the PE Scale are not

Table 3. Factor Matrix for the OWEI^a, Utilizing Maximum Likelihood Extraction

	Factor							
	1	2	3	4	5	6	7	8
WE37	.999							
WE36	.654							
WE47	.584	.432	-.298			-.383		
WE42	.577	.550						
WE32	.560	.519						
WE31	.504	.385						
WE28	.478	.336						
WE29	.469	.468						
WE15	.377	.341						
WE22	.362	.307						
WE38	.345	.289						
WE6	.285							
WE27								
WE43	.529	.577	-.284					
WE41	.465	.555	.480					
WE40	.423	.550	.366					
WE45	.361	.534						
WE48	.480	.499						
WE33	.286	.478						
WE17	.401	.456						
WE14	.365	.456						
WE3	.327	.456						
WE18	.300	.446						
WE49	.296	.434						
WE20		.430						
WE16	.299	.423						
WE8		.409					.326	
WE11		.397			.310			
WE35		.382						
WE7		.380		.322				
WE50		.364						
WE46		.347						
WE23		.337						
WE19	.309	.332						
WE44		.288						
WE4		.408		.442	-.391			
WE10					.356			
WE1								
WE12					-.305		.338	
WE5								

Extraction Method: Maximum Likelihood.

a. 8 factors extracted. 12 iterations required.

Table 4. Factor Matrix for the PE Scale^a, Utilizing Maximum Likelihood Extraction

	Factor				
	1	2	3	4	5
MG24	.544				
MG25	.534		.372	-.315	
MG27	.517				
MG23	.461				
MG20	.417	.303	-.404		
MG30	.411				
MG29	.360	.357	-.321		
MG8	.344				
MG6	.331				
MG26	.330				
MG12	.308	.301			
MG21	.284				
MG14					
MG4					
MG10	-.355	.648			
MG28	-.351	.614			
MG16			.407		
MG17				.309	
MG3	.286			.308	

Extraction Method: Maximum Likelihood.

a. 5 factors extracted. 7 iterations required.

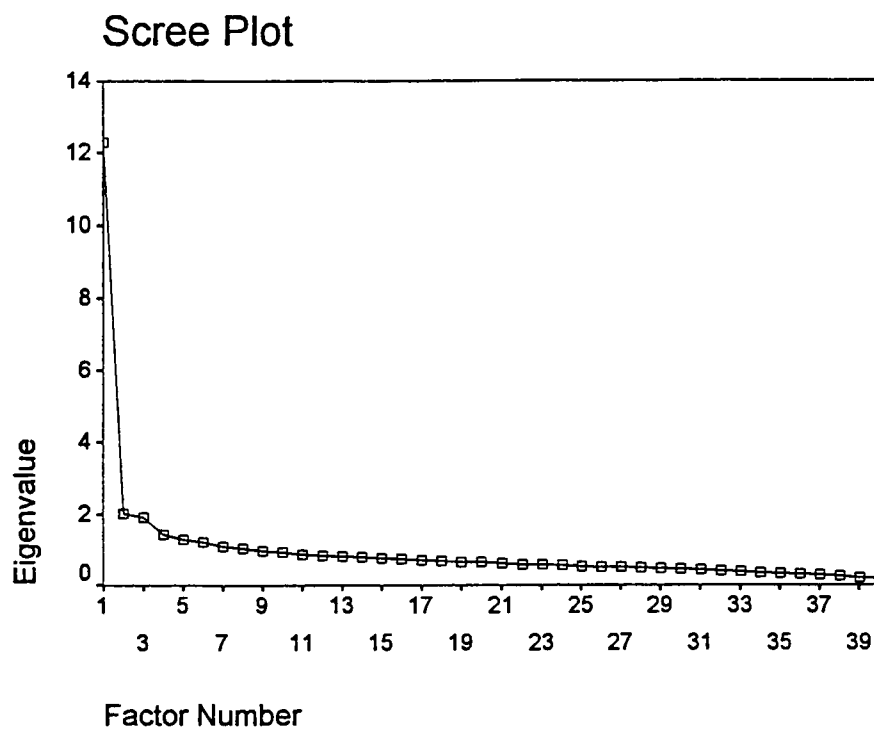


Figure 5. Scree Plot of Factor Analysis for OWEL

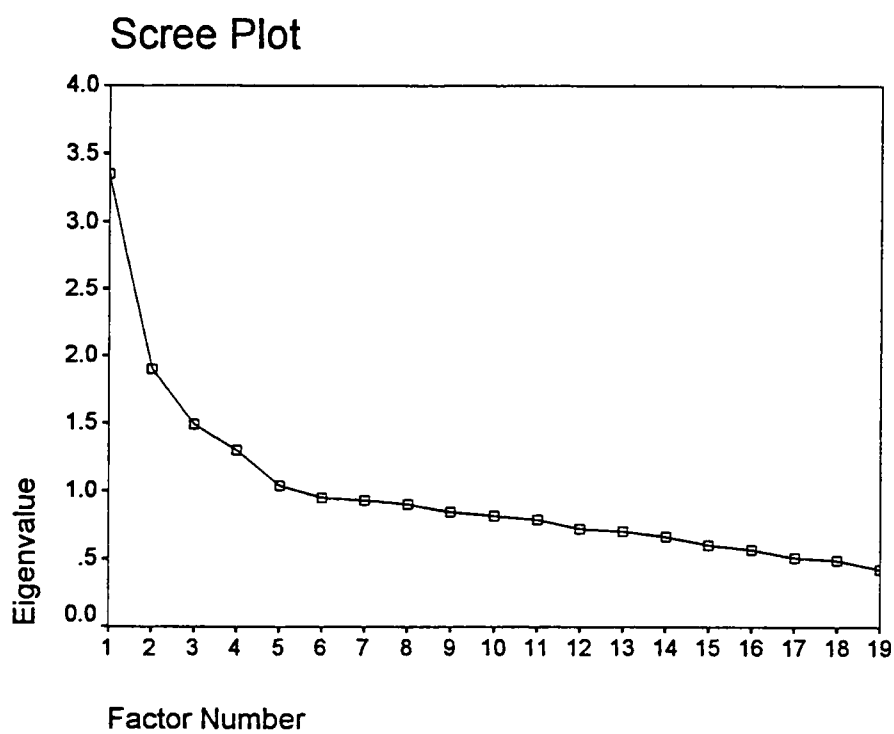


Figure 6. Scree Plot of Factor Analysis for PE Scale

comparable. Either they are measuring completely different dimensions of work ethic, or they are measuring different dimensions of different constructs.

CHAPTER V

POST HOC ANALYSES

As a result of the disparate results of the factor analyses for the two instruments, additional post-hoc investigation seemed appropriate. Because the focus of this study was to investigate the construct validity of the OWEI, these post-hoc analyses all were performed on data related to this instrument. Furthermore, the poor reliability figure for the PE Scale detracted from a desire to investigate its utility. The literature points to the use of several pos-hoc analyses. However, the study focused on the use of AMOS as the analytical tool. It was selected because of recommendations of statistical consultants and appropriateness of this procedure for the data set.

AMOS Analysis of OWEI Iterarations

A high α -value had been computed for this data set for the OWEI instrument, indicating good reliability (or rather, unidimensionality of a measured construct). This finding, in conjunction with the researcher's belief that the instrument's foundation of vernacular phrases (i.e. descriptors) for work ethic, derived from workers themselves, seemed logical and purposeful. Therefore, it was decided that further research was needed to delve into the serviceablity of this measure. What was needed was some way to confirm the dimensions reported in the literature, as well as the dimensions derived from the exploratory factor analysis.

An extremely powerful, albeit sophisticated and difficult-to-implement tool is Structural Equation Modeling (SEM). SEM is a largely confirmatory, rather than exploratory, statistical modeling technique. Other terms used to describe this general

approach to data analysis are structural modeling, analysis of covariance structures, or causal modeling. The beauty of SEM lies in its ability to estimate the strength of relationships among things we cannot measure (i.e., latent constructs, such as intelligence, attitude, etc.) with things we can measure (observed variables). If one has a reason to believe that structure or a model exists among a set of variables, then the model can be tested via SEM. Structural Equation Modeling assumes there is a causal structure among a set of latent variables, and that the observed variables are indicators of the latent variables. Fundamentally speaking, SEM compares a pre-determined linear-regression type model comprised of the unobserved variables to the data set comprised of the observed variables, in order to compute a Goodness-of-Fit Index. Although a thorough discussion of Structural Equation Modeling is not possible here, there exist many sources for further reading (Schumacker & Lomax, 1975; Arbuckle, 1997a; Hoyle, 1995). Many sources exist on the Internet as well (Smallwaters, 1998; Bentler, 1998; McArdle, 1998).

