

A review and critique of research on training and organizational-level outcomes

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Abstract

This paper aims to advance understanding of the effects of training on organizational-level outcomes by reviewing the results of previous studies that have investigated the relationship between training and human resource, performance, and financial outcomes. The results of meta-analysis from 67 studies suggest that training is positively related to human resource outcomes and organizational performance but is only very weakly related to financial outcomes. The relationship between training and firm performance may be mediated by employee attitudes and human capital. Furthermore, training appears to be more strongly related to organizational outcomes when it is matched with key contextual factors such as organization capital intensity and business strategy, in support of the contingency perspective. Further, training is related independently to organizational outcomes in support of the universalistic perspective of strategic human resource management rather than a configurational perspective. The paper concludes with a critique of previous studies and directions for future research. Particular emphasis is given to the need for future research to integrate individual-level (micro) and organizational-level (macro) training research, models, and theory.

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1. Introduction

The knowledge and skills of an organization's workforce have become increasingly important to its performance, competitiveness, and innovation (Lawler, Mohrman, & Ledford, 1998; Martocchio & Baldwin, 1997). Workplace learning and continuous improvement are now considered essential for an organization to remain competitive (Salas & Cannon-Bowers, 2001). Thus, it is not surprising that employee training is a multi-billion dollar industry worldwide (Haccoun & Saks, 1998). In 2006, organizations in the United States spent a total of \$55.8 billion on training (Industry Report, 2006). According to Kraiger (2003), successful organizations are thought to invest more in training and

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development than other organizations. The substantial outlay that organizations spend each year on formal training and development programs is made with the expectation that their training investments will lead to improvements in organizational performance or results (Dolezalek, 2005; Salas & Cannon-Bowers, 2001). Although training is only one way for employee learning to occur, the investment made in training requires an analysis of the evidence to examine if, indeed, training pays off in organizational effectiveness.

However, training is often criticized for being faddish, too expensive, not transferring to the job, and not improving the bottom line (Caudron, 2002; Kraiger, McLinden, & Casper, 2004; Salas, Cannon-Bowers, Rhodenizer, & Bowers, 1999; Wright & Geroy, 2001). Training is often viewed as a cost center to be controlled or downsized during lean times (Kraiger, 2003). Indeed, training programs are implemented for reasons other than improving performance such as legal compliance, rewarding and retaining employees, or because of training fads. There is skepticism about the link between training and results criteria. For example, Alliger, Tannenbaum, Bennett, Traver, and Shotland (1997, p.346) claimed that “most training efforts are incapable of directly affecting results level criteria”. Wright and Geroy (2001, p.586) referred to the belief that training leads to improved organizational performance as a myth—“that equates training with ‘goodness’”.

Research on the effects of training on results criteria remains sparse, especially at the organizational level of analysis. In fact, so few studies have included results criteria that a meta-analysis of the relations among Kirkpatrick's (1987) four levels of training criteria was unable to include results (Alliger et al., 1997). Furthermore, most organizations still only evaluate training programs using reaction criteria, and very few measure the impact of training on results (Alliger et al., 1997; Kraiger, 2003; Kraiger et al., 2004). Thus, when it comes to the effects of training on organizational outcomes or results criteria, there has not been the same degree of progress as there has been on the science and practice of training at the individual level of analysis (Kraiger, 2003; Salas & Cannon-Bowers, 2001).

Training is defined as the systematic acquisition and development of the knowledge, skills, and attitudes required by employees to adequately perform a task or job or to improve performance in the job environment (Goldstein, 1980; Latham, 1988). Training should impart new knowledge and skills if the training is relevant, based on employee and organizational needs, and effectively designed and delivered (Salas et al., 1999). When training does result in improvements in relevant knowledge and the acquisition of relevant skills, employee job performance should improve, provided that the skills learned in training transfer to the job (Baldwin & Ford, 1988; Salas et al., 1999). Improvement in job performance should be reflected in organizational outcomes or results criteria such as productivity, quality, and service, if the job is strategically aligned to the organization's needs.

Yet, as noted by Alliger et al. (1997), results criteria “are at once most distal from training and often perceived as most fundamental to judging training success” (p.346). Though the effects of training will be most felt on individuals' learning and behavior, scholars have called for the effects of training to be evaluated not just on individual and group outcomes but also on organizational outcomes (Haccoun & Saks, 1998; Ramlall, 2003).

Although there is increasing concern in organizations that training investments be justified in terms of improved organizational performance (Salas & Cannon-Bowers, 2001), it is difficult to find strong evidence of this in the human resource literature. This is because most models and research have focused primarily, if not exclusively, on the individual-level of analysis (Kozlowski, Brown, Weissbein, Cannon-Bowers, & Salas, 2000). The main objective of this paper is to advance our understanding of the effects of training on organizational-level outcomes (results criteria in Kirkpatrick's, 1987, model), as a first step in dealing with the tension between the need for training and doubts about its benefit to organizations, and as a compliment to the more developed literature on the effects of training on transfer and individual behavior and performance (Salas & Cannon-Bowers, 2001).

The paper is organized in five sections. First, the paper describes theoretical models that explain the relationship between training and organizational-level outcomes. Second, the paper describes three perspectives of strategic human resource management (SHRM) and their implications for training. Third, we briefly describe how prior research has measured training and outcome variables. Fourth, we provide the first review of research on training and organizational-level outcomes. Fifth, we critique research on training and organizational-level outcomes and discuss future research directions, noting theoretical and methodological issues that require the greatest attention.

2. Theoretical models of the relationship between training and organizational-level outcomes

Although there is a strong belief that training is related to organizational-level outcomes (Alliger et al., 1997; Kozlowski et al., 2000), the theoretical rationale for this relationship has seldom been the focus of training research. As

noted by Kozlowski et al. (2000), most models of training end with the transfer of individual-level outcomes to the training context and there is little theoretical development or research on how individual-level training outcomes result in organizational-level outcomes. Thus, Kozlowski et al. (2000) concluded that there is a levels gap in the training literature in which, although a goal of training is to enhance organizational effectiveness, the models, methods, and tools of training focus on the individual level.

The literature on strategic human resource management (SHRM) provides a number of models to explain how training might lead to organizational outcomes. For example, Wright and McMahan (1992) provide a conceptual framework that incorporates six theoretical models for the study of SHRM. According to their framework and the theoretical models, HRM practices influence the HR capital pool and HR behaviors; HR behaviors then lead to firm-level outcomes.

Of the six theoretical models described in their framework, three of them are relevant for understanding training and organizational-level relationships. First, according to the *resource-based view of the firm*, an organization's resources can be a source of competitive advantage when it possesses resources that add positive value to the firm, are unique, imperfectly imitable, and cannot be substituted with another resource by competitors. Accordingly, human capital is considered to be a resource that can provide a competitive advantage to the extent that HR practices produce skilled employees who provide value to the firm and have unique inimitable skills. Applying the resource-based view to training suggests that training can be viewed as an investment in human capital that provides employees with unique knowledge, skills and abilities that add value to the firm and enable the performance of activities required to achieve organizational goals, thus resulting in positive organizational-level outcomes (Ostroff & Bowen, 2000).

The second theoretical model is the *behavioral perspective* which focuses on employee role behavior as a mediator between strategy and firm performance. Accordingly, human resource practices should elicit and reinforce the behaviors required by the organization's strategy. Along these lines, it is necessary to identify the HR practices that will be most effective for eliciting desired role behaviors. The desired role behaviors should then lead to positive organizational outcomes. Applying the behavioral perspective to training suggests that training will result in positive organizational outcomes to the extent that it results in employee behaviors that are required by the organization's strategy.

The third theoretical framework is represented by a set of models, described as *cybernetic systems models* or input–throughput–output models (Wright & McMahan, 1992). Open system models portray organizations as transforming inputs from the environment into outputs. Wright and McMahan (1992) present a cybernetic open systems model of HR in which inputs consist of employees' knowledge, skills and abilities (KSAs); the throughput is employee behaviors; and output includes productivity, satisfaction, and turnover. Included under the cybernetic approach is an open systems model of the HR system in which employee competencies (inputs) lead to behaviors (throughputs) which then lead to affective and performance outcomes (outputs). Thus, when applied to training, cybernetic models suggest that training leads to organizational outcomes to the extent that it results in competencies (i.e., knowledge, skills, and abilities) that are necessary to perform the behaviors that will impact organizational outcomes.

Kozlowski et al. (2000) provided a theoretical framework to develop a multilevel model of training effectiveness to bridge the micro–macro gap in the training literature. Kozlowski et al. (2000, p.199) proposed that “Training effectiveness involves the linkage between micro training outcomes and macro objectives at higher organizational levels”. They focused on training transfer “because it is the primary leverage point by which training can influence organizational effectiveness” (p.159) and present a theoretical framework to guide research on vertical transfer (i.e., upward transfer across different levels of the organizational system). Kozlowski et al. (2000) distinguished between two types of vertical transfer processes: composition and compilation. With *composition*, individual contributions are additive and compensatory because they involve the same content (e.g., as in a typing pool). The averaged combination of individual-level KSAs, behavior, and performance will lead to higher-level outcomes. With *compilation*, individual contributions are conjunctive and individuals contribute different or diverse content (e.g., as in a surgical team or a flight crew). Thus, different skills and behaviors need to combine across positions in order for vertical transfer to occur. Regardless of the combinatorial rules, it is individual KSAs, behaviors, and performance that are imparted through training and are the precursor of vertical transfer. Training leads to organizational-level outcomes to the extent that it results in the acquisition of KSAs, behaviors, and performance that are necessary to achieve desired organizational outcomes.

In summary, the theories reviewed in this section suggest that the effect of training on organizational-level outcomes is mediated through direct effects of training on employee attitudes, behaviors, and KSAs. As Ostroff and Bowen

(2000, p.217) theorized, an HR system is a complex set of practices designed to influence employees' collective satisfaction, commitment, motivation, behavior and skills; these attributes are thought to be the mediating mechanism that links HR practices and firm performance.

Therefore, based on the theories that link HRM practices to organizational outcomes, we propose a theoretical framework shown in Fig. 1 that links training to organizational outcomes. Training has a direct effect on HR outcomes and an indirect effect on organizational performance that is mediated through HR outcomes. We have used [Ostroff and Bowen's \(2000\)](#) classification scheme of employee attributes to represent HR outcomes as it encompasses all of the variables in the various models: attitudes (e.g., collective employee satisfaction) and motivation; behaviors (e.g., performance-related), and human capital (e.g., workforce knowledge, skills and abilities). According to [Ostroff and Bowen \(2000\)](#), employees' collective attitudes, behaviors, and human capital should influence organizational performance. In turn, organizational performance should lead to positive financial outcomes for the organization ([Becker & