



## UNITED STATES AIR FORCE RESEARCH LABORATORY

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### A PSYCHOMETRIC EXAMINATION OF THE MULTIDIMENSIONAL WORK ETHIC PROFILE AMONG AIR FORCE ENLISTED PERSONNEL

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## Table of Contents

NOTICES.....	iv
PREFACE.....	v
SUMMARY.....	vi
INTRODUCTION.....	1
METHOD.....	6
RESULTS.....	6
DISCUSSION.....	10
FUTURE RESEARCH.....	11
REFERENCES.....	12

## PREFACE

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## SUMMARY

The present study presents an examination of the psychometric properties of the Multidimensional Work Ethic Profile (MWEP) developed by Michael Miller and David Woehr (Miller & Woehr, 1997; Woehr & Miller, 1997). The MWEP is a multidimensional measure of work ethic based on previous research and literature focusing on work ethic and job performance. Originally developed based on a sample of university students, the MWEP has demonstrated good psychometric characteristics including reliability and convergent and discriminate validity. The MWEP has been suggested as a potentially valuable screening tool with Air Force enlisted personnel. The purpose of the present study was to provide a preliminary evaluation of the measure among Air Force enlisted personnel. Results indicate that the measure does in fact demonstrate similar psychometric characteristics among Air Force enlisted personnel as with the original developmental sample. The MWEP provides reliable and valid measures of multiple dimensions underlying the work ethic construct. These results indicate that the MWEP may be a useful screening tool for Air Force Personnel.

# AN PSYCHOMETRIC EXAMINATION OF THE MULTIDIMENSIONAL WORK ETHIC PROFILE AMONG AIR FORCE ENLISTED PERSONNEL

## INTRODUCTION

### *History and Definition of Work Ethic*

The term "work ethic" was coined centuries ago by post-Reformation intellectuals who opposed the practice of social welfare and professed the importance of individualism (Byrne, 1990). They espoused the belief that human beings must assume full responsibility for their lot in life and the poor were no exception. As such, hard work was viewed as a panacea and through it, one could improve his or her condition in life. Implicit in this assumption was the belief that the poor simply needed to help themselves through diligent labor and all life's ills would vanish. Such were the harsh origins of the construct.

Modern formulations of the work ethic construct stem from the work of the German scholar Max Weber. It was in 1904 and 1905 that Weber wrote a two-part essay entitled "The Protestant Ethic and the Spirit of Capitalism". In this essay Weber advanced the thesis that the introduction and rapid expansion of capitalism and the resulting industrialization in Western Europe and North America was in part the result of the Puritan value of asceticism (i.e., scrupulous use of time, strict self-denial of luxury, worldly pleasure, ease, and so on to achieve personal discipline) and the belief in a calling from God (Byrne, 1990; Charlton, Mallinson, & Oakeshott, 1986; Fine, 1983; Furnham, 1990a; Green, 1968; Lehmann, 1993; Maccoby, 1983; Nord, Brief, Atieh, & Doherty, 1988; Poggi, 1983). It was the practice of asceticism that Weber believed produced the celebrated 'work ethic'--the complete and relentless devotion to one's economic role on earth (Lessnoff, 1994). An individual's economic role was prescribed by the belief in a calling (Gilbert, 1977). The manifestation of occupational rewards through success in one's calling came to be revered as a sign of being one of the elect (i.e., chosen by God to receive salvation). Thus, economic activity was a vehicle toward economic success and economic success was a sign of salvation.

Weber maintained that other Protestant faiths (e.g., Calvinism, Methodism, Pietism, and Baptists) shared common theological underpinnings in terms of being proponents of asceticism and the spirit of capitalism (Bouma, 1973; Nelson, 1973); thus the term "Protestant Work Ethic" (PWE). However, the premise that work ethic is a religiously oriented concept was contested then and since. In fact, researchers have found little relationship between religious orientation and endorsement of the work ethic (Giorgi & Marsh, 1990; Ray, 1982). Ray (1982) concluded that all religious orientations currently share the attributes associated with the work ethic to the same degree. He states that the Protestant ethic, "...is certainly not yet dead; it is just no longer Protestant" (p. 135). This is consistent with Pascarella's (1984) contention that all major religions have espoused the importance of work. Thus, it appears that what was originally conceived as a religious construct is now likely secular and is best viewed as general work ethic

and not the PWE.