The SEM program AMOS (Arbuckle, 1997b), version 3.6 was used for model-testing. This program is unique among SEM programs, in that it is relatively easy to use, compared to other programs, such as LISREL (Jöreskog & Sörbom, 1995). Because of the large number of observed variables being used, it was decided to use the program in Text Mode. In order to use Structural Equations Modeling with a survey instrument, such as the OWEI, it is necessary to identify which observed variables (work ethic descriptors) correlated with the latent unobserved variables (dimensions of work ethic). For the first test of how the OWEI fit the data, the dimensions of Interpersonal, Initiative, Dependable, and Reversed were used, as found in a factor analysis by Hill and Petty (1995). The

Goodness of Fit Index (GFI) was computed to be 0.780, the Adjusted Goodness of Fit Index 0.760, and the Comparative Fit Index 0.736. All of these indices would be indicative of poor fit.

All SEM programs cumulate in various figures generically called measures of fit. According to the AMOS user's manual, "Model evaluation is one of the most unsettled and difficult issues connected with structural modeling." (Arbuckle, 1997a - Help file in program). Although the GFI was the initial fit measure to be developed, it has been superceded by many other measures. Based on the recommendations of this researchers' statistical consultant and the literature base, it was decided to focus on three indices: the Adjusted Goodness of Fit Index (AGFI), the Comparative Fit Index (CFI), and the Root Mean Square Error of Approximation (RMSEA). The AGFI differs from the GFI, in that it takes into account the degrees of freedom available for testing the model. Its value ranges from 1.0 (a perfect fit) to less than 0.

The Comparative Fit Index (CFI) is a measure grouped into the class which compares your model to a "baseline" model. Many measures of fit utilize a "saturated model" and an "independence model." The basic assumption of the saturated model is that all variables are considered to be related to all other variables. The basic assumption of the independence model is that all variables are considered to be uncorrelated to each other. So a proposed model falls somewhere in between these two extremes. The CFI is a comparison to a baseline model, in that uses the independence model as its baseline for comparison, and adjusts for degrees of freedom and noncentrality of sample distribution. Its value is truncated to fall in the range from 0 to 1.

The Root Mean Square Error of Approximation (RMSEA) measure belongs to the group of measures based on the population discrepancy. In essence, this means that discrepancy function is based on the population moments, instead of the sample moments. Furthermore, the RMSEA measure compensates for model complexity. Models with many parameters are not favored over those which contain few parameters. It is important to note here that the AMOS User's Guide Version 3.6 (Arbuckle, 1997a) suggested this statistic as a good measure to report model fit. A value of .05 or less is considered to be indicative of a close model fit. The actual protocol for testing various models was thus implemented as follows.

Because Structural Equation Modeling is basically a confirmatory technique, one must provide a structure via some previously-applied technique. In order to "deduce" structure, an exploratory factor analysis was performed, utilizing rotation. Using SPSS for Windows, Version 8.0 (SPSS, 1997), Maximum Likelihood extraction was used, with Varimax rotation. The output was sorted by size and absolute values less than .28 were suppressed (See Table 5 as an example of one model fit attempt). Because efforts at fitting a model are essentially a "trial-and-error" process, it is difficult to describe, other than to report that variables were grouped into possible dimensions, based on exploratory factor analysis. The items included for each dimension were chosen, based on factor loadings, and independence from other factors.

Table 5 may provide some illumination into the process. Note that the coefficients are ordered from high to low. In this example, notice that OWEI item 32, "cooperative", has the highest factor loading. But it has high loading figures for both

Table 5. Rotated Factor Matrix for Selected Items of the OWEI,
With Factor Loadings of .28 or Less Suppressed^a

	Factor							
	1	2	3	4	5	6	7	8
WE32	.584				.571			
WE31	.519				.380			
WE22	.488							
WE15	.452	.291						
WE18	.449	.283						
WE14	.441	.400						
WE16	.440							
WE19	.435							
WE28	.419				.392			
WE17	.405		.281					
WE50	.404							
WE35	.316	.315						
WE10		.561						
WE6		.534						
WE49		.526						
WE7	.281	.523						
WE11	.335	.501						
WE45	.317	.491						
WE38		.444						
WE5		.346						
WE27								
WE8			.594					
WE12			.584					
WE26	.312		.524					
WE23			.517					
WE1			.417					
WE33		.296	.371					
WE44								
WE41				.811				
WE40		.303		.645				
WE48				.548	.329			
WE47	.298				.752			
WE46					.399			
WE29	.373		.281		.394			
WE37	.311							
WE36		.384				.850		
WE4			.288			.436		
WE3	.305						.735	
WE43	.409				.301		.561	
WE42	.457			.291	.296			.628
								.553

Extraction Method: Maximum Likelihood.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 9 iterations.

factors 1 and 5. One iteration of an AMOS analysis might include item 32 in a model; including it in either dimensions 1; 5; 1 and 5; or it might not include it the model at all, since it shares variance. Each iteration of the AMOS analysis required that an AMOS input file be created. An example is provided in Appendix C.

Many trials later, a model was found which fit the data well (See Appendix D). This model is comprised of four dimensions. Dimension 1, Interpersonal, is comprised of OWEI items 22, 16, 19, and 50. Dimension 2, Initiative, is comprised of OWEI items 10, 49, 6, 38, and 5. Dimension 3, Dependable, is comprised of OWEI items 8, 12, 23, and 1. And dimension 4, Devoted, is comprised of OWEI items 41 and 48. The names for each dimension are based on subjective judgement, and are deduced by observing the phrases (in this case) which “make up” each grouping. These researcher-named dimensions were merely used here for labeling purposes, and for ease of explanation. The important issue is the results of the AMOS analysis for this iteration.

Note the values for AGFI, CFI, and RMSEA on page 151 of Appendix D. The value for the Adjusted Goodness of Fit Index (AGFI) was computed to be 0.947. A value of 0.9 or higher is considered to be a good model fit. The value for the Comparative Fit Index (CFI) was computed to be 0.935. A value of 0.9 or higher is considered to indicate a good model fit. And finally, the value for the Root Mean Square Error of Approximation (RMSEA) was computed to be 0.047. A value of 0.05 or less is considered to be indicative of a good model fit.

The 0.047 value for RMSEA is especially important, in that Arbuckle (1997a) recommends it in reporting SEM analysis. Browne and Cudeck (1993) consider it to be a

better indicator of model fit: "Practical experience has made us feel that a value of the RMSEA of about .05 or less would indicate a close fit of the model in relation to the degrees of freedom. This figure is based on subjective judgment. It cannot be regarded as infallible or correct, but it is more reasonable than the requirement of exact fit with the RMSEA = 0.0. We are also of the opinion that a value of about 0.08 or less for the RMSEA would indicate a reasonable error of approximation and would not want to employ a model with a RMSEA greater than 0.1" (p. 142).

It should be noted that the data set was divided in half, and an AMOS analysis revealed very similar values for the three measures of fit quoted. It should also be noted that the various permutations allowable in a SEM analysis almost always allow for further improvement in a model.

Summary of Results

In brief, the results were as follows. The Cronbach alpha for the Mirels & Garrett (1971) Protestant Ethic (PE) Scale was computed to be 0.67, the alpha for Petty's (1991a) Occupational Work Ethic Inventory was computed to be 0.93. A Pearson bivariate correlation procedure did not reveal a significant correlation between the two scales investigated. Since the focus of this study was on the OWEI, post-hoc analyses using casual modeling equations methodology resulted in an adapted OWEI scale consisting of 15 items. Three goodness-of-fit indices were reported; these were: Adjusted Goodness of Fit Index (AGFI), 0.947; Comparative Fit Index (CFI), 0.935; and Root Mean Square of Approximation (RMSEA), 0.047. All three indices indicate a good model fit for this data set.

CHAPTER VI

SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this chapter is to summarize the research that was undertaken. A summary of the problem investigated, with the affiliated research methodology implemented is presented. Additional discussions are provided which focus on the findings, conclusions, and recommendations for further research.

Summary

This study developed from a desire to “validate” the OWEL, an instrument that purports to survey the level of “work ethic” that individuals may ascribe to. While it should be apparent, it should be stated here that “level” as used here is not meant to connote goodness or badness - just variation. Furthermore, any latent construct, such as the attribute “work ethic”, is impossible to directly access. However, observation and empirical comparisons related to actual work output may provide insight together with an instrument of this nature.

The main vehicle for meeting the above goal was to compare the scores of a commonly-used work ethic instrument, The Protestant Ethic Scale (Mirels and Garrett, 1971), with those of a more recently developed instrument, The Occupational Work Ethic Inventory (Petty, 1991a). The choice of the comparison instrument was also based on similarities in construct definition and focus. Primary statistics used included bivariate correlations and factor analyses. Post hoc analyses included factor analysis and structural equation modeling.

