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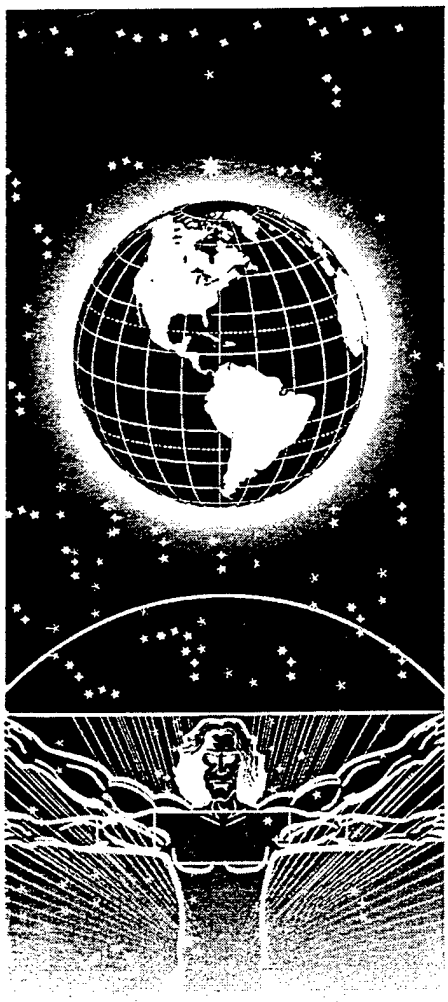

UNITED STATES AIR FORCE RESEARCH LABORATORY

THE RELATIONSHIP BETWEEN WORK EXPERIENCE AND JOB PERFORMANCE: A CONCEPTUAL AND META-ANALYTIC REVIEW

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The purpose of the present study is to develop a conceptual framework to enhance our understanding of the meaning and measurement of the work experience construct. To this end, we conducted a conceptual review of the work experience literature, developed a framework for measuring different facets of work experience, and conducted a meta-analysis to examine the relationship between the different measures of work experience and job performance.

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PREFACE

An earlier version of this paper was presented at the 23rd International Congress of Applied Psychology in Madrid, Spain, July 1994. A substantial portion of this research was conducted while Miguel A. Quiñones was a Research Associate for the Air Force Office of Scientific Research Summer Faculty Research Program at the Air Force Human Resources Laboratory, Brooks AFB, TX.

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The Relationship Between Work Experience and Job Performance: A Conceptual and Meta-Analytic Review

Work experience is perhaps one of the most commonly encountered concepts in personnel research and practice. Work experience is relevant for many human resource functions such as selection (e.g., Ash & Levine, 1985), training (e.g., Ford, Quiñones, Sego, & Sorra, 1992), and career development (e.g., Campion, Cheraskin, & Stevens, 1994; McCall, Lombardo, and Morrison, 1988). Given the importance of work experience for human resource practice and research, it is not surprising that a fair amount of research has examined the concept and its relationship with important outcomes such as job performance.

Early studies concluded that work experience was not as important for successful job performance as had been previously thought (e.g., Fiedler, 1970). A meta-analysis by Hunter and Hunter (1984), however, found a correlation of .18 between work experience and job performance. Later work by Schmidt, Hunter, & Outerbridge (1986) used path analysis to examine more theoretical hypotheses regarding the role of work experience in predicting job performance. Finally, a meta-analysis by McDaniel, Schmidt, & Hunter (1988) found a mean corrected correlation of .32 between work experience and job performance across a number of occupations.

In a review of the work experience literature, Ford, Sego, Quiñones, and Speer (1991) found that most studies used time on the job, or tenure, to measure work experience (e.g., McDaniel, Schmidt, & Hunter, 1988). However, other studies have measured experience by counting the number of times an individual has performed a given task (cf. Lance, Hedge, & Alley, 1989; Vance, Coovert, MacCallum, & Hedge, 1989). The literature on job rotation has operationalized experience as the number of lateral moves an individual receives within a specified period of time (Campion, Cheraskin, and Stevens, 1994). Another approach has focused on the actual content of the experiences as a critical determinant of job performance (Mumford & Stokes, 1992). Finally, some have argued that individuals can differ in the "lessons" they draw from similar experiences (McCall, Lombardo, & Morrison, 1988).

Researchers have noted this lack of consistency in the definition and measurement of work experience and have called for further research which examines the nature of the work experience construct (e.g., DuBois & McKee, 1994; Ford, Sego, Quiñones, & Speer, 1991; Hofmann, Jacobs, & Gerras, 1992; Lance, Hedge, & Alley, 1989; Rowe, 1988; Teachout, 1991). These researchers have noted that not all measures of work experience are the same. For instance, work experience can be defined as either the number of months spent in a particular job (job tenure), or the number of times a particular task has been performed. However, there is empirical evidence which suggests that two individuals with equal amounts of job tenure can differ drastically in the number and types of tasks they perform (Ford et al., 1992; Schmitt & Cohen, 1989).

