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THE DEVELOPMENT AND VALIDATION OF A PERSONOLOGICAL MEASURE OF WORK DRIVE

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ABSTRACT: Using six studies based on 23,823 individuals in diverse settings, we developed and validated a personality measure of Work Drive—a disposition to work long hours and extend oneself for one's job. The factor structure was confirmed in four settings. Work Drive was related to job performance showing incremental validity beyond cognitive aptitude and Big Five personality traits in five validation studies. It predicted academic performance at six different grade levels, even beyond Big Five traits. Construct validity was examined via work values, job involvement, normal personality scales, satisfaction measures, and cognitive ability. Little adverse impact was found. Occupational groups differed on Work Drive. Overall validity and areas of application were discussed.

KEY WORDS: work drive; personality and job performance; cognitive aptitude; Big Five.

The purpose of this study was to develop and validate a personological measure of an individual's disposition to work long hours and extend oneself, when needed, to meet job demands and achieve job success. We term this personality construct *work drive*. The impetus for this measure comes from a widespread emphasis in the workplace on working long hours—including putting in long hours per day for one's job or profes-

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sion, overtime work, weekend work, and taking work home—to meet job demands, fulfill company goals, and increase productivity.

Working long hours is one of the key factors driving company productivity and, from a macro-economic perspective, gross national product and per capita productivity (National Council on Economic Education, 2002; Industry Canada, 2002). The number of hours worked per week has been steadily rising for several decades in the United States, where workers put in the longest hours of any industrialized country (CNN, 2001; Raghavan, 2002). Schor (1992) found that annual hours worked increased by 163 for the typical American worker from 1969 to 1987. The trend toward long working hours appears to be occurring in many developing and industrialized countries (Cooper, 2001; CNN, 2000, 2001). At the level of the individual, a number of studies have shown a positive relationship between hours worked and both job productivity and organization advancement (Blau, 1986, 1993; Leong, Randall, & Cote, 1994; Liddle, Westergren, & Duke, 1997; Burke & McKeen, 1995). Moreover, other studies have shown that putting forth extra effort to complete tasks and going beyond normal job expectations is positively related to job performance (e.g., MacKenzie, Podsakoff, & Fetter, 1993; Werner, 1994; MacKenzie, Podsakoff, & Rich, 2001).

It should be noted that our conceptualization of Work Drive differs from *work ethic* or *Protestant work ethic*, which has been heavily researched and is typically conceived as a set of attitudes, beliefs, or values about the general importance of work for society and personal or moral character, the negative value of idleness and laziness, and the rewards of working hard—especially monetary outcomes and material prosperity (see, for example, Mirels & Garrett, 1971; Buchholz, 1978; Greenberg, 1978; Feather, 1984; Tang, 1993; Mudrack, 1993; Blau & Ryan, 1997). Our conceptualization of Work Drive can also be distinguished from three other cognate constructs: 1) *Work centrality* (e.g., Dubin, 1956; Paullay, Alliger, & Stone-Romero, 1994) which is a general belief measure defined as the degree of importance that work, in general, plays in one's life (*ibid.*). 2) *Workaholism* (e.g., Robinson, 1996; Porter, 1996; Seybold & Salomone, 1994), which focuses primarily on the negative or dysfunctional aspects of excessive work and variously considers workaholics to be addicted to work (Robinson, 1996), obsessive-compulsively fixated on work (Seybold & Salomone, 1994), having work-personal life imbalance (Burke, 2001), and feeling driven to work because of inner pressures with low work enjoyment (Spence & Robbins, 1992).3) *Job involvement* (e.g., Lodahl & Kejner, 1965; Kanungo, 1982), which is a motivational construct reflecting "a person's orientation toward a particular job" (Cook, Hepworth, Wall, & Warr, 1981) and is a measure of psychological state not trait. Our Work Drive measure was constructed as a personal disposition or trait, reflecting an individual's characteristic behavior at

work and general orientation toward work which is not limited to a specific job. It was designed to be used for hourly and salary jobs in any type of organization, with a broad range of potential applications, including pre-employment and promotional selection, placement, career planning and career transition services, coaching and mentoring, personnel research, and succession planning.

The present investigation comprises six sets of studies. First, a Work Drive scale was developed, its factor structure confirmed, and internal consistency reliability examined in a variety of settings. Second, the criterion-related validity of Work Drive was analyzed in terms of relationship to job performance, including incremental or unique validity predicting job performance controlling for both cognitive aptitude and Big Five personality traits. Third, to assess validity relations for Work Drive at different stages of the lifespan, we evaluated the validity of Work Drive in predicting academic success individually as well as above and beyond Big Five personality traits for six different grade-levels of middle and high school students. Fourth, the construct validity of our Work Drive measure was explored in terms of relationships to logically related constructs, including Protestant work ethic, work centrality, job involvement, and work values; normal personality traits, including the 16 PF, NEO-PIR, and Myers Briggs Temperament Inventory; career, job, and life satisfaction; and measures of cognitive aptitude and general intelligence. Fifth, we looked at the potential for adverse impact in using the Work Drive measure in employment selection by examining whether there were significant mean differences between whites, African-Americans, and Hispanics as well as between males and females, and workers over 40 versus under 40 years of age (utilizing the Equal Employment Opportunity cutoff for age bias). Sixth, we investigated whether occupational groups differed on Work Drive.

STUDY 1

Overview

The purpose of this study was initial scale construction and reliability analysis. A set of 12 items were written by the first and second authors to reflect the construct specification of Work Drive as a disposition to work long hours, take on extra responsibilities at work, display a high level of energy at work, and to see oneself as being a hard worker compared to other people. After a series of pilot studies involving applicants for a variety of jobs with an industrial-organizational psychology firm specializing in pre-employment testing, a set of nine items was chosen for our Work Drive scale. The initial factor analysis, confirmatory factor analysis, and reliability estimations were conducted in four settings—

candidates for production worker positions in a U.S. based, Japanese-owned automotive parts manufacturer, candidates for customer service representative positions for an international telecommunications company, professional and managerial clients of an international career transition services company, and managerial candidates for a national fuel distribution and convenience store company.