The sample chosen for this research was comprised of adult workers, employed in

a variety of positions. The data for the study were gathered from a work ethic survey packet, consisting of the OWEI and PE scales, as well as a brief demographic questionnaire. Participants from the southeastern United States were either asked to complete the packet in person, or were mailed the packet and asked to complete it. A study information sheet was provided. The sample consisted of 841 usable subjects. As a sampling protocol was not used; the data set was one of convenience.

Major Findings

A bivariate correlation using the means scores of the PE and OWEI scales was found to be not significant for this sample. As this was a fundamental test for equivalency, it was determined that the two scales were either not measuring the same thing, or were so different in orientation that this procedure could not detect it. This also prohibited employment of many of the more stringent construct validity tests and procedures.

Scree plots, via factor analyses for both the PE and OWEI, did reveal a factor structure that appeared to much more homogenous for the OWEI than that of the PE scale. Because of this, the researcher decided to perform post-hoc analyses on the OWEI in order to investigate the possibility of the OWEI's construct validity. Through the use of factor analysis and structural equation modeling, a model was found which fit the data in a statistically significant way. The model determined was comprised of four factors, and included fifteen items from the original OWEI instrument. The dimension or factor names were derived in an inductive manner from the items which comprised each dimension. Factor one, Interpersonal, was comprised of items: 22 (patient); 16 (careful);

19 (emotionally stable); and 50 (modest). Factor two, Initiative, was comprised of items: 10 (initiating); 49 (resourceful); 6 (ambitious); 38 (persistent); and 5 (independent). Factor three, Dependable, was comprised of items 8 (reliable); 12 (honest); 23 (punctual); and 1 (dependable). And finally, factor four, Devoted, was comprised of items: 41 (devoted); and 48 (loyal). It is noteworthy here that these labels seem appropriate, as they describe work ethic as delineated by Petty (1991a), and Hill & Petty (1995). Furthermore, this model was found to be a very good fit, via an unbiased statistical procedure, rather than through the more normal mode of human inductive logic.

Conclusions

As stated in the introductory chapter, a major problem has been prevalence of research focused on obtaining substantive results, while construct validity issues are neglected. In particular, the Occupational Work Ethic Inventory (Petty, 1991a) has suffered from a lack of validity research. This research effort has concentrated on ascertaining the construct validity of this instrument for assessing work ethic attitudes.

Two very important issues became apparent as a result of this research. One, the Protestant Ethic Scale (Mirels & Garrett, 1971), a commonly used instrument, did not demonstrate a high α level - indicating poor internal consistency, which is fundamental to the structure of good instrument validity. Secondly, the OWEI did not correlate to any distinguishable degree with the PE scale. This should obviously raise concerns as to what content the OWEI scale is measuring.

The rationale for this study was based on investigating the validity of OWEI. It was discovered that the instrument, as currently configured, did not fit the data set of this

study, using the previously named dimensions of Interpersonal skills, Initiative, Being dependable, and the Reversed items on the instrument. As stated in the Rationale section of the introductory chapter, a practical consideration is the improvement of this scale (and any other, for that matter). An improved scale was developed through this research, with the additional benefit of it being significantly shortened. It also entails multiple dimensions, which are deemed to be so important to the overall description of work ethic, as delineated by Morrow (1983), Furnham (1990a), and others.

Within the limitations of this study, the following conclusions have been drawn:

1. The questionnaire scales for work ethic compared herein are not comparable to the extent that the OWEI may be considered to be measuring the same construct.
2. A subset of items which comprise the OWEI were found which describe the data set in a highly significant way. This "subscale" or variation of the OWEI was comprised of four dimensions, which provides evidence for the argument that the construct of work ethic is multi-dimensional/faceted, as has been suggested in the literature. It may be concluded that the OWEI in the newly revised form is a reliable instrument; and from an inductive-reasoning perspective is comprised of descriptors used in the vernacular of the working man to describe "work ethic."

Recommendations

1. The Occupational Work Ethic Inventory should be revised into the form suggested by this study.

2. Studies should be conducted which utilize methodologies that may gauge work ethic empirically; such scores or measures must be compared to those of the OWEI (or any other instrument which purports to assess work ethic attributes in individuals or groups).
3. Replication studies should be performed to ascertain if findings are consistent with the degree of significance indicated for the “revised” OWEI, via structural equation modeling.
4. Further validation studies should be conducted on similar instruments.
5. Various recommendations for further research may be made regarding the utility of any instrument with the caveat of considering the effects of culture, gender, and other demographics.

Implications

From even a perusal of the literature, it may be readily deduced that work ethic is a crucial attribute for a job. And since the aspects of knowledge and skills are emphasized in training efforts, to the almost total neglect of attitudes, this is important.

The ambiguous, or otherwise untenable notion of “work ethic” as a construct, has suffered due to the absence of a logical model. Through this study, utilizing structural equation modeling, a model is presented which is, at the least, statistically verifiable. This is a crucial component to the furtherance of the theoretical base. Too many philosophically-varied approaches have been undertaken; what is needed is focus.

Even with the advances made (due to technology) in improved data gathering methods and enhanced psychometric techniques, there exist many areas in human

resource development which may be considered to be in their “infancy” stages. Rigorous research is a must if the field is to advance.

REFERENCES

REFERENCES

- Aiken, L.R. (1994). Psychological testing and measurement (8th ed.). Boston: Allyn and Bacon.
- Ajzen, I., & Fishbein, M.(1972). Attitudes and normative beliefs as factors influencing behavioral intentions. Journal of Personality and Social Psychology, 21(1), 1-9.
- Aldag, R. J. & Brief, A. P. (1975). Some correlates of work values. Journal of Applied Psychology, 60, 757-760.
- Allender, B. R. (1993). The occupational work ethic of vocational students in east tennessee. (Doctoral dissertation, The University of Tennessee, Knoxville, 1993). Dissertations Abstracts International, 54(06), 2127.
- Almquist, E., & Angrist, S. (1971). Role model influences on college women's career aspirations. Merrill-Palmer Quarterly, 17, 263-279.
- Althauser, R., & Herberlein, T. (1970). Validity and the multitrait-multimethod matrix. In E.F. Borgotta & F.W. Bornstedt (eds) Social methodology 1970. San Francisco: Jossey-Bass, 151-169.
- Alwin, D. (1974). An analytic comparison of four approaches to the interpretation of relationships in the multitrait-multimethod matrix. In H. Costner (ed.) Sociological Methodology 1973-74. San Francisco: Jossey-Bass.
- Anderson School District Five, S.C. (1994). Job shadowing...building the foundation for school-to-work transition. Guide for school coordinators and teachers.

(ERIC Document Reproduction Service No. ED 384 773).

Andrews, S., & Martin, D. (1995). Values education in the elementary school: A practical application of research. Paper presented to the "moral education" SIG at the Annual Meeting of the Association for Educational Research Association, San Francisco, CA.

Anthony, P. D. (1977). The ideology of work. Great Britain: Tavistock.

Arbuckle, J.L. (1997a). AMOS user's guide version 3.6. Chicago: SPSS Inc.

Arbuckle, J.L. (1997b). AMOS (Version 3.6) [Computer Software]. Chicago, IL: Smallwaters Corporation.

Argyris, C., & Schon, D.A. (1974). Theory in practice: Increasing professional effectiveness. San Francisco: Jossey-Bass.

Babu, P. P., & Reddy, K. S. (1989). Work ethic religiosity and job involvement of employees under different managements [CD-ROM]. Indian Journal of Applied Psychology, 26, 30-37. Abstract from: SilverPlatter File: PsycLIT Item: 78-17013

Bagozzi, R.P. (1980). Causal models in marketing. New York: Wiley.

Beehr, T., Walsh, J., & Taber, T. (1976). Relationship of stress to individually and organizaionally valued states: Higher order needs as a moderator. Journal of Applied Psychology, 61, 41-47.

Bendix, R. (1974). Work and authority in industry. Berkeley: University of California Press.

Bentler, P. (1998). Original research and theoretical treatises [online]. Available: <http://www.math.ucla.edu/~bentler/or1995.html>

- Berniker, E. (1993). Productivity and its rewards: Toward a new work ethic. Employee Responsibilities and Rights Journal, 6, 161-170.
- Bernstein, P. (1988). The work ethic: Economics, not religion. Business Horizons, 31(3), 8-11.
- Bjorkquist, D. (1991). Good work. Journal of Vocational Education Research, 16,(2), 33-51.
- Blalock, H.M., Jr. (1968). The measurement problem: A gap between the languages of theory and research. In H.M. Blalock, Jr. and A.B. Blalock (Eds.), Methodology in social research. New York: McGraw-Hill.
- Blood, M., (1969). Work values and job satisfaction. Journal of Applied Psychology, 53, 456-459.
- Bolman, L.G., & Deal, T.E. (1991). Leadership and management effectiveness: A multi-frame, multi-sector analysis. Human Resource Management, 30, 509-534.
- Borg, W.R., & Gall, M.D. (1983). Educational research: An introduction. New York: Longman, Inc.
- Brauchle, P.E., Petty, G.C., & Morgan, K.R. (1983). The factorial validity of the affective work competency inventory. Educational and Psychological Measurement, 43(2), 603-609.
- Braude, L. (1975). Work and workers. New York: Praeger.
- Brown, M., & Cudeck, R. (1993). Alternative ways of assessing model fit. In Bollen, K.A., & Long, J.S. (Eds.) Testing structural equations models. Newbury Park, California: Sage, 136-162.

- Buchanan, B. (1974). Administrative Science Quarterly, 19, 533-546.
- Buchholz, R. (1978). An empirical study of contemporary beliefs about work in American society. Journal of Applied Psychology, 63, 219-227.
- Byrne, E. (1990). Work inc.: A philosophical inquiry. Philadelphia : Temple University Press.
- Campbell, D.T. (1960). Recommendations for APA test standards regarding construct, trait, or discriminant validity. American psychologist, 15, 546-553.
- Campbell, D.T., & Fiske, D.W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. Psychological Bulletin, 56, 81-105.
- Campbell, J.P. (1976). Psychometric theory. In M.D. Dunnette (Ed.) Handbook of industrial and organizational psychology. Chicago: Rand McNally, 185-222.
- Cappelli, P. & Iannozzi, M. (1995). Rethinking the skills gap: Is it craft or character? EQW issues number 9 Report by the National Center on the Educational Quality of the Workforce, Philadelphia, PA. (ERIC Document Reproduction Service No. ED 389 950).
- Carmines, E. G. & Zeller, R. A. (1979). Reliability and validity. Sage University Paper series on Quantitative Applications in the Social Sciences. Beverly Hills and London: Sage Publications.
- Cherrington, D. J. (1980), The work ethic: Working values and values that work. New York: AMACOM.
- Cherrington, D., Condie, S., & England, J. (1979). Age and work values. Academy of Management Journal, 22, 617-623.

Cohen, A. (1995). An examination of the relationships between work commitment and nonwork domains. Human Relations, 48, 239-263.

Cronbach, L.J. (1950). Further evidence on response sets and test design. Educational and psychological measurement, 10, 3-31.

Cronbach, L.J. & Meehl, P.E. (1955). Construct validity in psychological tests. Psychological Bulletin, 52, 281-302.

Daft, R. L., & Steers, R. M. (1986). Organizations: A micro/macro approach. Glenview, IL: Scott, Foresman, and Co.

Donsky, A., & Others (1994). Occupational needs assessment survey. Report by Seminole Community College and the Seminole County Public Schools. (ERIC Document Reproduction Service No. ED 371 800).

Dubin, R. (1956). Industrial workers' worlds: A study of the "central life interests" of industrial workers, Social Problems, 3, 131-142.

Dunham, R.B., Aldag, R.J., Brief, A.P. (1977). Dimensionality of task design as measured by the Job Diagnostic Survey. Academy of management journal, 20, 209-223.

Dunn, A. (1979). The case of the suspect salesman. Harvard Business Review, 57, 38.

Eden D., & Jacobson, D. (1976). Journal of Vocational Behavior, 8, 145-154.

Etzioni, A. (1961). A comparative analysis of complex organizations. New York: Free Press.

Evered, R. & Louis, M. R. (1981). Alternative perspectives in the organizational sciences: "Inquiry from the inside" and "Inquiry from the outside." Academy of

Management Review, 6, 385-395.

Farrell, G. M., & Mudrack, P. E. (1992). Academic involvement and the nontraditional student. Psychological Reports, 71, 707-713.

Faunce, W. (1959). Occupational Involvement and the selective testing self-esteem. Paper presented at the Meeting of the American Sociological Association: Chicago.

Feather, N. T. (1992). Values, valences, expectations, and actions. Journal of Social Issues, 48, 109-124.

Fishbein, M., & Ajzen, I. (1975). Belief, attitude, intention and behavior: An introduction to theory and research. Reading, MA: Addison-Wesley.

Florida State Department of Education (1991). Florida employer opinion survey: Annual Report. Third annual report of the Florida Education and Training Placement Information Program (FETPIP). (ERIC Document Reproduction Service No. ED 339 862).

Ford, F. A., & Herren, R. V. (1993). The teaching of work ethics: Current practices of work program coordinators in Georgia. Paper presented at the American Vocational Association Convention, Nashville, TN.

Ford, F. A., & Herren, R. V. (1995). The teaching of work ethics: Current practices of work program coordinators in Georgia. Journal of Vocational Education Research, 20,(1), 79-95.

Frary, R.B. (1997). A Brief Guide to Questionnaire Development [On-line]. Available: <http://eircae2.educ.cua.edu/ft/tamu/vpiques3.htm>

Furnham, A. (1989). The protestant work ethic: The psychology of work beliefs and values. London: Routledge.

Furnham, A. (1990a). A content, correlational, and factor analytic study of seven questionnaire measures of the protestant work ethic. Human Relations, 4, 383-399.

Furnham, A. F. (1990b). The protestant work ethic and Type A behavior. Psychological Reports, 66, 323-328.

Furnham, A., Bond, M., Heaven, P., & Hilton, D. (1993). A comparison of protestant work ethic beliefs in thirteen nations. Journal of Social Psychology, 133, 185-197.

Furnham, A., & Henderson, M. (1983). Assessing assertiveness: A content and correlation analysis of five assertiveness inventories. Behavioral Assessment, 6, 79-88.

Furnham, A., Kirkcaldy, B. D., & Lynn, R. (1994). National attitudes to competitiveness, money, and work among young people: First, second, and third world differences. Human Relations, 47, 119-132.

Furnham, A. & Koritsas, E. (1990). The protestant work ethic and vocational preference. Journal of Organizational Behavior, 11, 43-53.

Gannon, M., & Hendrickson, D. (1973). Career orientation and job satisfaction among working wives. Journal of Applied Psychology, 57, 339-340.

Gansta, O. (1981). Protestant ethic and performance: A re-examination. Psychological Reports, 48, 335-338.

Gardner, P.L. (1975). Scales and statistics. Review of Educational Research, 45, 43-47.

Giorgi, L., & Marsh, C. (1990). The protestant work ethic as a cultural phenomenon [CD-ROM]. European Journal of Social Psychology, 20, 499-517. Abstract from: Silver Platter File: PsycLIT Item: 78-15098

Gould, S. (1979). An equity-exchange model of organizational involvement. Academy of Management Review, 4, 53-62.

Gordon, M., Philpot, J., Burt, R., Thompson, C., & Spiller, W. (1980). Commitment to the union: Development of a measure and an examination of its correlates. Journal of Applied Psychology, 65, 479-499.

Green, C. (1967). Job involvement scale. Unpublished Manuscript, Ohio State University.

Greenhaus, J. H. (1971). An investigation of the role of career salience in vocational behavior. Journal of Vocational Behavior, 1, 209-216.

Greenhaus, J. H. & Simon, W. E. (1977). Career Salience, work values, and vocational indecision. Journal of Vocational Behavior, 10, 104-110.

Gregson, J. (1994). Posing problems to raise student consciousness about values, attitudes, and worker responsibilities: A democratic possibility. Journal of Vocational Education Research, 19,(4), 13-35.

Gregson, J. A., & Bettis, P. J. (1991). Secondary trade and industrial education work values instruction: Emancipatory or Indoctrinational. Paper presented at American Vocational Association Convention, Los Angeles, CA.

Gregson, J. F. (1990). Work values and attitudes instruction as viewed by secondary trade and industrial education teachers (Doctoral dissertation, Virginia

Polytechnic University, 1990). Dissertation Abstracts International, 51, (06).

Guastello, S. J., Rieke, M. L., Guastello, D. D., & Billings, S. W. (1992). A study of cynicism, personality, and work values. Journal of Psychology, 126, 37-48.

Guttman, L. (1954). An outline of some new methodology in social research. Public opinion quarterly, 18, 395-404.

Hagstrom, T, & Gamberale, F. (1995). Young people's work motivation and value orientation. Journal of Adolescence, 18(4), 475-490.

Hall, D., Schneider, B., & Nygfren, H. (1970). Personal factors in organizational identification. Administrative Science Quarterly, 15, 176-190.

Hall, G. (1990). Work attitudes of traditional and non-traditional technical community college students. Unpublished master's thesis, The University of Tennessee, Knoxville, 1990.

Hall, G. (1991). Do older college students have different attitudes about work as compared with younger traditional students? Tennessee Education, 21(2), 27-29.

Hammond, P., & Williams, R. (1976). The protestant ethic thesis: A social psychological assessment. Social forces, 54, 579-589.