These findings suggest that the construct of work experience is complex and closer attention needs to be paid to its definition and measurement. The purpose of the present study is to develop a conceptual framework to enhance our understanding of the meaning and measurement of the work experience construct. To this end, we conducted a conceptual review of the work experience literature, developed a framework for measuring different facets of work experience, and conducted a meta-analysis to examine the relationship between the different measures of work experience and job performance.

This study adds to the findings of previous meta-analyses of the relationship between work experience and job performance in a number of ways. First, previous studies have focused on job tenure as the only measure of work experience. Thus, these studies did not address the extent to which the specific measure of work experience used influenced its relationship with job performance. In addition, this study develops a conceptual framework which can be used to organize and guide future research in the area of work experience. Finally, the effects of work experience on performance are examined using both, objective and subjective, measures of job performance.

The Meaning of Work Experience

Philosophers argue that to ask about experience is to ask about the character of mind itself (Haldane, 1926). John Locke, like Aristotle, believed that upon birth, the mind was a blank slate or tabula rasa (Hothersall, 1990). Throughout life, experiences act upon this blank slate to imprint knowledge or wisdom much like a sculptor molds soft clay. These philosophers tended not to distinguish between experience and knowledge. In fact, John Dewey asserted that "what we call knowledge is simply meaning, and meaning itself is a stage in experience..." (in Haldane, 1926, p. 11).

Although philosophers have failed to distinguish between experience and knowledge, there are theoretical and practical reasons for differentiating between these two constructs. Even within the applied psychological literature, some researchers have suggested that experience is the job-relevant knowledge gained over time (Fiedler, 1970; McCall, Lombardo, & Morrison, 1988). However, although these two constructs may be related, they are clearly not the same. For example, attending a lecture describing the workings of an internal combustion engine may increase a person's level of declarative and, to some extent, procedural knowledge. However, procedural knowledge is more likely to increase as a result of hands-on experience repairing an engine.

In addition to affecting different dimensions of knowledge, similar experiences may not always lead to similar increases in knowledge. For example, a surgeon and a first-year medical student are likely to extract different amounts of new knowledge from observing a new surgical procedure being performed (cf., Sternberg & Frensch, 1992). It is clear that one of the goals of research in this area should be to identify the conditions under which experience leads to desired outcomes. However, before a nomological net linking experience with other variables (e.g., knowledge) can be developed, it is important to understand the meaning and measurement of the experience construct.

Experience is generally defined as events which occur in an individual's life that are perceived by the individual. However, life events are clearly not discrete. Life is a fluid stream of

experience events with no common system for delineating when an event ends and the other begins. This fact points to another characteristic of experience. Any attempt to systematically investigate experience must be context-bound. For example, one can investigate childhood experiences with parents to gain insight into the emotional problems of adults. Thus, experience refers to a partition or subset of an individual's life events along some relevant dimension of interest.

Organizational researchers are usually interested in the study of individuals in work settings. Predictors of job performance are usually chosen because of their relevance to the job in question (Klimoski, 1993). In other words, there must be a congruence between predictor and criterion constructs (Binning & Barrett, 1989). Therefore, the most relevant categorization of an individual's life experiences for predicting job performance is work experience. Work experience refers to events which are experienced by an individual which relate to the performance of some job. However, a number of measures can be used to represent an individual's level of work experience (Hofmann, Jacobs, & Gerras, 1992; Rowe, 1988).

The Measurement of Work Experience

A levels perspective can be used to develop a framework for the measurement of work experience. A levels perspective requires a clear definition of constructs and the domain of interest (dimensions of a construct) as well as the level of measurement specificity (Klein, Danserau, and Hall, 1994; Ostroff & Ford, 1989; Rousseau, 1985). A levels perspective also forces the researcher to think conceptually about the individual, team, and organizational issues as well as possible cross-level effects. Within levels, however, there are important issues to address including clearly defining the construct of interest and ensuring congruency between the conceptualization, operationalization, and interpretation of results (Ostroff & Ford, 1989).

Our purpose is to focus on individual level issues of work experience and to expand our understanding so that there can be congruency across conceptualization, operationalization, and interpretation of various work experience measures. A first step is to develop a framework that

specifies the domain of interest and the measures that may be appropriate for each "cell" in the framework. Such a framework outlines the broad dimensions which characterize the various measures of work experience as well as the specific levels of specificity within each dimension.

Recent research has tended to support this multidimensional view of the work experience construct. For example, Ford, et al. (1992) identified three modes of measuring experience that seemed to capture the experiences US Air Force recruits received on the job. These modes included breadth, or the number of tasks performed, activity level, or the number of times these tasks were performed, and task type, or the difficulty/criticality of the tasks performed. Similarly, DuBois and McKee (1994) differentiated between quantity and quality of experience. These authors found that various measures of experience such as job tenure have less than perfect correlations with other measures of experience such as task frequency, recency, or supervisory experience. Finally, Craiger and Coovert (1991) differentiated between prevailing (job and equipment specific) and general (tenure) experience in predicting job knowledge and performance.