Since the work ethic is not a surrogate for religious orientation the question becomes, What is it? Current conceptualizations tend to view the work ethic as an attitudinal construct pertaining to work oriented values. An individual espousing a high work ethic would place great value on: hard work, autonomy, fairness, wise and efficient use of time, delay of gratification, and the intrinsic value of work (Cherrington, 1980; Dubin, 1963; Furnham, 1984; Ho & Lloyd, 1984; Weber, 1958; Wollack, Goodale, Wijting, & Smith, 1971). Therefore, work ethic seems to be made up of multiple components. These components appear to include: industriousness, asceticism, self-reliance, morality, delay of gratification, and the centrality of work. In the absence of a firmly accepted conceptual and operational definition it is posited that work ethic is a construct that reflects a constellation of attitudes and beliefs pertaining to work oriented behavior. Characteristics of "work ethic" are that it: (a) is multidimensional; (b) pertains to work and work related activity in general, not specific to any particular job (yet may generalize to domains other than work - school, hobbies, etc.); (c) is learned (not dispositional); (d) refers to attitudes and beliefs (not necessarily behavior); (e) is intended as a motivational construct (should be reflected in behavior); and (e) is secular, not necessarily tied to any one set of religious beliefs.

#### *Relevance of Work Ethic to the Air Force*

As previously defined, individual differences in work ethic should reflect differences among individuals in terms of their attitudes and beliefs with respect to the value of work and work-related behavior. An important consideration for industrial psychology is the relationship between these attitudes and beliefs and actual work behavior. While industrial psychologists interested in the work ethic have typically explored its relationship with other attitudinal variables such as job satisfaction (e.g., Aldag & Brief, 1975; Blood, 1969; Stone, 1975, 1976; Wanous, 1974), job involvement (e.g., Blau, 1987; Randall & Cote, 1991; Saal, 1978), and organizational commitment (e.g., Kidron, 1978; Morrow & McElroy, 1987), there have been relatively few studies (e.g., Khaleque, 1992; Orpen, 1986), focusing on the relationship of work ethic with actual job performance. A possible reason for this is the lack of distinction between task and contextual aspects of job performance.

Recently several models of job performance have been proposed which attempt to describe a set of underlying dimensions that are representative of performance in all jobs (Borman & Motowidlo, 1993; Campbell, 1990; Campbell, McCloy, Oppler, & Sager, 1993). For example, Campbell (1990) argues that all jobs are made up of eight factors, including: job-specific task proficiency, non-job-specific task proficiency, written and oral communication, demonstrating effort, maintaining personal discipline, facilitating team and peer performance, supervision and leadership, and management and administration. Campbell's formulation distinguishes between behaviors that contribute to organizational effectiveness through their focus on task proficiency and those behaviors that help the organization in other ways (Motowidlo & Van Scotter, 1994). Task proficiency behaviors are formally prescribed by the

organization whereas other behaviors, though not formally a part of the job, are still very valuable for organizational effectiveness (Borman & Motowidlo, 1993).

Borman and Motowidlo (1993) place performance behaviors not prescribed by the organization under the rubric of contextual activities. Examples include:

- (1) Volunteering to carry out task activities that are not formally a part of the job.
- (2) Persisting with extra enthusiasm or effort when necessary to complete own task activities successfully.
- (3) Helping and cooperating with others.
- (4) Following organizational rules and procedures even when personally inconvenient.
- (5) Endorsing, supporting, and defending organizational objectives. (p. 73)

Using a sample comprising Air Force mechanics, Motowidlo and Van Scotter (1994) demonstrated that supervisors consider task performance and contextual performance separately when providing performance ratings. It is the contextual component of job performance in which work ethic may offer substantial predictive utility. Specifically, it may be possible to predict with a measure of work ethic the extent to which an individual would engage in contextual performance of value to the unit. Further, the work ethic may demonstrate a relationship with technical school training success, job performance, and tenure in the Air Force.