Haney, P. H. (1980). Changing values: Where are we going. In Peggy H. Haney (Ed.), Forum, a biannual publication of J.C. Penney Company (pp. 8-9).

Hatcher, T. G. (1994). The work ethic of apprentices and instructors in a trade union apprenticeship training program. (Doctoral dissertation, The University of Tennessee, Knoxville, 1993). Dissertation Abstracts International, 55(03) 489A.

Haynes, T. (1992). Defining the work force of the 1990s: Implications for

curriculum development and instructional practice. In A.M. Burford & V. Arnold (Eds.), The hidden curriculum (National Business Education Yearbook, No. 30, pp. 7-20).

Reston, VA: National Business Education Association.

Hearing on H.R. 6, Elementary and Secondary Education Act Reauthorization:
Hearings before the Subcommittee on Elementary, Secondary, and Vocational Education,
of the Committee on Education and Labor, 103rd Cong., 1st Sess. 1 (1993).

Heaven, P. C. (1990). Suggestions for reducing unemployment: A study of protestant work ethic and economic locus of control beliefs [CD-ROM]. British Journal of Social Psychology, 29, 55-65. Abstract from: SilverPlatter File: PsycLIT Item: 77-22561

Herman, J.B., & Hulin, C.L. (1973). Managerial satisfactions and organizational roles: An investigation of Porter's need deficiency scales. Journal of Applied psychology, 57, 118-124.

Herzberg, F., Mausner, B., & Snyderman, B. B. (1959). The motivation to work. New York: John Wiley & Sons.

Hill, R. B. (1993). The work ethic as determined by occupation, education, age, gender, work experience, and empowerment. (Doctoral dissertation, The University of Tennessee, Knoxville, 1992). Dissertations Abstracts International, 53(07), 2343A.

Hill, R. B. & Petty, G. C. (1995). A new look at employability skills: A factor analysis of the occupational work ethic. Journal of Vocational Education Research, 20(4), 59-71.

Ho, R. (1984). Development of an Australian work ethic scale. Australian

Psychologist, 19, 321-332.

Hollingsworth, C. (1995). Leadership characteristics and work ethic of tennessee agricultural extension service home economists. Unpublished doctoral dissertation, The University of Tennessee, Knoxville.

Holy Bible: New International Version (NIV). (1973). Grand Rapids, Mich.: Zondervan.

Hoyle, R.H. (Ed.). (1995). Structural equation modeling: Concepts, issues and applications. Thousand Oaks, CA: Sage Publications.

Hrebiniak, L., & Alutto, J. (1972). Personal and role-related factors in the development of organizational commitments. Administrative Science Quarterly, 18, 555-573.

Jackson, D.N. (1969). Multimethod factor analysis in the evaluation of convergent and discriminant validity. Psychological bulletin, 72, 30-49.

Jackson, D.N., & Messick, S. (1958). Content and style in personality assessment. Psychological bulletin, 55, 243-252.

Jacoby, S.M. (1988). Employee attitude surveys in historical perspective. Industrial Relations, 27, 74-93.

Jaeger, B. (1995). The meaning of work among the self-employed [CD-ROM]. Abstract from: Proquest File: Dissertation Abstracts Item: 9511027

Jaggi, B. (1988). A comparative analysis of worker participation in the United States and Europe. In Dlugos, G., Dorow, W., Weiermair, K., and Danesy, F. C. (Eds.), Management under differing labour market and employment systems (pp. 443-454).

Berlin: Walter de Gruyter.

Jöreskog, K.G. & Sörbom, D. (1995). LISREL 8 user's reference guide. Chicago: Scientific Software International.

Kaplan, H., & Tausky, C. (1977). Humanism in organizations: A critical appraisal. Public Administration Review, 37, 171-180.

Kazanas, H.C. (1978). Affective work competencies for vocational education. Columbia, MO: University of Missouri. (ERIC Document Reproduction Service No. EJ 075 733).

Kerlinger, F.N. (1973). Foundations of behavioral research. New York: Holt, Rhinehart, & Winston.

Kirkcaldy, B., & Cooper, C. L. (1992). Work attitudes and leisure preferences: Sex differences. Personality and Individual Differences, 13, 329-334.

Kirkcaldy, B. D., & Furnham, A. (1993). Predictors of beliefs about money. Psychological Reports, 73, 1079-1082.

Koch, J., & Steers, R. (1978). Job attachment, satisfaction, and turnover among public sector employees. Journal of Vocational Behavior, 12, 119-128.

Labovitz, S. (1970). The assignment of numbers to rank order categories. American Sociological Review, 35, 515-524.

Lankard, B. A. (1995). Career development in generation X: Myths and Realities. Report by ERIC Clearinghouse on Adult, Career, and Vocational Education, Columbus, Ohio. (ERIC Document Reproduction Service No. ED 388 801).

Lawler, E. (1978). The new plant revolution. Organizational Dynamics Winter

1978.

Lawler, E., & Hall D. (1970). Relationships of job characteristics to job involvement, satisfaction, and intrinsic motivation. Journal of Applied Psychology, 54, 305-312.

Lawshe, C. H. (1975). A quantitative approach to content validity. Personnel Psychology, 28, 563-575.

Lipset, S. M. (1990). The work ethic - then and now. Public Interest, Winter 1990, 61-69.

Lodahl, T. M. & Kejner, M. (1965). The definition and measurement of job involvement. Journal of Applied Psychology, 49, 24-33.

Lyson, T. (1984). Sex differences in the choice of a male or female career line: An analysis of background characteristics and work values. Work and occupations, 11(2), 131-146.

Ludeman, K. (1989). The Worth ethic: How to profit from the changing values of the new work force. New York: Dutton.

Maccoby, M. (1988). Why work. New York: Simon and Schuster.

Maccoby, M., & Terzi, K. A. (1981). What happened to the work ethic? In National Conference on Business Ethics, The work ethic in business: Proceedings of the Third National Conference on Business Ethics (W. M. Hoffman & T. J. Wyly, Eds., pp. 19-58). Cambridge, MA: Oelgeschlager, Gunn & Hain.

Maurer, A., Oszustowicz, B., & Stocki, R. (1994). Gender and attitudes towards work. International Journal for the Advancement of Counseling, 17(1), 35-46.

McArdle, J. (1998). John J. McArdle, Professor of psychology, UVa [online].
Available: http://kiptron.psyc.virginia.edu/jack_mcardle/

McCracken, J. & Falcon-Emanuelli, A. (1994). A theoretical basis for work values research in vocational education. Journal of Vocational and Technical Education, 10,(2), 4-14.

McNemar, Q. (1969). Psychological statistics. (4th Ed.) New York: Wiley.

Merrens, H. & Garrett, J. (1975). The Protestant ethic scale as a predictor of repetitive work performance. Journal of Applied Psychology, 60, 125-127.

Miller, D. (1980). Differences in the Protestant work ethic values of selected freshmen and senior students at a land grant university. Doctor of Philosophy dissertation, Oregon State University, 1980.

Miller, P. F., & Brown, W. K. (1990). Vocational ethics: A supplementary instructional packet [Instructional Packet]. Springfield, IL: Illinois State Board of Education, Dept. of Adult, Vocational and Technical Education.

Miller, G. (1967). Professionals in Bureaucracy: Alienation among industrial scientists and engineers. American Sociological Review, 32, 755-768.

Miller, W. F. (1986). Emerging technologies and their implications for America. USA Today, 115, November 1986, 60-65.

Mirels, H. L. & Garrett, J. B., (1971). The protestant work ethic as a personality variable. Journal of Consulting and Clinical Psychology, 36, 40-44.

Morrow, P. C. (1983). Concept redundancy in organizational research: The case of work commitment. Academy of Management Review, 8, 486-500.

Morrow, P. C., Eastman, K., & McElroy, J. C. (1991). Concept redundancy and rater Naivety in Organizational Research. Journal of Applied Social Psychology, 3, 219-232.

Morrow, P. C. & McElroy, J. C. (1986). On assessing measures of work commitment. Journal of Occupational Behavior, 7, 139-145.

Mowday, R. T., Porter, L. W., & Steers, R. M. (1979). The measurement of organizational commitment. Journal of Vocational Behavior, 14, 224-247.

Mudrack, P. E. (1993). The protestant work ethic and Type A behavior: Overlap or orthogonality? Personality and Individual Differences, 14, 261-263.

Nagle, B. F. (1953). Criterion development. Personnel Psychology, 6, 271-289.

National Council on Vocational Education (1991). Rediscovering our national vision: Building positive self-esteem and a strong work ethic. Opinion paper by the National Council on Vocational Education (NCVE), District of Columbia, U.S.A. (ERIC Document Reproduction Service No. ED 339 862).

National PTA (1992). National PTA/World Book successful learning survey. Report by National PTA, Chicago, IL. (ERIC Document Reproduction Service No. ED 372 143).