Participants

Automotive Parts Company. Data were collected on 3888 candidates, with 69% male (31% female); 92% white/Caucasian, 6% African-American, and 2% other; and median age of 29.

Telecommunications Company. Data were collected on 940 candidates, with 31% male (69% female); 21% white/Caucasian, 17% African-American, 58% Hispanic, and 4% other; and median age of 27.

Career Transition Services Company. Data were collected on: a) 502 professionals in wide range of occupational categories, of whom 50.5% were male (49.5% female) and a median age in the 40–49 range; and b) 730 managers at various levels, of whom 66% were male (34% female) and a median age in the 40–49 range. Race/ethnicity data were not available.

Fuel Distribution–Convenience Store Company. Data were collected on 814 candidates, with 69% male (31% female). Race/ethnicity and age data were not available.

Measures

In each case, the Work Drive scale was part of larger battery of personality and/or cognitive aptitude measures. Individuals taking the Work Drive scale were asked to choose one of five boxes between two bipolar verbal anchors. Shown below are five sample items from our scale

I don't tend to work more hours every week than most people I know.	□ □ □ □ □ 1 2 3 4 5	I tend to work more hours every week than most people I know.
I would *not* say that I have more work drive and energy than most people.	□ □ □ □ □ 1 2 3 4 5	I would say that I have more work drive and energy than most people.
I don't like to take on extra responsibilities and duties in my work.	□ □ □ □ □ 1 2 3 4 5	I like to take on extra responsibilities and duties in my work.

The activities which give me the greatest satisfaction in life involve *my work*. (Reverse coded)	□ □ □ □ □ 1 2 3 4 5	The activities which give me the greatest satisfaction in life involve *my family and personal life* away from the job.
I would keep working even if I didn't need the money. (Reverse coded)	□ □ □ □ □ 1 2 3 4 5	I would not keep working if I didn't need the money.

Results

To evaluate the initial factor structure of the Work Drive scale, a principal components factor analysis was performed (using Version 11.5 of the Statistical Package for the Social Sciences, SPSS, 2003) on data from the automotive sample, revealing one common factor. A confirmatory factor analysis (CFA) was then performed in all four samples using maximum likelihood estimation procedure via Amos Version 4.0 (Arbuckle & Wothke, 1999). For overall model evaluation, the goodness-of-fit index (GFI) and adjusted goodness-of-fit index (AGFI) were used. The resulting fit indices by sample were Automotive—GFI = .95, AGFI = .93; Telecommunications—GFI = .97, AGFI = .93; Transition Services Professional—GFI = .98, AGFI = .93; Transition Services Manager—GFI = .96, AGFI = .91; and Fuel Distribution/Convenience Store—GFI = .98, AGFI = .95. These results provide consistently good support for the one-factor model of Work Drive and its constituent items.

In addition, internal consistency reliability was assessed by Cronbach's alpha. Coefficient alphas for the five samples were: Automotive—.83, Telecommunications—.80, Transition Services Professional—.83, Transition Services Manager—.81, and Fuel Distribution/Convenience Store—.80.

STUDY 2

Overview

The purpose of this set of analyses was to examine the criterion-related validity of the Work Drive scale in relation to job performance. We also examined the incremental validity of Work Drive after controlling for Big Five personality traits by themselves and in conjunction with cognitive aptitude measures. In the latter case, given the nearly universal validity of general mental ability or cognitive aptitude in predicting job performance (Hunter, 1986; Schmidt & Hunter, 1998), we entered cognitive aptitude measures first in the regression equation to predict job performance. Also, in view of the extensive emerging literature on the job-related validity of the Big Five personality constructs (Barrick

& Mount, 1991; Tett, Jackson, & Rothstein, 1991; Hogan, 1996; Judge, Higgins, Thoresen, & Barrick, 1999), we next entered Big Five personality measures into the hierarchical regression analysis to predict overall job performance. Finally, we entered the Work Drive measure as a third step in the hierarchical regression analyses to assess its unique validity after controlling for cognitive aptitude and Big Five personality variables.

All analyses were derived from concurrent validation studies conducted in five organizational settings by an industrial-organizational employment testing firm: (1) 238 workers in a statewide (southeastern U.S. state) agricultural extension service; (2) 105 entry-level skilled manufacturing workers in a tire production plant; and (3) 188 production technicians in a large, Japanese-owned/U.S.-based automotive parts manufacturer. (4) 154 employees of Southeastern U.S. bank—including tellers, financial service representatives, and loan officers; and (5) 105 portfolio managers employed by a credit and collections company operating on the west coast of the U.S. Each validation study was based on a job analysis with supervisor ratings of job performance serving as the criterion variable.

Participants

In the Agricultural Extension sample, exact age was not recorded, but 46% were under 40, 55% were males, and 93% white/Caucasian; 6% black/African-American, and 3% "other" ethnic/racial. In the tire production sample, 75% were males; 86% were white/Caucasian, 5% were black/African-American, and 8% were Hispanic, with median age = 43. In the production technician sample, 76% were males; 96% were white/Caucasian, 2% were black/African-American, and 1% were Asian, with median age = 29. In the bank sample, 16% were males and 84% females. No other demographic data were available. In the portfolio managers sample, 47% were males and 53% females. No other demographic data were available.

Measures

Personality. The Big Five traits were assessed via the Resource Associates *Personal Style Inventory*, a work-based normal personality inventory (Lounsbury & Gibson, 2002; Lounsbury, Loveland, Sundstrom, Gibson, Drost, & Hamrick, 2003).

Job Performance. In all five validation studies, overall job performance was assessed by forming a unit-weighted linear composite of individual performance ratings made by the immediate supervisor. The individual

performance ratings were determined by job analysis and included such dimensions as productivity, quality, teamwork, and attendance. Each rating was made on an 8-point scale ranging from 1 "Performance does not meet, or rarely meets, minimum job standards" to 8 "Single best performance I have ever observed".

RESULTS AND DISCUSSION

The bivariate correlations between of job performance with the cognitive aptitude, Big Five personality, and Work Drive measures for all five samples are presented in Table 1. As can be seen, the cognitive aptitude measures were significantly related to job performance in all samples, ranging from a low of $r = .23$ ($p < .05$) in the tire production sample to a high of $r = .33$ ($p < .01$) in the automotive sample. Twelve of the 25 Big Five correlations were significantly related to job performance and all of the Work Drive-job performance correlations were significant, ranging from a low of $r = .24$ ($p < .05$) in the collections sample to a high of $r = .49$ ($p < .01$) in the bank sample.

A series of hierarchical regression analyses were run to assess the incremental validity of Work Drive in predicting job performance. In the first series of analyses, the Big Five personality measures were entered as a set, followed by the Work Drive measure. In the second series of analyses, the cognitive aptitude measure was entered on the first step, followed by the set of Big Five personality measures on the second step, and the Work Drive measure on the third step. The results for both

Table 1
Bivariate Correlations of Overall Job Performance with Cognitive Aptitude, Big Five Personality Traits, and Work Drive by Validation Sample

	Sample				
	Agricultural Extension	Tire	Automotive	Bank	Collections
Cognitive Aptitude	NA	.23*	.33**	.24**	.28**
Agreeableness	.26**	–.07	.15	.42**	–.12
Conscientiousness	.19**	.17	.19*	.30**	.13
Emotional Stability	.14*	.23*	.19*	.48**	.09
Extraversion	.25**	–.07	.08	.36**	–.13
Openness	.25**	.08	.06	NA	NA
Work Drive	.28**	.30**	.46**	.49**	.24*

*$p < .05$; **$p < .01$.

groups of analyses are summarized in Table 2. In all five samples, Work Drive added significantly to the prediction of job performance beyond the Big Five measures, with $R^2\Delta = 2\%$ ($p < .05$) in the agricultural extension sample, $R^2\Delta = 6\%$ ($p < .01$) in the tire production sample, $R^2\Delta = 20\%$ ($p < .01$) in the automotive parts sample, $R^2\Delta = 4\%$ ($p < .01$) in the bank sample, and $R^2\Delta = 7\%$ ($p < .01$) in the collections sample. In addition, Work Drive added significantly to the prediction of job performance beyond all 16 of the 16 PF measures in the automotive parts sample, with $R^2\Delta = 17\%$ ($p < .01$)

As can be seen in Table 2, in all four samples Work Drive added significantly to the prediction of job performance beyond both the cognitive aptitude and Big Five measures, with $R^2\Delta = 7\%$ ($p < .05$) in the tire production sample, $R^2\Delta = 17\%$ ($p < .01$) in the automotive parts sample, $R^2\Delta = 4\%$ ($p < .01$) in the bank sample, and $R^2\Delta = 5\%$ ($p < .01$) in the col-

Table 2
Results of Hierarchical Multiple Regression Regressing Cognitive Aptitude, Personality, and Work Drive Measures on Overall Job Performance by Validation Sample

	Validation Sample				
Step/Variables Entered	Production Technicians ($n = 105$)	Tire Production Workers ($n = 105$)	Tellers, Financial Service, & Loan Officers ($n = 154$)	Portfolio Managers ($n = 154$)	Ag Extension Workers ($n = 238$)
1 Big Five Measures[1]	$R = .319^{**}$ $R^2\Delta = .102^{**}$	$R = .378^{**}$ $R^2\Delta = .143^{**}$	$R = .494^{**}$ $R^2\Delta = .241^{**}$	$R = .303^{**}$ $R^2\Delta = .092^{**}$	$R = .327^{**}$ $R^2\Delta = .107^{**}$
2 Work Drive	$R = .503^{**}$ $R^2\Delta = .151^{**}$	$R = .454^{*}$ $R^2\Delta = .063^{**}$	$R = .532^{**}$ $R^2\Delta = .042^{**}$	$R = .398^{**}$ $R^2\Delta = .067^{**}$	$R = .352^{**}$ $R^2\Delta = .017^{**}$
1 All 16 PF Measures	$R = .289^{**}$ $R^2\Delta = .083$				
2. Work Drive	$R = .502^{**}$ $R^2\Delta = .252^{**}$				
1 Cognitive Aptitude Measures	$R = .332^{**}$ $R^2\Delta = .110^{**}$	$R = .228^{**}$ $R^2\Delta = .052^{**}$	$R = .240^{**}$ $R^2\Delta = .058^{**}$	$R = .282^{**}$ $R^2\Delta = .080^{**}$	
2 Big Five Measures[1]	$R = .428^{**}$ $R^2\Delta = .073^{**}$	$R = .418^{**}$ $R^2\Delta = .123^{**}$	$R = .517^{**}$ $R^2\Delta = .267^{**}$	$R = .359^{**}$ $R^2\Delta = .050^{*}$	
3 Work Drive	$R = .591^{**}$ $R^2\Delta = .166^{**}$	$R = .497^{**}$ $R^2\Delta = .072^{**}$	$R = =.551^{**}$ $R^2\Delta = .037^{**}$	$R = .421^{**}$ $R^2\Delta = .048^{**}$	

[1]For the Bank (Tellers, Financial Service, and Loan Officers) and Credit and Collection (Portfolio Managers) samples Openness was not included in the Big Five Measures.
$^{*}p < .05$; $^{**}p < .01$.

lections sample. In addition, Work Drive added significantly to the prediction of job performance beyond both the cognitive aptitude and all 16 of the 16 PF measures for the automotive parts sample with $R^2\Delta = 17\%$ ($p < .01$). These results indicate that in all samples analyzed, Work Drive contributes significantly to the prediction of job performance beyond that accounted for the Big Five measures as well as by both the Big Five and cognitive aptitude measures. Work Drive also displayed incremental validity beyond the 16 PF measures.

STUDY 3

Purpose

If Work Drive is a relatively enduring personality trait, we would expect it to display a similar pattern of criterion-related validities vis-à-vis performance at different stages of the lifespan (cf. Caspi, 1998; Rothbart, Ahadi, & Evans, 2000), including adolescence. Although it does not make sense in most cases to consider job performance for adolescents down to age 11, academic performance is an important criterion for school students (Paunonen & Nicol, 2001). Indeed, Munson and Rubenstein (1992) contend that "schoolwork is the student's job" and that the "school is a workplace, the student is learner, and the learner is a worker" (p. 289). Accordingly, we contextualized the Work Drive measure to the school setting by changing the frame of reference (cf. Schmit, Ryan, Stierwalt, & Powell, 1995) from "working" and "job" and to "studying" and "schoolwork."

The purpose of this set of analyses was to examine the criterion-related validity of the Work Drive scale in relation to academic performance for adolescents and young adults. In addition, we examined the incremental or unique validity of Work Drive after controlling for Big Five personality traits.These analyses were derived from an employability study of middle and high school students in two Southeastern U. S. school systems (cf. Lounsbury, Gibson, Sundstrom, Wilburn, & Loveland, 2004).

Overview of Research Setting

All data for this study were obtained from an archival source representing data collected in two school systems. "School A" was a semi-rural county school system in Southeastern Tennessee which had 97.6% white students, 1.6% African-American students, and .8% "Other." Data were collected from students in the 6th, and 7th in middle school systems as part of a broader study by the school system of employability and cur-

riculum planning. "School B" was a city school located in Southeastern Tennessee which had 80% white students, 16% African-American students, and 4% "Other." All data for this study were obtained from an archival source collected as part of a larger study by the high school of student characteristics. Data were collected from students in grades 9 through 12.

Participants

School A. A total of 375 6th graders and 248 7th graders participated in this study. The average age of the 6th graders was 11.60 and the average age of the 7th graders was 12.56. The percentages of male and female students by grade were: 6th grade—50%male/50% female; 7th grade—52% male/48% female. Race/ethnic data were not collected.

School B. A total of 1061 students participated in this study, including 276 9th graders, 292 10th graders, 287 11th graders, and 206 12th graders. For the total sample, 49% were male/51% female, and the mean age was 15.47. Race/ethnic data were not collected.

Measures

The Adolescent Personal Style Inventory (Lounsbury, Tatum, Gibson, Park, Sundstrom, Hamrick, & Wilburn, 2003) was used to measure the Big Five Variables of Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness, with each item placed on a five-point Likert scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree and 3 = Neutral/Undecided.The Work Drive measure used here is a nine-item scale representing the adult Work Drive items rewritten for students in school down to grade 6 (Lounsbury, Sundstrom, Loveland, & Gibson, 2003). Five sample items are: "I study more than most students I know"; "I have more energy for schoolwork than most students in my school"; "I always try to do more than I have to in my classes", "Being a good student means a lot to me," and "I would keep going to school even if I didn't have to."

Academic Performance. Academic performance was represented by cumulative grade point average (GPA), which was recorded for each student on a standard 4.0 scale.

RESULTS AND DISCUSSION

The bivariate correlations of GPA with the Big Five and Work Drive measures and GPA for all six five grades are presented in Table 3. With

Table 3
Bivariate Correlations of Grade Point Average with Big Five Personality Traits and Work Drive by Grade

	Grade					
	6th	7th	9th	10th	11th	12th
Agreeableness	.27**	.17**	.30**	.27*	.33**	.27**
Conscientiousness	.22**	.28**	.21**	.21**	.27**	.22**
Emotional Stability	.24**	.22**	.23**	.22**	.11	.03
Extraversion	.24**	.25**	.21**	.14*	.01	–.01
Openness	.15**	.22**	.27**	.17*	.16*	.19*
Work Drive	.26**	.38**	.46**	.34**	.43**	.40**

*$p < .05$; **$p < .01$.

four exceptions, the Big Five measures were significantly related to GPA in all grades and Work Drive was significantly related to GPA in all fix grades, with $r = .26$ ($p < .01$) for the 6th graders, $r = .38$ ($p < .01$) for the 7th graders, $r = .46$ ($p < .01$) for the 9th graders, $r = .34$ ($p < .01$) for the 10th graders, $r = .43$ ($p < .01$) for the 11th graders, and $r = .40$ ($p < .01$) for the 12th graders.

For all six grades, a series of hierarchical regression analyses were run to assess the incremental validity of Work Drive in predicting job performance beyond the Big Five measures, with results summarized by grade in Table 4. In all grades, Work Drive added significantly to the prediction of GPA beyond the Big Five measures, with $R^2\Delta = 2\%$ ($p < .05$) in the sixth grade sample, $R^2\Delta = 4\%$ ($p < .01$) in the seventh grade sample, $R^2\Delta = 13\%$ ($p < .01$) in the ninth grade sample, $R^2\Delta = 6\%$ ($p < .01$) in the tenth grade sample, $R^2\Delta = 8\%$ ($p < .01$) in the eleventh grade sample, and $R^2\Delta = 6\%$ ($p < .01$) in the twelfth grade sample. Thus, Work Drive is significantly related to GPA for all six of the middle and high school samples and it contributes incremental variance to the prediction of GPA beyond the Big Five personality measures in all grades considered.

STUDY 4

Overview

The purpose of this set of analyses was to explore the construct validity of Work Drive by examining its relationship to a broad range of personality traits, psychological values, motivational variables, satisfaction measures, and cognitive variables, including: measures of work ethic, work values, job involvement, Workaholism, and Type A personal-

Table 4
Results of Hierarchical Multiple Regression for Grades 6, 7, 9, 10, 11, and 12 with Work Drive Entered after the Big Five Personality Traits

	Grade					
Step/Variables Entered	Grade 6 ($n = 375$)	Grade 7 ($n = 248$)	Grade 9 ($n = 276$)	Grade 10 ($n = 292$)	Grade 11 ($n = 375$)	Grade 12 ($n = 375$)
1 Big Five Measures	$R = .330^{**}$ $R^2\Delta = .109^{**}$	$R = .297^{**}$ $R^2\Delta = .088^{**}$	$R = .358^{**}$ $R^2\Delta = .128^{**}$	$R = .318^{**}$ $R^2\Delta = .101^{**}$	$R = .416^{**}$ $R^2\Delta = .173^{**}$	$R = .413^{**}$ $R^2\Delta = .171^{**}$
2 Work Drive	$R = .353^{**}$ $R^2\Delta = .016^{*}$	$R = .353^{**}$ $R^2\Delta = .036^{**}$	$R = .506^{**}$ $R^2\Delta = .128^{**}$	$R = .400^{**}$ $R^2\Delta = .059^{**}$	$R = .503^{**}$ $R^2\Delta = .080^{**}$	$R = .483^{**}$ $R^2\Delta = .061^{**}$

$^{*}p < .05$; $^{**}p < .01$.

ity; normal personality traits measured by the 16 PF, NEO-PIR Five Factor model, and Myers-Briggs Type Indicator; job, career, and life satisfaction; and general intelligence and specific cognitive ability tests. Five different samples were used in these analyses: 1) Undergraduates enrolled in psychology courses at a large, southeastern U.S. university. 2) Candidates for managerial positions at a national fuel distribution and convenience store company. 3) Employees of a southeastern U.S. utility company participating in a career planning program. 4) Employees from various Southeastern companies participating in career planning programs. 5) Candidates for various positions in different companies as part of a pre-employment testing program administered by a personnel testing firm.

Participants

Undergraduate Psychology Courses. Data were collected on 155 students with 31% male and 69% female and median age = 20. Race/ethnicity were not available.

Fuel Distribution–Convenience Store Company. Data were collected on 243 candidates, with 67% male (33% female). Race/ethnicity and age data were not available.

Utility Company. Data were collected on 216 employees of whom 69% were male (31% female); 85% were white/Caucasian and 15% were black/African American with median age = 31.

Career Planning Participants in Various Companies. Data were collected on 481 employees of whom 66% were male (34% female); 84% were white/Caucasian and 16% were black/African American with median age = 35.

Candidates for Various Jobs. Of the 108 candidates, 76% were male (24% female); 91% were white/Caucasian and 9% were black/African American with median age = 34.

Measures

In addition to the Work Drive scale, which was used in all samples, the following measures were employed.

Undergraduate Psychology Courses. The measures for this sample were the Protestant Work Ethic Scale (Mirrels & Garret, 1971), Survey of Work Values (Wollack, Goodale, Wijting, & Smith, 1971), job involvement (Lodahl & Kejner, 1965), Workaholism (Spence & Robbins, 1992), Dubin's (1956) central life interest—work, and the NEO-PIR (Costa & McCrae, 1985).

Fuel Distribution–Convenience Store Company. The 16 PF Version 5 (Cattell, Cattell, & Cattell, 1993; Russell & Karol, 1994).

Career Planning Samples. Measures included the Myers-Briggs Temperament Inventory (Myers & McCaulley, 1985) and measures of job, life, and career satisfaction (see Lounsbury & Hoopes, 1986).

Candidates for Various Jobs. Measures included a group intelligence test—the Otis-Lennon Test of Mental Maturity (Otis & Lennon, 1969) as well as five cognitive aptitude tests which have been widely used in personnel selection: the Differential Aptitude Test of Abstract Reasoning (Bennett, Seashore, & Wesman, 1973), the Employee Aptitude Series tests of Numerical Computation, Numerical Reasoning, and Space Visualization (Ruch & Ruch, 1963) and the Bennett Mechanical Comprehension Test (Bennett, 1969).

RESULTS AND DISCUSSION

The correlations of Work Drive with the other measures are displayed in Table 5. Work Drive was significantly and positively correlated with work ethic ($r = .48^{**}$, $p < .01$), Protestant work ethic ($r = .26^{**}$, $p < .01$), central life interest—work ($r = .27^{**}$, $p < .01$), Type A personality ($r = .33^{**}$, $p < .01$) and Workaholism ($r = .55^{**}$, $p < .01$).Work drive was also positively and significantly correlated with four work values—intrinsic ($r = .23^{**}$, $p < .01$), organization man ($r = .23^{**}$, $p < .01$), social status of job ($r = .30^{**}$, $p < .01$), and conventional ethic ($r = .35^{**}$, $p < .01$).

Work Drive was significantly and modestly correlated with 8 of the 16 PF scales—Emotional Resilience ($r = .20^{**}$, $p < .01$), Dominance ($r = .26^{**}$, $p < .01$), Social Boldness ($r = .31^{**}$, $p < .01$), Sensitivity ($r = -.26^{**}$, $p < .01$), Imaginative ($r = -.13^{*}$, $p < .01$) Self-reliance ($r = -.13^{*}$, $p < .01$), Perfectionism ($r = .30^{**}$, $p < .01$), and Tension ($r = -.20^{**}$, $p < .01$). Work drive was positively and significantly related to Extraversion on both the NEO-PIR ($r = .24^{**}$, $p < .01$) and MBTI ($r = .36^{**}$, $p < .01$), as well as Conscientiousness on the NEO-PIR ($r = .40^{**}$, $p < .01$) and the Conscientiousness subscale of Achievement Striving ($r = .47^{**}$, $p < .01$), and the MBTI Feeling dimension ($r = -.20^{**}$, $p < .01$). Although Work Drive was not significantly related to general intelligence or five different tests of cognitive aptitude, it was significantly related to all three satisfaction measures—job satisfaction ($r = .24^{**}$, $p < .01$), career satisfaction ($r = .35^{**}$, $p < .01$), and life satisfaction ($r = .12^{**}$, $p < .01$). Interestingly, Work Drive was negatively and significantly related to the old 16 PF Form A "Fake Good" scale ($r = -.35$, $p < 01$), but not significantly related

Table 5
Correlations Between Work Drive and other Personality, Satisfaction, and Aptitude Measures

Work ethic[1]	.48**	G—Rule-Consciousness	.12	Extraversion (Introversion)	.36**
Protestant Work Ethic[1]	.26**	H—Social Boldness	.31**	Intuitive (Sensing)	.09
Central Life Interest-Work[1]	.27**	I-Sensitivity	–.26**	Feeling (Thinking)	–.20**
Job Involvement[1]	.45**	L—Vigilance	.02	Perceiving (Judging)	.06
Type A Personality[1]	.33**	M—Imaginative	–.13*	Satisfaction Scales[4]:	
Workaholism[1]	.55**	O—Self-Confidence	.11	Job Satisfaction	.24**
Survey of Work Values[1]:		Q1—Openness to Change	.06	Career Satisfaction	.35**
Intrinsic	.23**	Q2—Self-reliance	–.13*	Life Satisfaction	.12**
Organization man ethic	.23**	Q3—Perfectionism	.31**	Cognitive Tests[5]:	
Upward striving	.01	Q4—Tension	–.20*	DAT Abstract Reasoning[5]	.08
Social status of job	.30**	Impression Management	.10	EAS Numerical Reasoning[5]	–.04
Conventional ethic	.35**	Fake Good[4]	–.35**	EAS Numerical Computation[5]	–.04
Attitudes toward earnings	.16	NEO-PIR Scales[2]:		EAS Space Visualization[5]	.19
16 PF 5th ed. Scales[2]:		Neuroticism	.09	Bennett Mechanical Comprehension Test[5]	.01
A—Social Warmth	–.09	Extraversion	.24**	Otis Lennon Test of Mental Maturity[1]	.02
B—Reasoning	–.12	Openness	.01		
C—Emotional Resilience	.20**	Agreeableness	–.07		
E—Dominance	.26**	Conscientiousness	.40**		
F—Liveliness	–.05	Achievement-Striving	.47**		
		Myers-Briggs Temperament Inventory[3]:			

[1]N = 146 to 157 undergraduates enrolled in psychology courses.
[2]N = 244 candidates for managerial positions in a Fuel Distribution Company.
[3]N = 216 utility employees participating in a career development program.
[4]N = 481 employees from various companies participating in a career planning program.
[5]N = 93 to 108 candidates for various jobs in different companies as part of a pre-employment testing program administered by a personnel testing firm.
[6]From the 16 PF Form A (Institute for Personality and Ability Testing, 1978).

to the newer 16 PF scale of impression management (r = .10, n.s.)—suggesting that Work Drive may not be heavily imbued with positive self-report bias.

STUDY 5

Overview

Since our Work Drive measure could be used in a variety of employment selection situations, and, in fact, has already been used as one component of pre-employment testing programs for many different jobs, the

question arises whether there are differences between Title VII-protected groups (as defined by the Uniform Guidelines on Employee Selection Procedures, 1978) on Work Drive scores. We used archival data sets from an industrial-organizational psychology consulting firm to test for mean differences in Work Drive between males and females; among whites/Caucasians, blacks/African-Americans, and Hispanics; and between individuals under 40 versus 40 and over years of age. Eight different samples were used in these analyses: 1) incumbents in production technician positions in a U.S. based, Japanese-owned automotive parts manufacturer, 2) candidates for customer service representative positions for an international telecommunications company, 3) incumbents in production jobs in a steel manufacturing company, 4) candidates for store manager positions for an international convenience store company, 5) managerial candidates for a national fuel distribution and convenience store company, 6) professional and managerial clients of an international career transition services company, 7) employees from various Southeastern companies participating in career planning programs, and 8) candidates for various hourly production positions in a variety of manufacturing companies.

Participants

Automotive Parts Company. Data were collected on 623 employees, with 69.5% male (30.5% female); 81% white/Caucasian, and 19% black/African-American; and 70% under 40 years old (30% 40 and over).

Telecommunications Company. Data were collected on 847 candidates, with 31% male (69% female); 21% white/Caucasian, 17% African-American, 58% Hispanic, and 4% other; and 86% under 40 years old (14% 40 and over).

Steel Company. Data were collected on 842 employees, with 89% male (11% female); 91% white/Caucasian and 19% African-American; and 77% under 40 years old (23% 40 and over).

Convenience Retailer. Data were collected on 2500 candidates, with 67% male (33% female) Race/ethnicity and age data were not available.

Fuel Distribution–Convenience Store Company. Data were collected on 243 candidates, with 67% male (33% female). Race/ethnicity and age data were not available.

Career Transition Services Company. Data were collected on: 2737 individuals, with 50% male (50% female). Race/ethnicity data were not available.

Career Planning Participants in Various Companies. Data were collected on 481 employees of whom 66% were male (34% female); 84% were white/Caucasian and 16% were black/African; and 44% under 40 years old (56% 40 and over).

Candidates for Hourly Production Jobs. Of the 1198 candidates, 78% were male (22% female); 92% were white/Caucasian and 8% were black/African American; and 88% under 40 years old (12% 40 and over).

Measures

The same Work Drive scale in the above studies was used in all eight samples.

RESULTS AND DISCUSSION

Mean Work Drive scores were computed for each subgroup, then independent samples t tests were used to compare males and females, blacks and whites, and those under 40 versus 40 and over in the various samples. A one-way analysis of variance was used to compare the mean scores for whites, blacks, and Hispanics in the one sample where there were enough cases in each group to permit such an analysis. The results of these tests are displayed in Table 6.

There were no significant differences in mean Work Drive scores between males and females for any of the eight samples. Also, there were no significant differences in mean Work Drive scores for whites versus blacks in five samples. In the telecommunications sample, Hispanics were found to have a significantly higher mean Work Drive score than blacks and whites, which did not differ from each other. Only two significant differences were observed in mean Work Drive scores between individuals under 40 and 40 and over: For both the automotive and career planning samples, those under 40 had significantly higher Work Drive scores than individual 40 and over in age ($t(620) = 2.76$, $p < .01$ and $t(475) = 2.49$, $p < .05$, respectively). In sum, taking these results as a whole, there appears to be no potential adverse impact of Work Drives on females, blacks, or Hispanics, with mixed evidence for adverse impact on individuals 40 years and older.

STUDY 6

Overview

There is an extensive literature on personality constructs in relation to occupational and career choice as well as vocational development and

Table 6
Results of Tests for Mean Difference on Work Drive for Sex, Age, and, Racial/Ethnic Groups

	Comparison Groups						
	Males vs. Females			*Under 40 vs. 40+ yrs.*			
Sample	Mean/SD	Mean/SD	*t* Test	Mean/SD	Mean/SD	*t* Test	
Automotive Parts	3.86/.53	3.78/.54	$t(621) = 1.65$	3.88/.54	3.74/.51	$t(620) = 2.76^{**}$	
Telecommunications	3.83/.64	3.84/.62	$t(844) = .06$	3.84/.62	3.81/.64	$t(842) = .54$	
Steel	3.90/.54	3.84/.64	$t(840) = .81$	3.90/.55	3.83/.55	$t(840) = 1.57$	
Convenience Stores	4.00/.56	4.01/.57	$t(2498) = .11$	NA	NA	NA	
Career Transition	3.09/.78	3.10/.79	$t(2725) = .31$	3.09/.80	3.10/.77	$t(2725) = .18$	
Fuel Distribution	3.77/.50	3.82/.56	$t(241)=.63$	NA	NA	NA	
Career Planning	3.27/.51	3.18/.59	$t(454) = 1.65$	3.28/.51	3.16/.56	$t(475) = 2.49^{*}$	
Hourly Production	3.76/.55	3.74/.54	$t(1196) = .53$	3.82/.54	3.80/.52	$t(479) = .57$	
	Whites vs. Blacks			*Whites*	*Blacks*	*Hispanics*	
Sample	Mean/SD	Mean/SD	*t* Test	Mean/SD	Mean/SD	Mean/SD	F test
Automotive Parts	3.78/.53	3.84/.53	$t(620) = 1.01$	NA	NA	NA	NA
Telecommunications	NA	NA	NA	3.81/.65	3.71/.61	3.89/.63	$F(2,811) = 5.09^{**}$
Steel.	3.89/.55	3.87/.60	$t(827) = .27$	NA	NA	NA	NA
Career Planning	3.26/.52	3.28/.52	$t(827) = .27$	NA	NA	NA	NA
Hourly Production	3.77/.73	3.83/.53	$t(425) = .50$	NA	NA	NA	NA

Notes: Mean scores with a common subscript do not differ significantly from each other at the $p < .01$ level.
Some sample sizes in a row differ because of missing demographic information.
$^{*}p < .05$; $^{**}p < .01$.

career success (see, e.g., Tokar, Fischer, & Subich, 1998; Holland, 1996; Judge, Higgins, Thoresen, & Barrick, 1999). In Study 2 above, Work Drive was found to be significantly and positively related to job and career satisfaction. However, as noted by Osipow (1971) and Crites (1969), one important characteristic of a personality construct for it to be useful in such fields as career development, occupational planning, vocational guidance, employment counseling, and job placement, is that it should function as an individual differences variable which, when aggregated, can differentiate occupations. Accordingly, in this study, we examined whether there are differences in Work Drive among various occupations. Specifically, using archival data from the sample of clients of career transition services company (see Study 3), we compared mean differences in Work Drive scores for occupational groups where there were at least one hundred individuals in an occupational grouping.

Participants

Of the total sample of 4878, 60% were male; 40% were female. Relative frequencies by age group were: Under 30—8%; 30–39—29%; 40–49—37%, and 50 and over—26%. Many different occupations were listed by these individuals. For occupations for which the sample size was over 100, the following frequencies were observed: Accountant—110, Business-General—117, Clerical—140, Consultant—551, Customer Service—170, Engineering & Science—237, Executive—255, Financial Services—272, Human Resources—380, Information Technology—783, Manager—902, Manufacturing—194, Marketing—333, and Sales—417. No other demographic variables were available.

Measures

The same Work Drive scale used in the above studies was used in this study.

RESULTS AND DISCUSSION

Mean Work Drive scores were computed for each occupational group. A one-way analysis of variance was used to compare the mean scores: $F(13, 4856) = 16.75$, $p < .01$), which indicates that there were significant differences in mean Work Drive score between occupations. *Tukey b* post hoc tests were used to identify homogenous subgroups, with results displayed in Table 7.

There were six homogenous groups of occupations identified by the *Tukey b* test, with some overlap between adjacent groups. The lowest

Table 7
Occupations Grouped into Homogenous Subsets on Mean Work Drive Score

Occupation	Mean Work Drive Score
Clerical	2.94[a]
Engineering & Science	3.12[a,b]
Customer Service	3.27[b,c]
Business General	3.31[b,c,d]
Manufacturing	3.31[b,c,d]
Financial Services	3.32[b,c,d]
Information Technology	3.32[b,c,d]
Consulting	3.33[b,c,d]
Human Resources	3.36[c,d]
Accounting	3.40[c,d,e]
Sales	3.45[c,d,e]
Marketing	3.53[d,e,f]
Management	3.60[e,f]
Executive	3.70[f]

Notes: The above groupings are based on the results of *Tukey b* post hoc tests performed at the .05 probability level. Occupations with a common subscript do not differ significantly from each other on mean Work Drive scores at the $p < .05$ level.

scoring group on the Work Drive measure is composed of Clerical and Engineering while the highest scoring group is composed of Marketing, Management, and Executive occupations. It is interesting to note that the relative ordering of occupations by Work Drive score is similar to an ordering that would be obtained if one used typical hours worked per week for each occupation. For example, Top Level Executives typically work 60 hours/week or more and many individuals working in Marketing work 50 hours /week or more, while Clerical staff and Engineers typically work about 40 hours/week (U. S. Department of Labor, 2003). Using data on typical hours worked per week for the different occupations (*ibid.*), we correlated average Work Drive score with estimated hours worked per week and found a .70 correlation. This estimate should be interpreted with caution as it based on only 14 cases, limited sample sizes within occupations, and approximate indices of hours worked; however, it does suggest that there is some degree of correspondence between aggregated Work Drive scores for an occupation and the typical hours worked/week by members of that occupation.

GENERAL DISCUSSION

The present series of studies, which involved a total of 23,823 individuals in a variety of jobs and work settings as well as students in

middle and high schools, was successful in developing a reliable and valid Work Drive measure. A fairly high level of internal consistency reliability was demonstrated and the factor structure was confirmed for large samples in four settings. The results of Study 2 indicate not only the *criterion-related validity* for Work Drive in terms of overall performance for five jobs, but *incremental validity* was also established for Work Drive: a) above and beyond Big Five personality traits; and b) above and beyond both cognitive aptitude *and* Big Five variables. This study demonstrates the importance of the Work Drive construct in terms of its significance and unique relationship to job performance beyond the personality constructs normally related to job performance. Study 3 demonstrates the criterion-related and incremental validity of Work Drive in relation to academic performance of middle and high school students, which reinforces the proposition that Work Drive is a personality trait that displays significant performance-related validities at different stages of the lifespan. The incremental validity in job and academic performance for Work Drive can be seen as another example of the value of narrow personality traits in relation to the Big Five for conceptually linked criteria (e.g., Paunonen, 1998; Paunonen & Nicol, 2001).

The results of Study 4 provide evidence for the *construct validity* (Messick, 1989) of the Work Drive measure, with moderate, significant correlations found between Work Drive and: Protestant work ethic, central life interest-work, job involvement, Type A behavior, and Workaholism as well as several dimensions of the Survey of Work Values. These findings indicate that Work Drive is related to cognate constructs to which we would expect it to be related. Some of the significant correlations between Work Drive and normal personality measures, such as extraversion, conscientiousness, dominance, achievement striving, and emotional resilience are interesting in their own right and point toward areas for future research to explain the basis for relationship. Considering the results of Study 4 as a whole, the Work Drive construct appears to have substantial nomological network validity (Messick, 1989) and extensive nomothetic span (Embretson, 1985). The relationship between Work Drive and other logically related constructs not studied here, such as the PRF Achievement and PRF Endurance measures, could also be examined. It is interesting to note that Work Drive was positively related to workaholism, which has been found to be related to job stress and depression (Carroll & Robinson, 2000; Spence & Robbins, 1992), while Work Drive in our study was positively related to emotional resilience and negatively related to tension.

The results of Study 5 indicate no significant differences between men and women on the Work Drive measure. In only two out of six samples did we find a significant difference in Work Drive between people under 40 versus 40, with the under-40 individuals having a higher Work

Drive. In addition, we did not find any adverse impact of Work Drive on African Americans or Hispanics. Coupled with the validity findings of Study 2, these results augur well for the future usage of Work Drive in personnel selection and employment decisions.

Based on the results of Study 4 and Study 6, the Work Drive measure may be useful in research and practice in the areas of careers, occupations, and vocational behavior. We found a positive correlation between Work Drive and career satisfaction as well as job satisfaction and, to a lesser extent, life satisfaction. It appears that occupational groups can be differentiated on the basis of Work Drive and, as would be expected from our construct definition, there is significant correspondence between Work Drive and the number of hours worked in an occupation.

Overall, the results of the present investigation provide multiple forms of support for the psychometric integrity and construct validity of the Work Drive measure and its potential usefulness in different settings, including employment selection, personnel and organizational research, job placement, career planning, school and educational research, and vocational guidance. From a societal perspective, it would be interesting to assess inter-national and intra-national distributions of Work Drive, potential differences in Work Drive as a function of demographic and geographic characteristics, as well as to evaluate trends over time. Hopefully, future studies on the Work Drive measure can extend its validity by examining other types of construct relationships in different business, organizational, occupational, educational, and cultural settings.

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