#### *Measurement of Work Ethic*

Of paramount concern for research focusing on the understanding of the work ethic construct as well as the relationship between work ethic and work behavior is the ability to accurately measure the construct. There are at least seven work ethic measures in existence which purport to provide reliable and valid measures of this construct. However, there are a number of problems with these measures. First and foremost, they focus on the measurement of a single construct by providing a global "work ethic" score. This is a considerable shortcoming as, since its inception, Weber believed the work ethic to be a multidimensional construct; a position that has subsequently been supported by numerous researchers (Bouma, 1973; Cherrington, 1980; Furnham, 1984; Oates, 1971).

From a psychometric as well as a conceptual perspective, the lack of focus on the multidimensional nature of the work ethic is troubling. The use of a single overall score could potentially cause the loss of information with regards to the different components of work ethic as well as their relationships with other constructs (Carver, 1989; McHoskey, 1994). Further, the use of a single score in studies using different instruments to measure the work ethic may at least partially explain the equivocal results often found in the literature (Furnham, 1984). That is, one cannot be sure if the conflicting results are due to a lack of robustness in the studies, the scales measuring different components of the work ethic, or deficiencies in terms of construct relevance and psychometric properties (Furnham, 1990b).

A second concern is that the various measures appear to tap different components of the work ethic and not the construct in its entirety. This has often lead to poor intercorrelations among measures. For example, Furnham (1990b) administered seven measures of the work ethic to 1,021 participants and found that the correlations between the various measures ranged from 0.19 - 0.66 with a mean  $r$  of 0.36. One would expect the values to be much higher if the scales were indeed measuring the same thing.

Finally, another potential problem with existing work ethic measures is that these measures are relatively dated. The mean time since publication for the previous measures is 23 years. The age of the measures poses the problem of many dated items. For example, some of the items contain sex-biased language such as: "Hard work makes a man a better person", "The man who can approach an unpleasant task with enthusiasm is the man who gets ahead", and "To be superior a man must stand alone".

Factor analytic investigations of the various measures have found the existence of several identifiable factors (Furnham, 1990b; Heaven, 1989; Tang, 1993; Mirels & Garrett, 1971; McHoskey, 1994). For example, McHoskey (1994) factor analyzed Mirels and Garrett's Protestant Ethic scale. His analysis yielded a 4-factor solution, which he labeled, "success", "asceticism", "hard-work", and "anti-leisure". However, McHoskey was quick to point out that though this scale was multidimensional, other important aspects of the PWE were absent. Specifically, it in no way measured an individual's attitudes toward morality, self-reliance, or delay of gratification. This lack of comprehensiveness in measuring the work ethic has been levied against other scales as well and limits their utility (Furnham, 1984, 1990a, b; McHoskey, 1994).

In an effort to ameliorate the shortcomings in previous attempts to measure the work ethic, Woehr and Miller (1997) and Miller and Woehr (1997) developed the Multidimensional Work Ethic Profile (MWEP). The goal in the development of such a measure was to build on and extend previous measures in an attempt to capture the multidimensionality of the construct. The MWEP is a 65-item measure assessing 7 dimensions related to the work ethic construct. These dimensions are: "*Delay of Gratification*", "*Hard Work*", "*Morality/Ethics*", "*Self-Reliance*", "*Leisure*", "*Wasted Time*", and "*Centrality of Work*". Complete definitions of these dimensions are provided in Table 1.

Originally developed based on a sample of university students, the MWEP has demonstrated good psychometric characteristics including reliability and convergent and discriminate validity. Specifically, Miller and Woehr (1997) report 3 - 4 week test-retest reliabilities of 0.83 - 0.95 and internal consistency coefficient alphas of 0.78 - 0.89 for the dimensions of work ethic. With regards to construct-related validity the MWEP demonstrated discriminant relationships with personality, cognitive ability, and manifest needs. Lastly, the criterion-related validity of the MWEP was evaluated by relating it to academic effort indices pertinent to the university student sample. The MWEP was shown to be significantly related to

hours studying per week (0.21), hours watching TV per week (0.36), hours in extracurricular activities per week (0.26), and classes missed (0.30).

Table 1.  
Dimension definitions for the 7 work ethic dimensions assessed by the MWEP.