Nelson, K. (1992). The work ethic game. Moral Education Forum, 17,(3), 1-19.

Nie, N.H. (1975). Statistical package for the social sciences (2nd ed.). New York: McGraw-Hill.

Niedergang, M., & McCoy, M. (Ed.) (1992). Revitalizing America's economy for the 21st century. Non-classroom guide by the Topsfield Foundation, Pomfret, CT. (ERIC

Document Reproduction Service No. ED 364 479).

Northrop F. S. C. (1959). The logic of modern physics. New York: Macmillan.

Nunnally, J. (1978). Psychometric theory. New York: McGraw-Hill.

Oklahoma State Department of Vocational and Technical Education (1992).

Individualized cooperative education (second year): Teacher edition. (ERIC Document Reproduction Service No. ED 384 708).

Office of Federal Statistical Policy and Standards. (1980). Standard occupational classification manual (2nd ed.). Washington, D.C.: U.S. Department of Commerce.

Oppenheim, A.N. (1992). Questionnaire design, interviewing, and attitude measurement (Rev. ed.). London: Pinter. (Original work published 1966)

Osigweh, C. A. B. (1989). Concept fallibility in organizational science. Academy of management review, 14, 579-594.

Parker, S. (1983). Leisure and work. London: George Allen & Unwin.

Patchen, M. (1970). Participation, achievement, and involvement on the job. Englewood Cliffs, N.J.: Prentice-Hall.

Petty, G.C. (1979). Affective work competencies of workers, supervisors, and vocational educators. (Doctoral dissertation, University of Missouri-Columbia, 1978). Dissertations Abstracts International, 39, 5992A.

Petty, G. C. (1990). [Work ethic survey instrument]. Unpublished survey.

Petty, G. C. (1991a). Development of the Occupational Work Ethic Inventory. Unpublished manuscript, The University of Tennessee, Knoxville.

Petty, G.C. (1991b, October). Technology education and the work ethic:

Teaching the forgotten competencies. Paper presented to the Southeastern Technology Education Conference, Blacksburg, VA.

Petty, G.C. (1995a). Adults in the work force and the occupational work ethic. Journal of Studies in Technical Careers, 25(3), 133-140.

Petty, G.C. (1995b). [Work ethic survey instrument] Unpublished survey.

Petty, G.C. (1995c). Education and the occupational work ethic. SAEOPP Journal, 14,(2), 1-13.

Petty, G.C. (1995d). Vocational-technical education and the occupational work ethic. Journal of Industrial Teacher Education, 32(3), 45-58.

Petty, G. & Hill, R. (1994). Are women and men different? A study of the occupational work ethic. Journal of Vocational Education Research, 19(1), 71-89.

Petty, G.C. & Morgan, K.R. (1980). Teaching strategies to facilitate students acquisition of affective work competencies (Project No. 80-131-600-7). Columbia, MO: University of Missouri-Columbia, Department of Education.

Quadagno, J. (1978). Career continuity and retirement plans of men and women physicians. Sociology of Work and Occupations, 5, 55-74.

Ray, J. (1982). The protestant ethic in Australia. Journal of Social Psychology, 116, 127-138.

Reitz, H., & Jewell, L. (1979). Sex, locus of control, and job involvement: A six-country investigation. Academy of Management Journal, 22, 72-80.

Rodgers, D. T. (1978). The work ethic in industrial America, 1850-1920. Chicago: University of Chicago Press.

Rorabaugh, W. J. (1986). The craft apprentice: From Franklin to the machine age in America. New York: Oxford University Press.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs, 80.

Rowe, R., & Snizek, W. (1995). Gender differences in work values: Perpetuating the myth. Work and Occupations: An International Sociological Journal, 22(2), 215-229.

SAS Institute Inc. (1985). SAS/STAT™ guide for personal computers, version 6 edition. Cary, NC: SAS Institute Inc.

Schumacker, R.E. & Lomax, R.G. (1996). A beginners guide to structural equations modeling. Hillsdale, NJ: Lawrence Erlbaum Associates.

Schwab, D. (1980). Construct validity in organizational behavior. Research in Organizational Behavior: Vol. 4. JAI Press.

Shapira, Z., & Zevulun, E. (1979). On the use of facet analysis in organizational behavior research: Some conceptual considerations and an example. Organizational behavior and human performance, 23, 411-428.

Sheehy, J. W. (1990). New work ethic is frightening. Personnel Journal, 69(6), 28-36.

Sheldon, M. (1971). Investments and involvements as mechanisms producing commitment to the organization. Administrative Science Quarterly, 16, 143-150.

Slater, C. (1959). Some factors associated with internalization of motivation towards occupational performance. Unpublished doctoral dissertation, University of Michigan.

- Smallwaters.com (1998). AMOS home page [online]. Available:
<http://www.smallwaters.com/amos/>
- Smith, H. (1975). Strategies of social research. Englewood Cliffs, N.J.: Prentice Hall.
- Smith, P. C., & Kendall, L. M. (1963). Retranslation of expectations: An approach to the construction of unambiguous anchors for rating scales. Journal of Applied Psychology, 74, 149-155.
- Smith, P. C., Kendall, L. M., & Hulin, C. L. (1969). The measurement of satisfaction in work and retirement: A strategy for the study of attitudes. Chicago: Rand McNally.
- Spence, J. (1985). Achievement American style: The rewards and costs of individualism. American Psychologist, 40(9), 1285-1295.
- Spreckelmeyer, K. F. (1995). Places for a work ethic: An appraisal of American workplace design and research. Journal of Architectural and Planning Research, 12, 104-120.
- SPSS Inc. (1997). SPSS for windows (Version 8.0) [Computer Software]. Chicago, IL: SPSS Inc.
- Stevens, J., Beyer, J., & Trice, H. (1978). Assessing personal, role, and organizational predictors of managerial commitment. Academy of Management Journal, 21, 380-396.
- Stoner, J. A., & Wankel, C. (1986). Management (3rd. ed.). Englewood Cliffs, NJ: Prentice-Hall.

- Super, D.E. (1969). The work values inventory. Boston: Houghton Mifflin.
- Szwajkowski, E. (1989). Lessons for the consultant from research on employee misconduct [CD-ROM]. Consultation: An International Journal, 8, 181-190. Abstract from: SilverPlatter File: PsycLIT Item: 77-27111
- Tang, T. L. (1989). Effects of work ethic and task labels on task preference. Journal of Psychology, 123, 429-438.
- Tang, T., & Gilbert, P. (1995). Attitudes toward money as related to intrinsic and extrinsic job satisfaction, stress and work-related attitudes. Personality and Individual Differences, 19, 327-332.
- Taveggia, T. C. & Ziemba, T. (1978). Linkages to work: A study of the "central life interest" and "work attachments" of male and female workers. Journal of Vocational Behavior, 12, 303-320.
- Tesser, A., & Krauss, H. (1976). On validating a relationship between constructs. Educational and Psychological Measurement, 36, 111-122.
- Thorndike, R.L. (1949). Personnel selection: Tests and measurement techniques. New York: Wiley.
- Tilgher, A. (1930). Homo faber: Work through the ages. Translated by D. C. Fisher. New York: Harcourt Brace.
- Tinsley, H. E. A. & Tinsley, D. J. (1987). Uses of factor analysis in counseling psychology research. Journal of Counseling Psychology, 34(4), 414-424.
- U.S. Department of Commerce. (1980). Standard occupational classification manual (2nd ed.). Washington, DC: U.S. Government Printing Office.

Venkatraman, N. & Grant, J. H. (1986). Construct measurement in Organizational Strategy Research: A critique and proposal. Journal of Management Review, 11(1), 71-87.

Vroom, V. (1962). Ego-involvement, job satisfaction, and job performance. Personnel Psychology 15, 159-177.

Watson, E. H. (1993). A comparison of self-perceived occupational work ethics of general education and tech prep students. Unpublished master's thesis, The University of Tennessee, Knoxville.

Watts, G. A. (1992). Work values, attitudes and motivations of women employed in administrative support occupations. Journal of Career Development, 19(1), 49-64.

Wayne, F. R. (1984). An instrument to measure adherence to the protestant ethic and contemporary work values. Unpublished doctoral dissertation, Arizona State University.

Wayne, F. (1989). An instrument to measure adherence to the Protestant ethic and contemporary work values. Journal of Business Ethics, 8, 793-804.

Webb, E.J., Campbell, D.T., Swartz, R.D., & Sechrest, L. (1966). Unobtrusive measures: Nonreactive research in the social sciences. Chicago: Rand McNally

Weber, M. (1904,1905). Die protestantische ethik und der geist des kapitalismus. Archiv fur sozialwissenschaft. Translated by T. Parsons. The protestant ethic and the spirit of capitalism. New York: Scribner's.

Wollack, S., Goodale, J., Witjing, J., & Smith, P. (1971). Development of the survey of work values. Journal of Applied Psychology, 55, 331-338.

Yankelovich, D. (1981). New rules: Searching for self-fulfillment in a world turned upside down. New York: Random House.

Yankelovich, D., & Harmon, S. (1988). Starting with the people. Boston: Houghton Mifflin.

Zaleznik, A., Christensen, C. R., & Roethlisberger, F. J., with Homans, G. C. (1958). The motivation, productivity, and satisfaction of workers: A prediction study. Boston: Harvard University, Division of Research, Graduate School of Business Administration.

Zippay, A. (1995). Tracing behavioral changes among discouraged workers: What happens to the work ethic? [CD-ROM]. Psychological Reports, 76, 531-543. Abstract from: SilverPlatter File: PsycLIT Item: 83-21441

Zuboff, S. (1983). The work ethic and work organization. In J. Barbash, R. J. Lampaman, S. A. Levitan, & G. Tyler (Eds.), The Work ethic-A critical analysis (pp. 153-181). Madison: University of Wisconsin, Industrial Relations Research Association.

APPENDICES

APPENDIX A
WORK ETHIC SURVEY PACKET

APPENDIX B
LETTERS OF PERMISSION



Department of Psychology

142 Townshend Hall
1885 Neil Avenue Mall
Columbus, OH 43210-1222

Max,

Here's a copy of the PE Scale. Feel free to use it.

I would appreciate learning about your findings.

Good luck on your research.

If you have any questions, please let me know.

Herbert Mirels
Professor

THE UNIVERSITY OF TENNESSEE
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October 1, 1997

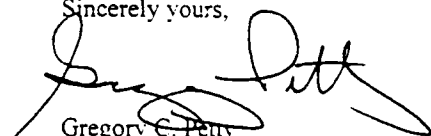
Max Dawson
3902 Wayne Drive
Knoxville, TN 37914

Dear Max,

This letter is to authorize you to use the Occupational Work Ethic Inventory (OWEI, 1991©), for your study investigating the validity of the OWEI.

I will provide you with the necessary information for proper interpretation as well as for instrument reliability and validity. I only ask that you share with me your final results so that your study findings can be included with the Occupational Work Ethic Virtual Research Center.

Sincerely yours,



Gregory C. Petty
Professor and Head

APPENDIX C

AMOS INPUT FILE FOR THE OWEI

\$Standardized
\$SMC
\$Input Variables
we1
we2
we3
we4
we5
we6
we7
we8
we9
we10
we11
we12
we13
we14
we15
we16
we17
we18
we19
we20
we21
we22
we23
we24
we25
we26
we27
we28
we29
we30
we31
we32
we33
we34
we35
we36
we37
we38
we39
we40
we41
we42

```

we43
we44
we45
we46
we47
we48
we49
we50
$Sample Size=841
$raw data
(50F1.0)
21234231232332332143243214321232125312233112311233
71177771711711171111711777711111711117111171111
34334531643345312324234466545422342421152256675456
444544444444444424444344444455454534444444444454444
55355355445736544564434444534535355335431343623453
44446444544744454654322254274564362444242464376225
44343555244534645545455234555255623464244544455542
44555554114524555565245222556555535544222444566553
52566445145525665555456233444344434445254553444454
4754753377346444231431177417333416255554444747741
63466764235525554555256122455555513454144551455555
53454564565453454454534454345345434545434543463453

```

```

$Mods=4
$Structure
we22 = (1) Interpersonal + (1) e22
we16 = Interpersonal + (1) e16
we19 = Interpersonal + (1) e19
we50 = Interpersonal + (1) e50

```

```

we10 = (1) Initiative + (1) e10
we49 = Initiative + (1) e49
we6 = Initiative + (1) e6

```

we38 = Initiative + (1) e38
we5 = Initiative + (1) e5

we8 = (1) Dependable + (1) e8
we12 = Dependable + (1) e12
we23 = Dependable + (1) e23
we1 = Dependable + (1) e1

we41 = (1) Devoted + (1) e41
we48 = Devoted + (1) e48

APPENDIX D

AMOS OUTPUT FILE FOR THE OWEI

Amos
Version 3.6 (w32)
by James L. Arbuckle

Copyright 1994-1997 SmallWaters Corporation
1507 E. 53rd Street - #452
Chicago, IL 60615 USA
773-667-8635
Fax: 773-955-6252
<http://www.smallwaters.com>

```
*****  
*                                           *  
*-----*  
*                                           *  
*****
```

Serial number 55501773

User-selected options

Output:

Maximum Likelihood

Output format options:

Compressed output

Minimization options:

Technical output
Modification indices at or above 4
Standardized estimates
Squared multiple correlations
Machine-readable output file

Sample size: 841

Your model contains the following variables

we22	observed	endogenous
we16	observed	endogenous
we19	observed	endogenous
we50	observed	endogenous
we10	observed	endogenous
we49	observed	endogenous
we6	observed	endogenous
we38	observed	endogenous
we5	observed	endogenous
we8	observed	endogenous
we12	observed	endogenous
we23	observed	endogenous
we1	observed	endogenous
we41	observed	endogenous
we48	observed	endogenous
Interpersonal	unobserved	exogenous
e22	unobserved	exogenous
e16	unobserved	exogenous
e19	unobserved	exogenous
e50	unobserved	exogenous
Initiative	unobserved	exogenous
e10	unobserved	exogenous
e49	unobserved	exogenous
e6	unobserved	exogenous
e38	unobserved	exogenous
e5	unobserved	exogenous
Dependable	unobserved	exogenous
e8	unobserved	exogenous
e12	unobserved	exogenous
e23	unobserved	exogenous
e1	unobserved	exogenous
Devoted	unobserved	exogenous
e41	unobserved	exogenous
e48	unobserved	exogenous

Number of variables in your model: 34

Number of observed variables: 15
 Number of unobserved variables: 19
 Number of exogenous variables: 19
 Number of endogenous variables: 15

Summary of Parameters

	Weights	Covariances	Variances	Means	Intercepts	Total
Fixed:	19	0	0	0	0	19
Labeled:	0	0	0	0	0	0
Unlabeled:	11	6	19	0	0	36
Total:	30	6	19	0	0	55

The model is recursive.

Model: Your_model

Computation of Degrees of Freedom

Number of distinct sample moments: 120
 Number of distinct parameters to be estimated: 36

 Degrees of freedom: 84

Minimization History

0e 10	0.0e+00	-2.0546e-01	1.00e+04	2.85407170448e+03	0	1.00e+04
1e* 0	2.3e+02	0.0000e+00	2.07e+00	7.37733878581e+02	20	7.24e-01
2e 0	5.6e+01	0.0000e+00	6.92e-01	5.31923188256e+02	6	0.00e+00
3e 0	1.3e+02	0.0000e+00	7.63e-01	3.56541250536e+02	2	0.00e+00
4e 0	2.5e+02	0.0000e+00	7.03e-01	2.84135176179e+02	1	7.65e-01
5e 0	2.7e+02	0.0000e+00	2.70e-01	2.49118748338e+02	1	1.17e+00
6e 0	3.1e+02	0.0000e+00	1.10e-01	2.42418563547e+02	1	1.15e+00
7e 0	3.2e+02	0.0000e+00	4.02e-02	2.41891176848e+02	1	1.06e+00
8e 0	3.2e+02	0.0000e+00	3.71e-03	2.41885639347e+02	1	1.01e+00
9e 0	3.2e+02	0.0000e+00	4.79e-05	2.41885638571e+02	1	1.00e+00

Minimum was achieved

Chi-square = 241.886
 Degrees of freedom = 84
 Probability level = 0.000

Maximum Likelihood Estimates

Regression Weights:	Estimate	S.E.	C.R.	Label
we22 <----- Interpersonal	1.000			
we16 <----- Interpersonal	0.886	0.081	10.918	
we19 <----- Interpersonal	0.779	0.079	9.881	

we50 <----- Interpersonal	0.870	0.096	9.037
we10 <----- Initiative	1.000		
we49 <----- Initiative	1.106	0.096	11.476
we6 <----- Initiative	0.899	0.094	9.586
we38 <----- Initiative	1.095	0.105	10.423
we5 <----- Initiative	0.609	0.088	6.951
we8 <----- Dependable	1.000		
we12 <----- Dependable	0.719	0.061	11.872
we23 <----- Dependable	0.704	0.064	10.940
we1 <----- Dependable	0.719	0.066	10.903
we41 <----- Devoted	1.000		
we48 <----- Devoted	0.854	0.047	18.324

Standardized Regression Weights:

Estimate

we22 <----- Interpersonal	0.544
we16 <----- Interpersonal	0.617
we19 <----- Interpersonal	0.508
we50 <----- Interpersonal	0.443
we10 <----- Initiative	0.502
we49 <----- Initiative	0.714
we6 <----- Initiative	0.482
we38 <----- Initiative	0.557
we5 <----- Initiative	0.310
we8 <----- Dependable	0.773
we12 <----- Dependable	0.541
we23 <----- Dependable	0.483
we1 <----- Dependable	0.481
we41 <----- Devoted	0.823
we48 <----- Devoted	0.786

Covariances:

Estimate

S.E.

C.R.

Label

Interpersonal <-----> Initiative	0.211	0.029	7.220
Interpersonal <-----> Dependable	0.297	0.037	8.104
Initiative <-----> Dependable	0.189	0.029	6.516
Interpersonal <-----> Devoted	0.353	0.037	9.423
Initiative <-----> Devoted	0.318	0.034	9.309
Dependable <-----> Devoted	0.338	0.036	9.299

Correlations:

Estimate

Interpersonal <-----> Initiative	0.531
Interpersonal <-----> Dependable	0.525
Initiative <-----> Dependable	0.376
Interpersonal <-----> Devoted	0.640
Initiative <-----> Devoted	0.647
Dependable <-----> Devoted	0.483

Variances:

Estimate

S.E.

C.R.

Label

Interpersonal	0.447	0.064	6.976
Initiative	0.354	0.053	6.621
Dependable	0.717	0.071	10.159
Devoted	0.683	0.056	12.235
e22	1.061	0.064	16.679
e16	0.571	0.038	14.862
e19	0.781	0.045	17.366
e50	1.388	0.076	18.316

e10	1.053	0.059	17.986
e49	0.416	0.033	12.643
e6	0.943	0.052	18.239
e38	0.943	0.055	17.104
e5	1.240	0.063	19.717
e8	0.482	0.052	9.340
e12	0.896	0.052	17.203
e23	1.167	0.064	18.140
e1	1.231	0.068	18.169
e41	0.326	0.035	9.431
e48	0.309	0.027	11.432

Squared Multiple Correlations:

Estimate

we48	0.617
we41	0.677
we1	0.231
we23	0.233
we12	0.293
we8	0.598
we5	0.096
we38	0.310
we6	0.233
we49	0.510
we10	0.252
we50	0.196
we19	0.258
we16	0.381
we22	0.296

Modification Indices

Covariances:

M.I.

Par Change

e12 <-----> Initiative	5.015	-0.048
e12 <-----> e48	5.349	0.053
e12 <-----> e41	6.080	-0.062
e5 <-----> Devoted	5.319	-0.068
e5 <-----> Initiative	5.309	0.055
e38 <-----> Dependable	4.641	0.070
e38 <-----> e23	4.512	0.085
e6 <-----> e8	7.432	0.084
e6 <-----> e5	19.723	0.175
e49 <-----> e48	7.139	0.046
e49 <-----> e12	4.454	-0.055
e49 <-----> e6	5.386	-0.060
e10 <-----> Initiative	6.344	0.056
e10 <-----> e48	13.911	-0.091
e10 <-----> e41	5.187	0.061
e10 <-----> e5	6.748	0.109
e10 <-----> e6	8.746	0.111
e50 <-----> e6	11.223	-0.143
e50 <-----> e49	22.553	0.152
e19 <-----> Dependable	5.758	0.070
e19 <-----> Initiative	4.730	0.043
e19 <-----> e12	6.790	0.084
e16 <-----> e6	7.750	0.081
e22 <-----> Dependable	5.548	-0.081
e22 <-----> Initiative	11.747	-0.080
e22 <-----> Interpersonal	6.366	0.065
e22 <-----> e50	11.785	0.159

Variances:

M.I. Par Change

Regression Weights:

M.I. Par Change

we48 <-----	we12	5.786	0.049
we48 <-----	we10	11.150	-0.064
we41 <-----	we12	6.210	-0.055
we41 <-----	we10	4.509	0.045
we23 <-----	Devoted	6.456	0.132
we23 <-----	Initiative	7.443	0.207
we23 <-----	we48	4.515	0.092
we23 <-----	we41	5.604	0.092
we23 <-----	we38	8.779	0.098
we23 <-----	we49	5.325	0.097
we23 <-----	we19	4.787	0.083
we12 <-----	we49	5.770	-0.090
we12 <-----	we19	4.611	0.072
we8 <-----	we6	5.000	0.062
we5 <-----	Devoted	4.011	-0.104
we5 <-----	we48	5.952	-0.106
we5 <-----	we6	13.967	0.131
we5 <-----	we10	4.618	0.071
we5 <-----	we50	5.714	-0.071
we38 <-----	Dependable	5.687	0.117
we38 <-----	we23	7.703	0.080
we38 <-----	we19	4.671	0.075
we6 <-----	we8	5.086	0.072
we6 <-----	we5	17.378	0.124
we6 <-----	we10	6.018	0.072
we6 <-----	we50	7.897	-0.075
we6 <-----	we16	4.385	0.076
we49 <-----	we48	4.697	0.063
we49 <-----	we50	20.856	0.091
we10 <-----	Dependable	7.937	-0.143
we10 <-----	Interpersonal	7.330	-0.179
we10 <-----	we48	11.025	-0.137
we10 <-----	we23	4.253	-0.062
we10 <-----	we12	5.114	-0.074
we10 <-----	we8	5.739	-0.081
we10 <-----	we5	5.948	0.077
we10 <-----	we6	6.230	0.083
we10 <-----	we50	4.625	-0.061
we50 <-----	we23	4.308	-0.071
we50 <-----	we6	6.847	-0.100
we50 <-----	we49	9.799	0.143
we50 <-----	we22	7.330	0.093
we19 <-----	we23	5.189	0.059
we19 <-----	we12	8.794	0.085
we19 <-----	we38	5.087	0.062
we16 <-----	we12	4.082	0.052
we16 <-----	we6	7.154	0.070
we22 <-----	Dependable	4.468	-0.110
we22 <-----	Initiative	7.656	-0.206
we22 <-----	we12	4.105	-0.068
we22 <-----	we5	4.121	-0.066
we22 <-----	we38	5.729	-0.078
we22 <-----	we6	4.110	-0.070
we22 <-----	we49	5.734	-0.099
we22 <-----	we50	8.884	0.086

Summary of models

Model	NPAR	CMIN	DF	P	CMIN/DF
Your_model	36	241.886	84	0.000	2.880
Saturated_model	120	0.000	0		
Independence_model	15	2533.833	105	0.000	24.132

Model	RMR	GFI	AGFI	PGFI
Your_model	0.057	0.963	0.947	0.674
Saturated_model	0.000	1.000		
Independence_model	0.247	0.582	0.522	0.509

Model	DELTA1 NFI	RHO1 RFI	DELTA2 IFI	RHO2 TLI	CFI
Your_model	0.905	0.881	0.936	0.919	0.935
Saturated_model	1.000		1.000		1.000
Independence_model	0.000	0.000	0.000	0.000	0.000

Model	PRATIO	PNFI	PCFI
Your_model	0.800	0.724	0.748
Saturated_model	0.000	0.000	0.000
Independence_model	1.000	0.000	0.000

Model	NCP	LO 90	HI 90
Your_model	157.886	115.144	208.270
Saturated_model	0.000	0.000	0.000
Independence_model	2428.833	2268.578	2596.431

Model	FMIN	F0	LO 90	HI 90
Your_model	0.288	0.188	0.137	0.248
Saturated_model	0.000	0.000	0.000	0.000
Independence_model	3.016	2.891	2.701	3.091

Model	RMSEA	LO 90	HI 90	PCLOSE
Your_model	0.047	0.040	0.054	0.728
Independence_model	0.166	0.160	0.172	0.000

Model	AIC	BCC	BIC	CAIC
Your_model	313.886	315.284	581.821	520.331
Saturated_model	240.000	244.660	1133.117	928.151
Independence_model	2563.833	2564.416	2675.473	2649.852

Model	ECVI	LO 90	HI 90	MECVI
-----	-----	-----	-----	-----
Your_model	0.374	0.323	0.434	0.375
Saturated_model	0.286	0.286	0.286	0.291
Independence_model	3.052	2.861	3.252	3.053

Model	HOELTER .05	HOELTER .01
-----	-----	-----
Your_model	370	407
Independence_model	44	47

Execution time summary:

Minimization:	0.276
Miscellaneous:	0.784
Bootstrap:	0.000
Total:	1.060

VITA

Max Bradley Dawson was born in North Carolina on May 12, 1958. He received Associate and Baccalaureate degrees in Engineering Technology in 1978 and 1981. He received a Master of Science degree in Technological and Adult Education in 1989. Max has been employed by The University of Tennessee for seventeen years in the capacity of Engineer for the Department of Audiology and Speech Pathology. During the period of completion of the Ph.D. degree in Education in May, 1999, Max also taught a graduate course in Foundations of Workforce Training. Future plans include obtaining a faculty position, with research and teaching responsibilities.