Measures of experience can also vary along the level of specificity at which experience is measured (DuBois & McKee, 1994). For example, an individual's level of experience can be linked to specific tasks, jobs, or organizations. The appropriate level of specificity measured should depend, not on the available data, but on the theoretical linkages between experience and outcomes of interest. For example, it is more likely that the number of times a person performs a particular task is more relevant than job tenure for predicting task performance (Sego, Ford, & Teachout, 1995). Conversely, organizational tenure is perhaps more relevant than the time spent on a specific task for predicting organizational commitment.

From the literature cited above, two general dimensions seem to capture the various measures of work experience. These dimensions are referred to as measurement mode and level of specificity. Three measurement modes are specified in the proposed framework. Time based measures are perhaps the most familiar to researchers. These include typical measures such as job and organizational tenure (e.g., months or years in the job). Amount measures refer to numerical counts such as the number of times a task was performed or the number of different jobs held in an

organization. Finally, measures which categorize experience qualitatively (e.g. management, accounting, etc.) are referred to as type measures. Each of these modes can be operationalized at three levels of specificity (task, job, and organizational) forming a 3x3 categorization scheme (see Figure 1).

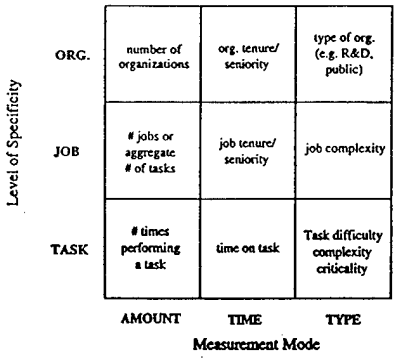

Figure 1: A Conceptual Framework of Work Experience Measures.

The framework in Figure 1 forms nine specific cells describing different measures of work experience. Examples of measures falling within each cell are also illustrated. As the figure suggests, individuals can vary in their level of experience performing specific tasks (Ford et al., 1992). First, they can perform a particular task a given number of times (amount). Second, individuals can vary in the types of tasks that they have performed (type). Some may perform simple, routine tasks whereas others may perform more difficult, complex, and critical tasks. Finally, individuals can vary in the amount of time spent working on a given task (time). It is important to recognize that each measure of task-level experience captures a somewhat unique portion of an individual's overall level of work experience. For example, two people can perform any task the same number of times but differ in the difficulty or criticality of the task performed. Similarly, individuals may spend the same amount of time performing a task but differ in the number of times they perform the task within that time.

It is also possible to measure a person's experience at the job level of specificity. First, individuals can differ in the total number of jobs that they have held (amount). Sometimes task level experience is aggregated to the job level by summing the number of tasks performed by an individual (e.g., Lance, Hedge, & Alley, 1989). This corresponds to the breadth measure described by Ford, et al. (1992). Individuals also can have distinct experiences by performing different types of jobs which vary in terms of prestige, difficulty, criticality, or contribution to

organizational effectiveness (type). Finally, differences in work experience can be represented by the amount of time spent in a particular job, or job tenure (time).

Differences in experience can also exist at the organizational level of specificity. First, individuals can vary in the number of organizations for which they have worked (amount). Second, organizational experience can vary depending on the type of organization in which a person has worked such as manufacturing, research and development, etc. (type). Finally, organizational experience can vary depending on the amount of time spent in a given organization (time).

A literature review of the work experience literature was conducted to examine the usefulness of the proposed framework by applying it to the particular measures of work experience used in these studies. The consequences of measuring experience in different ways was examined in a meta-analysis by using measurement mode and level of specificity as moderators of the experience-performance relationship. Job performance was chosen as the criterion of interest because of the central role it plays in human resource research and practice and the fact that work experience is often used to make inferences about an individual's future level of job performance. Past studies have suggested that the specific measure of job performance used can moderate the validities of various predictors (e.g., Ford, Kraiger, & Schechtman, 1986; Nathan & Alexander, 1988; Schmitt, Gooding, Noe, & Kirsch, 1984). Therefore, the specific measure of job performance used in each study was also examined as a potential moderator of the experience-performance relationship.

Hypothesized Moderators

It was hypothesized that measurement mode and level of specificity would moderate the relationship between work experience and job performance. Specifically, it was expected that amount measures of experience will have the highest correlation with performance since they focus on what a person is actually doing rather than simply how long they have been doing it. As past research suggests, time on the job is an imperfect measure of what an individual actually does on

the job (e.g., Ford, et al., 1992). Type measures of experience are similarly imperfect indicators of actual work experience and are likely to have lower correlations with job performance. Similarly, task level of specificity is likely to be more highly related to job performance than higher levels. Hard criteria may also involve more specific measures of performance while ratings are more distal and global (cf. Nathan & Alexander, 1988). Therefore, it is likely that work experience will correlate more strongly with hard than soft performance criteria.

Method

Identification of Relevant Literature

Several criteria were used to select studies for this review. First, the search was limited to studies examining the relationship between work experience and job performance. Second, the search included studies in the published literature as well as military technical reports. Third, only studies which were empirical in nature were included. Finally, the studies had to report information which lent itself for inclusion into a meta-analysis (e.g., zero-order correlations).

Given these decision rules, a search using Psych-Lit as well as ABI-Inform was conducted. These two databases cover most major journals in the fields of psychology, education, human resource management, and organizational behavior. A manual search of the last two years of key journals in applied psychology and human resource management was also conducted. In addition, a search of the relevant military technical reports was carried out. The search resulted in the identification of 22 studies containing 53 useful statistics (e.g., correlations).[1]

Coding of Studies

Initially, ten studies were coded by three independent coders using the framework developed in Figure 1 and results were discussed to facilitate reliability and consistency in coding. All studies were then coded by two independent coders using the experience dimensions described above. In addition to measurement mode and level of specificity, the type of criteria used was also

coded. These were divided into two categories; hard and soft criteria. Hard criteria represent fairly objective measures of performance such as production units, amount of sales, work samples, or work simulations. Soft criteria were supervisory, peer, and self ratings of job performance. The coders showed almost perfect agreement (> 90%) in coding experience and performance measures.

Meta-Analytic Procedures

Meta-analytic procedures were used to examine the overall effect of work experience on performance, as well as the potential moderators of this relationship (Hunter & Schmidt, 1990; Raju, Burke, Normand, & Langlois, 1991). Meta-analysis is a statistical technique which allows for the aggregation of the results across studies and corrects for various statistical artifacts in order to obtain an estimate of the true relationship between two variables in the population.

For purposes of this meta-analysis, all study statistics reflecting the relationship between experience and performance were converted into correlations (see Hunter & Schmidt, 1990). Correlations are easily manipulated and provide a standardized measure of the strength and direction of a relationship which is easily interpretable. Meta-analytic procedures require that each observed correlation be weighted by the sample size in order to calculate a mean weighted correlation (M_r) across all studies examined. The standard deviation of the observed correlations (SD_r) is then computed to capture the variability in the relationship between work experience and job performance across studies.

The total variation across studies is composed of several key elements. These include, true variation in the population, variation due to sampling error, and variation due to other statistical artifacts such as reliability and range restriction. By accounting for variation due to statistical artifacts, one can obtain a better measure of the true variability around the population correlation. For this study, sampling error and criterion reliability were statistically controlled in order to estimate the population parameters.

The population parameters to be estimated included the mean corrected correlation (M_ρ), the standard deviation of the estimated correlation (SD_ρ), and the standard error of the mean

correlation ($SE_{M_{\hat{\rho}}}$). The estimated mean correlation and standard error can be used to calculate a confidence interval around the mean correlation. If the 95% confidence interval around the mean correlation does not include zero, it can be concluded that a true relationship between work experience and job performance exists in the population (Finkelstein, Burke, & Raju, in press).

In addition to estimating the population correlation, meta-analysis allows one to determine the extent to which the observed relationship between work experience and job performance depends on other factors. If the results show that after accounting for statistical artifacts, a substantial amount of variability in the correlations across studies remains, other factors may be used to help account for this variability. In this study, three classes of moderators were examined. These included measurement mode (amount, type, & time), level of specificity (task, job, and organization) and type of performance measure (soft vs. hard).

In conducting moderator analyses, separate meta-analysis calculations were computed for each subset of studies (e.g. hard and soft criteria). To examine the presence of a moderated relationship, a confidence interval around the estimated population correlation ($M_{\hat{\rho}}$) was constructed for each subset of studies using the standard error of the estimated population correlation ($SE_{M_{\hat{\rho}}}$) (Finkelstein, Burke, & Raju, in press). A lack of overlap between confidence intervals suggests that the overall effect of work experience on performance differed by level of specificity and measurement mode from the conceptual framework as well as the type of performance measure used. In addition, a Z-test was conducted to examine the statistical significance of the difference between each moderator pair using the following formula:

$$Z = \frac{M_{\hat{\rho}_1} - M_{\hat{\rho}_2}}{\sqrt{SE_{M_{\hat{\rho}_1}}{}^2 - SE_{M_{\hat{\rho}_2}}{}^2}}$$

A full test of the proposed framework would also involve the interaction between measurement mode and level of specificity. This type of analysis would test whether distinct measurement modes are differentially related to performance as a function fo the level of

specificity. Unfortunately, the studies examined did not fall into all nine cells in the framework. For example, there were no studies examining the amount of experience at the organizational level of specificity. A future test of this interaction should be conducted as more studies become available.

One assumption that is made when conducting a meta-analysis is that the statistics used in the calculations are statistically independent (Hunter & Schmidt, 1990). A few of the studies in the database contained more than one statistic for each sample. These statistics were combined (averaged) only when they reflected similar study characteristics on the three coded dimensions (measurement mode, level of specificity, and job performance measure). If the statistics reflected different characteristics, they were analyzed separately. Reliability estimates for the average correlations were computed using the Spearman-Brown formula (see Hunter & Schmidt, 1990, page 461). This process reduced the number of analyzable correlations from 53 to 44 with a total sample size of 25,911. However, this process also increased the precision of the estimates of $SD_{\hat{\rho}}$.

Results

Table 1 presents summary information for all studies examined prior to any aggregation of conceptual replications within studies. Specifically, the sample characteristics, experience measures, criterion measures, and observed correlations are presented.