<b>Dimension:</b>	<b>Definition:</b>
Hard Work	Belief in the virtues of hard work.
Self-Reliance	Striving for independence in one's daily work.
Leisure	Pro-leisure attitudes and beliefs in activities that serve a rejuvenating function.
Centrality of Work	Belief in work for work's sake and the importance of work.
Morality/Ethics	Believing in a just and moral existence.
Delay of Gratification	Orientation toward the future; the postponement of rewards.
Wasted Time	Attitudes and beliefs reflecting active and productive use of time.

### *Present Study*

Given the previous evaluations of the MWEP and the potential for use as a screening measure among Air Force enlisted personnel, the objective of this study was to empirically determine the extent to which the psychometric properties of the MWEP that have been found with a university student sample would generalize to Air Force enlisted personnel. Measurement stability across the samples would allow for greater confidence with regards to measurement equivalence and provide an initial indication of the viability of the MWEP for use in the Air Force.

As noted, the primary objective of the present study was to compare the psychometric characteristics of the MWEP with Air Force personnel relative to the original student development sample. This comparison focused on (1) the mean score levels on each dimension, (2) score variability for each dimension, (3) the reliability for each dimension, and (4) the overall pattern of correlations among dimensions. If the MWEP functions similarly across the two samples no differences in dimension variability, dimension reliability, or the overall pattern of correlations among dimensions should be found. However, differences in mean levels on each dimension are likely given the actual differences across the two samples. That is, the student sample represents 18 to 22-year-old college students. Alternately, the Air Force sample represents an 18 to 22-year-old non-college bound sample. It is likely that actual differences in work ethic attitudes and beliefs exist across the two groups. Such differences would be reflected in mean dimension score differences.

## METHOD

### University Participants.

The university student sample comprised 598 participants (52% female and 48% male). Subject participation was voluntary and subjects received partial course credit for taking part in the study.

### Air Force Participants.

Participants in the present study were 268 Air Force enlisted personnel that participated in the study during Basic Military Training (BMT). The participants were 95% male and 5% female. Further, 71% were White, 15% Black, 8% Hispanic, 4% Asian, and 2% Other. Mean age of the participants was 19.5 years of age and ranged from 18 to 35.

### Multidimensional Work Ethic Profile (MWEP) Measure.

The MWEP was originally developed as a 65-item paper-and-pencil measure. The measure requires responses to items on a 5 point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). In order to facilitate data collection in the present study the MWEP was included as part of a computer-administered battery of questionnaires. Thus a computer-administered version of the MWEP was developed. Although computer-administered this version was highly similar to the paper-and-pencil version. Both items and response options were displayed in the same manner in both forms. Participants were asked to respond to each of the items via the numbers on the computer keyboard.

### Procedure.

The MWEP was administered as part of an extensive battery of computer-administered questionnaires completed in a single 4-hour session during the first week of BMT. Subjects were seated at individual computer terminals and given the measures. Administration of the measures was counterbalanced across experimental sessions.

## RESULTS

As noted, comparison of the MWEP in the two samples focused on 1) the mean score levels on each dimension, 2) score variability for each dimension, 3) the reliability for each dimension, and 4) the overall pattern of correlations among dimensions. Mean scores for each of the 7 work ethic dimensions for both the Air Force and student samples are presented in Table 2.

Table 2.

Means and standard deviations for the 7 work ethic dimensions for both the Student and Air Force Samples.

	Student Sample N = 598		Air Force Sample N = 268		
<b>Dimension:</b>	<b>Mean</b>	<b>SD</b>	<b>Mean</b>	<b>SD</b>	<b>t</b>
Centrality of Work	24.34	6.04	20.79	6.03	8.01*
Delay of Gratification	16.95	4.52	14.08	4.18	8.85*
Hard Work	22.09	5.86	16.81	5.45	12.52*
Leisure	28.63	5.86	31.50	5.81	-6.68*
Morality/Ethics	16.08	4.45	13.90	3.21	8.15*
Self-Reliance	26.11	6.88	24.84	6.79	2.51
Wasted Time	19.96	4.71	16.10	4.34	11.41*

\*  $p < .01$ .

Tests for differences between the mean scores for each dimension are also presented in Table 2. These results indicate significant mean differences for all dimensions except the self-reliance dimension. Further, means are higher for the student sample than for the Air Force sample for all dimensions except the leisure dimension. Thus, the student sample had significantly higher mean scores for the centrality of work, delay of gratification, hard work, morality/ethics, and wasted time dimensions. The Air Force sample had a significantly higher mean score on the leisure dimension and no significant difference was for the self-reliance dimension.

Table 3 provides the results of a comparison of the variance of each dimension across samples. These results indicate no significant differences for any of the dimensions across samples except morality/ethics. For the morality/ethics dimension there is significantly less variability in scores for the Air Force sample than for the student sample.

Table 3.  
 Test for equality of variances across student and Air Force Samples.

Dimension	Student Sample Variance	Air Force Sample Variance	Levine's Test for Equality of Variances	
			F	Significance
Centrality of Work	36.48	36.36	.088	.767
Delay of Gratification	20.43	17.47	2.60	.107
Hard Work	34.33	29.70	1.173	.279
Leisure	34.33	33.76	.187	.665
Morality/ethics	19.80	10.30	26.301	.000
Self-Reliance	47.33	46.10	.136	.713
Wasted Time	22.18	18.84	1.586	.208

Dimension reliabilities (coefficient  $\alpha$ ) for both samples are presented in Table 4. Examination of these results indicates no differences in dimension reliabilities across samples except for the morality/ethics dimension. Specifically, all dimension reliabilities are with .02 of each other across samples except for the morality/ethics dimension for which the reliability is substantially lower in the Air Force sample.

Table 4.  
 Test for equality of reliabilities across student and Air Force Samples.

Dimension	Student Sample Reliability	Air Force Sample Reliability
Centrality of Work	.84	.85
Delay of Gratification	.79	.78
Hard Work	.85	.87
Leisure	.87	.87
Morality/ethics	.78	.55
Self-Reliance	.89	.86
Wasted Time	.79	.77

Finally, the dimension intercorrelations for both the Air Force and student samples are presented in Table 5. In order to assess the extent to which the dimension intercorrelations differed across samples, we used LISREL 8.14 (Joreskog & Sorbom, 1993) to provide an overall test of the equivalence of the 2 correlation matrices. Specifically, we built a model in which correlations among the 7 work ethic dimensions were set equal to the student sample based correlations and the correlations for the Air Force sample were constrained to be equal to those from the student sample. Using this approach, the overall model fit indices derived from the LISREL analyses provide an indication of the overall equality of the correlations across samples. Results of this analysis are provided in Table 6 and indicate that the two sets of correlations are generally equivalent.

Table 5.  
Work ethic dimension intercorrelations for the student and Air Force samples.

	Student	Sample					
Dimensions:	1	2	3	4	5	6	7
1. Centrality of Work	1.0						
2. Delay of Gratification	.38	1.0					
3. Hard Work	.33	.33	1.0				
4. Leisure	-.47	-.12	-.08	1.0			
5. Morality/Ethics	.17	.25	.22	.08	1.0		
6. Self-Reliance	.20	.21	.38	.10	.13	1.0	
7. Wasted Time	.56	.40	.38	-.28	.21	.32	1.0

  

	Air Force	Sample					
Dimensions:	1	2	3	4	5	6	7
1. Centrality of Work	1.0						
2. Delay of Gratification	.52	1.0					
3. Hard Work	.48	.56	1.0				
4. Leisure	-.44	-.26	-.23	1.0			
5. Morality/Ethics	.34	.44	.48	-.16	1.0		
6. Self-Reliance	.20	.11	.23	-.02	.18	1.0	
7. Wasted Time	.62	.55	.59	-.34	.46	.26	1.0

Student Sample  $N = 598$ . All correlations are significant ( $p < .01$ ).

Air Force Sample  $N = 268$ . All correlations greater than .17 are significant ( $p < .01$ ).

Table 6.  
 Goodness of fit indices for the test of intercorrelation equivalence.

$\chi^2$	df	$\chi^2/df$	RMSEA	GFI	NFI	CFI	RFI
72.30	42	1.72	.04	.92	.95	.98	.95

## DISCUSSION

The present study presents an examination of the psychometric properties of the Multidimensional Work Ethic Profile (MWEP) developed by Michael Miller and David Woehr (Miller & Woehr, 1997; Woehr & Miller, 1997). The MWEP is a 65-item measure of work ethic based on previous research and literature focusing on work ethic and job performance. An important characteristic of the MWEP is that it assesses 7 conceptually and empirically distinct facets of the work ethic construct. Originally developed based on a sample of university students, the MWEP has demonstrated good psychometric characteristics including reliability and convergent and discriminate validity. Further, the MWEP has been suggested as a potentially valuable screening tool with Air Force enlisted personnel. The purpose of the present study was to provide a preliminary evaluation of the measure among Air Force enlisted personnel. Results indicate that the measure does in fact demonstrate similar psychometric characteristics among Air Force enlisted personnel as with the original developmental sample. The MWEP provides reliable and valid measures of multiple dimensions underlying the work ethic construct. These results indicate that the MWEP may be a useful screening tool for Air Force Personnel.

Specifically, results of the present study found no differences across samples for the dimension variances, reliabilities, and intercorrelations across dimensions. One exception to these findings was for the “*Morality/Ethics*” dimension. For this dimension the results indicated significantly less variance as well as substantially lower reliability with the Air Force sample relative to the student sample. One possible explanation for this finding may lie in differences in the work settings of the two samples. That is, the student sample was assessed in a non-job setting while the Air Force sample was assessed in an actual job setting. It is likely that the items comprising the “*Morality/Ethics*” dimension are fairly transparent and actual job incumbents may not respond as truthfully as non-incumbents. This would result in the restricted variance found in the Air Force sample. This reduced variance would in turn result in a lower reliability estimate. Counter to this explanation, however, was our finding that the mean response for the “*Morality/Ethics*” dimension was actually significantly lower in the Air Force sample relative to the student sample. If the items were relatively transparent and the incumbent sample was simply responding in a more socially desirable manner then one would expect a higher mean score. It is difficult at this point to determine the exact reasons for the differences found across

samples for this dimension. The lack of difference across the other, more work-related dimensions, however, is encouraging.

The results of this study do indicate significant mean score differences for 6 of the 7 dimensions across samples. These differences are not unexpected and do not call into question the measurement equivalence of the MWEP in either sample. Rather, these differences are to a certain extent consistent with expected differences between the two samples. The student sample represents young adults attending college. Alternately, the Air Force sample represents young adults not attending college but directly entering the work force. Thus, differences in work ethic scores most likely reflect actual differences between samples.

The measurement equivalence shown between student and non-student samples in this study provides substantial support for the use of the MWEP in different populations. Indeed, 6 of the 7 dimensions showed similar variances, reliabilities, and dimension intercorrelations. These results provide strong evidence for the generalizability of the MWEP for use with non-student samples.

### **FUTURE RESEARCH**

The prediction of job performance is one of the benchmarks of industrial psychology. Though the field has relied primarily on cognitive ability measures to predict performance, it has also pursued the use of alternative predictors (Arvey & Sackett, 1993). One of the most prevalent alternative predictors has been personality variables (Adler, 1996; Barrick & Mount, 1991; Goffin, Rothstein, & Johnston, 1996; Hogan, Hogan, & Roberts, 1996; Horman & Maschke, 1996; Tett, Jackson, & Rothstein, 1991). Though measures of personality have not resulted in adverse impact, many researchers have found a low relationship with actual criterion measures of job performance (Ones, Mount, Barrick, & Hunter, 1994). Another potential problem is that personality variables may not function in a linear fashion. Attitudinal variables such as work ethic may bridge the gap between cognitive ability and personality variables.

The results of this study demonstrate that one such attitudinal measure, the MWEP, demonstrates good psychometric characteristics in two diverse samples. This suggests that the MWEP is a potentially valuable pragmatic measure for either sample. Certainly, the next step is to examine the predictive utility of the MWEP in an Air Force context. A proposed avenue of research for the future would be an examination of the relationship of the work ethic to technical school training success, job performance, and tenure in the Air Force. This could be achieved through the administration of the MWEP to enlisted personnel while in BMT and following up on their respective progress in the Air Force. The criteria in this example might be technical school final grade, performance evaluations while at the duty station, and fulfillment of enlistment tour requirements.

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