The studies in Table 1 examined the relationship between work experience and job performance for a variety of occupations ranging from skilled laborers (e.g., garment workers,

Table 1

Summary Table of Experience Literature.

Study	N	Sample	Experience Measure	Level	Criterion Measure	r
Borman, et al. (1993)	570	Army Personnel	time in supervisory job	job	supervisor ratings	.14
			time in supervisory job	job	supervisor proficiency	.25
Cobb (1968)	568	air traffic controllers	time since entering duty	job	supervisor ratings	-.05
			time since entering duty	job	peer ratings	-.02
Earley, Lee, & Hanson (1990)	347	various occupations	time in present job	job	supervisor ratings	.10
Giniger, Dispenzieri, & Eisenberg (1983)	212	garmment workers (speed jobs)	number of years in job	job	average hourly piece-rate wage	.47
	455	garmment workers (skill jobs)	number of years in job	job	average hourly piece-rate wage	.46
Gordon & Fitzgibbons (1982)	162	sewing machine operators	tenure with company	org	quarterly efficiency average	.23
			time on job	job	quarterly efficiency average	.15
			interjob similarity	job	quarterly efficiency average	.20

Table 1 (cont'd)

Gould & Hawkins (1978)	132	managerial and clerical public employees	time in company	org	supervisor ratings	.37
Hall & Mansfield (1975)	290	professionals in R&D companies	time in company	org	self-ratings of performance	-.11
	90	professionals in R&D companies	time in company	org	self-ratings of performance	.01
Jacobs, Hofman, & Kriska (1990)	126	firefighters	years since hired	job	supervisor ratings	.22
Katz (1978)	89	public sector employees	time in present job	job	supervisory ratings of overall job performance	-.02
Lance, Hedge, & Alley (1989)	255	Air Force jet engine mechanics	job experience composite	job	walk-through performance test	.10
	255	Air Force jet engine mechanics	job experience composite	job	task proficiency supervisor ratings	.22
	255	Air Force jet engine mechanics	job experience composite	job	task proficiency self-ratings	.22
	255	Air Force jet engine mechanics	job experience composite	job	task proficiency peer ratings	.12
	255	Air Force jet engine mechanics	task experience composite	task	walk-through performance test	.25

Table 1 (cont'd)

Lance, Hedge, & Alley (1989)	255	Air Force jet engine mechanics	task experience composite	task	task proficiency supervisor ratings	.34
	255	Air Force jet engine mechanics	task experience composite	task	task proficiency self-ratings	.57
	255	Air Force jet engine mechanics	task experience composite	task	task proficiency peer ratings	.26
Laxar & Olson (1978)	14	Navy submarine officers	instructors vs. recent graduates	job	errors in performing line-of-sight computer task	.54
Maranto & Rodgers (1984)	191	wage-hour investigators	time with division	org	wages recovered for claimant	.21
			years of previous work experience	job	wages recovered for claimant	.15
McDaniel, Schmidt, & Hunter (1988)	16,058	various occupations	tenure in occupation	job	supervisor ratings	.21[a]
McEnrue (1988)	89	restaurant managers	tenure in current restaurant	job	restaurant profits	.19
			tenure with org.	org.	restaurant profits	.30
Petty (1974)	100	ROTC students	experience in leaderless group discussion (manipulated)	task	peer ratings	.17

Table 1 (cont'd)

Pinder & Schroeder (1987)	354	managers	change in job function	job	time to proficiency self-ratings	.13
			perceived job similarity	job	time to proficiency self-ratings	.21
			number of previous transfers	job	time to proficiency self-ratings	.09
Potter & Fiedler (1981)	130	Coast Guard	months in service	org	supervisor ratings	.18
Rakestraw & Weiss (1981)	174	college students	experience with card sorting task (manipulated)	task	# cards sorted in 5 min.	.25
Schmidt, Hunter & Outerbridge (1986)	368	Armor Crewman	months on the job	job	supervisor ratings	.21
			months on the job	job	work sample	.68
	360	Armor Repairman	months on the job	job	supervisor ratings	.14
			months on the job	job	work sample	.42
	380	Supply Specialist	months on the job	job	supervisor ratings	.13
			months on the job	job	work sample	.44
	366	Cook	months on the job	job	supervisor ratings	.25
			months on the job	job	work sample	.41
Schwab & Heneman (1977)	124	assembly workers	tenure with company	org	average hourly productivity	.42

Table 1 (cont'd)

Spiker, Harper, & Hayes (1983)	70	Army automotive mechanics	self-reported number of starter repairs performed	task	overall profiency (hands on)	.69
			self-reported number of starter repairs performed	task	repair time (hands on)	.69
			self-reported number of starter repairs performed	task	overall accuracy (hands on)	.57
			self-reported number of generator repairs performed	task	overall profiency (hands on)	.73
			self-reported number of generator repairs performed	task	repair time (hands on)	.58
			self-reported number of generator repairs performed	task	overall accuracy (hands on)	.61

[a] This is the overall correlation. Separate correlations for each experience cohort were used in the meta-analysis calculations.

mechanics) to professionals (e.g., managers, clerical). Individuals from public (military, government) and private sector jobs were also sampled in the studies. One study used undergraduate students in a laboratory setting. In terms of criteria, a substantial proportion (52.3%) of the studies used supervisory, self, or peer ratings of performance (soft measures) while others (47.7%) used more objective measures of performance such as work samples (hard measures). Some studies used both types of measures.

Measurement Mode

A examination of Table 1 reveals a wide range of measures of work experience. This variability illustrates the lack of consistency in the literature regarding the work experience construct. Only a few of the studies made any mention of the fact that different measures of experience may be used with perhaps different results (e.g., Borman, et al., 1993; Hofmann, Jacobs, & Gerras, 1992; Lance Hedge & Alley, 1989).

Time . Most studies (79.5%) employed a time-based measure of experience. These include time spent in a particular job, time in the company, or total time spent in a given occupation. These measures are often referred to as tenure. For example, Giniger, Dispenzieri, and Eisenberg (1983) correlated the amount of time spent in a garment worker position with average hourly piece-rate wages, while McEnrue (1988) correlated the amount of time a manager had spent in their restaurant with the restaurant's profits.

Amount. A second group of studies (11.4%) measured work experience as an amount. Specifically, these studies defined work experience as the number of times performing a particular task. Individuals performing a task more times are viewed as having more work experience. For example, Spiker, Harper, and Hayes (1983) correlated the number of times Army automotive mechanics performed starter and generator repairs with their scores on a hands-on proficiency test.

Type. Finally, a few studies (9.1%) categorized an individual's work experience into types. For example, Laxar and Olson (1978) compared the job performance levels of instructors in a Navy training course with those of recent graduates. Instructors were presumed to have more

work experience than recent graduates both in a qualitative and quantitative sense. Pinder and Schroeder (1987) defined experience as the degree of similarity between a person's previous job and their current one. The more similar the previous job is to the current one, the more relevant work experience the person is presumed to bring to the current job.

Level of Specificity

Most of the literature of work experience has focused on the individual as the unit of analysis. The experience of a work group or an organization is seldom examined. However, within an individual, studies have measured work experience at the task, job, or organizational level of specificity.

Task. A few studies (13.6%) measured experience specific to individual tasks. For example, Lance, Hedge, and Alley (1989) created a task experience composite using the number of times Air Force Jet Engine Mechanics performed a series of tasks and incumbent ratings of relative experience on these tasks. In another study, Spiker, Harper, and Hayes (1983) asked Army Automotive Mechanics to report to number of times they had performed engine starter and generator repairs in order to measure task-level experience.

Job. The majority of the studies examined (68.2%) measured work experience an the job level of specificity. For example, Borman, et al. (1993) measured the experience of Army personnel by recording the amount of time spent in a supervisory job. Pinder and Schroeder (1987) measured job-level experience by counting the number of times managers had been transferred. Managers who had been transferred more often were viewed as having more experience.

Organization. A small number of studies (18.2%) examined work experience at the organizational level of specificity. For example, Potter and Fiedler (1981) measured the number of months spent in the Coast Guard to indicate work experience. Schwab and Heneman (1977) measured the time assembly workers have been in an organization as a measure of work experience.

Meta-Analytic Findings

Table 2 presents the results of the meta-analyses conducted on the entire database as well as the results of the moderator analyses. Each is discussed in turn.

The first set of analyses were conducted using all 44 available correlations with a total sample size of 25,911. The mean weighted correlation obtained was .22 (SD_r =.11). The estimated population mean correlation after correcting for sampling error and criterion unreliability was .27 ($SD_{\hat{\rho}}$ =.12). The 95% confidence interval around the mean correlation did not include zero, suggesting that the relationship between experience and performance in the population is positive. Only 12.87% of the variance in the observed correlations was accounted for by sampling error and criterion unreliability, suggesting that other study characteristics may moderate the relationship between experience and performance.

The second set of analyses involved dividing up the studies according to type of criteria used, measurement mode, and level of specificity. The results for criterion type indicate that experience had a stronger relationship with hard ($M_{\hat{\rho}}$ =.39, $SD_{\hat{\rho}}$ =.17) than with soft ($M_{\hat{\rho}}$ =.24, $SD_{\hat{\rho}}$ =.08) performance criteria. Both sets of confidence intervals did not include zero, suggesting a positive relationship between experience and both types of performance measures. The 95% confidence intervals did not overlap suggesting that the strength of the relationship is different for the two criterion measures. Furthermore, the Z-test of the difference between the two population correlations was statistically significant ($Z = 10.71$, $p < .01$). A substantial amount of unexplained variance remained for soft and hard criterion measures (20.34% and 11.41% variance explained, respectively).

Table 2

Meta-Analysis Results.

			Observed Effects		Estimated Population Parameters			
	N	K	M_r	SD_r	$M_{\hat{\rho}}$	$SD_{\hat{\rho}}$	$SE_{M_{\hat{\rho}}}$	95% Confidence Interval for $M_{\hat{\rho}}$
Overall	25,911	44	.22	.11	.27	.12	.01	.26 - .29
Performance Measure								
Soft	21,192	23	.19	.07	.24	.08	.01	.23 - .26
Hard	4,719	21	.35	.16	.39	.17	.01	.36 - .42
Measurement Mode								
Amount	824	5	.36	.14	.43	.17	.03	.36 - .50
Time	24,457	35	.22	.11	.27	.11	.01	.25 - .28
Type	630	4	.19	.06	.21	.00	.05	.13 - .30
Level of Specificity								
Task	924	6	.34	.15	.41	.17	.03	.34 - .47
Job	23,779	30	.22	.10	.27	.12	.01	.26 - .29
Organization	1,208	8	.16	.18	.16	.20	.04	.09 - .23

NOTE: N = sample size; K = number of effects; M_r = mean weighted correlation; SD_r = standard deviation of observed correlations; $M_{\hat{\rho}}$ = mean estimated population correlation; $SD_{\hat{\rho}}$ = standard deviation of estimated correlation; $SE_{M_{\hat{\rho}}}$ = estimated standard error of $M_{\hat{\rho}}$.

The next potential moderator examined was measurement mode. The results show that the strongest relationship between experience and performance occurs when work experience was measured as an amount ($M_{\hat{\rho}}$ =.43, $SD_{\hat{\rho}}$ =.17). This was followed by time ($M_{\hat{\rho}}$ =.27, $SD_{\hat{\rho}}$ =.11) and finally type ($M_{\hat{\rho}}$ =.21, $SD_{\hat{\rho}}$ =.00). The confidence intervals around these three values revealed that they are all positive. In addition, the confidence interval for amount of experience suggested that the relationship was significantly different from that of time and type. In addition, the Z-tests showed significant differences for amount vs. time ($\underline{Z} = 5.00$, $\underline{p} < .01$) and amount vs. type ($\underline{Z} = 3.79$, $\underline{p} < .01$). The difference between time and type was not statistically significant. The amount of variance explained increased only for studies using type of experience (100% variance explained). For the other two subsets, a substantial amount of unexplained variability remained (14.49% and 12.45% explained for amount and time, respectively).

The final potential moderator examined was the level of specificity of the experience measure. The results indicate that the strongest relationship between experience and performance occurred when experience was measured at the task level ($M_{\hat{\rho}}$ =.41, $SD_{\hat{\rho}}$ =.17) when compared to those studies examining this relationship at the job ($M_{\hat{\rho}}$ =.27, $SD_{\hat{\rho}}$ =.12), or organizational level of specificity ($M_{\hat{\rho}}$ =.16, $SD_{\hat{\rho}}$ =.20). The confidence intervals around these estimates indicate that the relationships were all positive. Also, none of the confidence intervals overlapped, suggesting that the differences between the three types of measures were statistically significant. The Z-tests confirmed this finding (task vs. job, $\underline{Z} = 4.38$, $\underline{p} < .01$; task vs. organization, $\underline{Z} = 5.00$, $\underline{p} < .01$; job vs. organization, $\underline{Z} = 2.68$, $\underline{p} < .01$). Statistical artifacts accounted for 16.81%, 12.32%, and 20.45% of the variance in observed correlations for task, job, and organizational measures, respectively.

Discussion

This study was motivated by the importance of the work experience construct for human resource research and practice as well as the lack of clarity regarding the definition and

measurement of the work experience construct in the existing literature. A conceptual framework was developed which specified two dimensions along which work experience measures can vary. These included measurement modes of amount, time and type as well as task, job, and organizational levels of specificity. A literature review and meta-analysis were conducted to examine the usefulness of the conceptual framework.

Results of the literature review revealed that most researchers used a time-based measure of experience (e.g., tenure). A few measured work experience as an amount and still fewer measured the type of work experience. In addition, most studies measured work experience at the job level of specificity. However, a few studies examined work experience at the task and organizational level of specificity. It is clear from this review that individuals are using the same term (e.g., work experience) to refer to very different measures.

The results of the meta-analyses revealed that the relationship between work experience and job performance was positive regardless of the work experience measure used. The relationship was stronger when hard performance measures such as work samples were used as compared to soft performance measures such as supervisory ratings. The meta-analyses results also revealed some variation in the relationship between work experience and job performance as a function of measurement mode. The strongest relationship occurred between amount of experience and performance. Time and type measures showed the weakest relationships. Finally, variability in the relationship between experience and performance as a function of level of specificity was found. Task level experience had the strongest relationship with performance whereas organizational level showed the weakest.

These results are consistent with expectations and suggest that various measures of work experience capture different aspects of job-relevant experience. Amount and task-level measures are perhaps better measures of what individuals actually do on the job. Time based measures are likely to be poor indicators of actual experiences. Similarly, task level measures may capture more specific experiences than do job or organizational measures.

The stronger correlation found for hard measures of performance is consistent with past findings examining this potential moderator (e.g., Blakley, Quiñones, Crawford, & Jago, 1994; Nathan & Alexander, 1988). One possible explanation for our specific findings is provided by researchers examining "experience attributions" (Hofmann, Jacobs, & Baratta, 1993; Martin & Klimoski, 1990). These researchers suggest that individuals may rate an employee's performance relative to their level of job experience. A poorly performing newcomer may be rated the same as an average performing veteran. Thus, subjective ratings may attenuate actual performance level differences which are captured by more objective "hard" performance criteria. This attenuation could explain the stronger correlations found between work experience and hard measures of performance.[2]

The results of this study also suggest that researchers must recognize the wide range of measures that are being called work experience. A common language must be developed if research findings are to be used to make conclusions about the effects of work experience. Further theoretical work is needed which outlines the various facets of work experience. For example, DuBois and McKee (1994) argue that experience is not equal to practice. Contextual factors such as supervision, feedback, and ability to work in groups can have an impact on the "quality" of a person's experience.

Specifically, DuBois and McKee (1994) as well as McCall, Lombardo, and Morrison (1988) argue that some experiences pack more developmental punch than others. For example, starting a business from scratch, or turning an ailing business around, are events that managers regard as important learning experiences. This view of experience, however, begs the question of whether one is talking about experience or knowledge. In this case, work experience is the event (e.g. starting a business) and knowledge is the outcome. It is possible that two individuals can be sent to start separate businesses and thus have equal experiences. However, the outcomes can be dramatically different. It is possible that what is commonly referred to as "quality" in this situation is the outcome of experience (e.g., successful business startup) or perhaps the contextual factors which lead to a transfer from experience to outcome. Further theoretical and empirical work is

needed which explores the "quality" of experience construct. For example, Sternberg and Frensch (1992) suggest that expertise may be nothing more than an attribution we make about someone's level of knowledge. It is possible that "quality" of experience is also an attribution regarding an experience event based on the outcome of that experience.

A potential limitation of the current study is the fact that the comparisons made regarding the various experience measures represent between-subject comparisons. Future research should examine the relationship between various measures of work experience and job performance within an individual. For example, Ford, Sego, and Teachout (1991) found a positive relationship between the number of times performing a task and a hands-on measure of task experience after accounting for differences in job tenure. Similar results were found by Quiñones and Ford (1993) as well as DuBois and McKee (1994). Thus, the results presented here may not necessarily capture the unique effects that various measures of work experience can have on job performance (see also Sego, Ford, & Teachout, 1995).

In addition, the studies examined did not represent the entire range of measures in the conceptual framework. Most studies measured experience using a time-based measure at the job level of specificity. There were no studies, for example, which measured experience using amount at the job or organizational level. More research is needed which examines all possible measures of work experience and their relationship with various outcomes of interest.

Future research could also examine the relationship between various measures of work experience and other organizational outcomes, in addition to job performance. For example, organizational tenure is more likely to be related to organizational commitment than is task level experience. Conversely, task level experience is more likely to be related to self-efficacy than is organizational level experience. Experience is also relevant for the study of expertise and the development of expert mental models (Cooke & Schvaneveldt, 1988; Howell & Cooke, 1989; Sternberg & Frensch, 1992). It is important to know whether expertise develops as a result of time or as a function of the number of times a particular task is performed.

The findings regarding level of specificity suggest potential avenues for future research. It is possible that the extent to which the level of specificity leads to higher or lower relationships depends on the level of specificity of the criterion variable. Recent work on the performance construct suggests a multidimensional and multilevel perspective regarding criterion measures (e.g., Borman, 1991; Campbell, McCloy, Oppler, & Sager, 1993). Future theoretical work could speculate on the relationships between various measures of experience and performance measures developed from a construct perspective (cf., Vance et al., 1989).

A related issue involves the distinction between level of specificity and level of analysis. In this study, experience was measured at the individual level of analysis. It would be interesting to examine the measurement and outcomes of experience differences between work groups and organizations. Research on transactive memory suggests that providing experiences to a group helps develop group-level memory systems which aid in group performance (Liang, Moreland, & Argote, 1995). This suggests that the effects of experience may be qualitatively different at different levels of analysis.

In addition, the role of work experience in traditional human resource functions such as personnel selection, training, and career development should be examined. For example, the tradeoff between aptitude and experience in determining job performance needs to be addressed (Alley & Teachout, in press; Schmidt, Hunter, Outerbridge, & Goff, 1988). Training research could examine the types of experiences needed in order to maintain gains made during training (see Ford, et al, 1992). Finally, career development studies could examine the experiences needed in order to progress from one type of job to another (cf., Campion, Cheraskin, & Stevens, 1994).

In summary, our review and meta-analysis suggest that work experience is a complex and multidimensional construct. Researchers must pay closer attention to their definition and operationalization of this construct in order to aid in the interpretation of results. We hope that the proposed framework is only the first step towards a greater understanding of this very important construct.

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Footnotes

[1] Since McDaniel, Schmidt, & Hunter (1988) found that level of experience moderated the experience-performance relationship, separate correlations for each of five experience cohorts weighted by sample size were used in the meta-analysis.

[2] We thank an anonymous reviewer for suggesting this explanation.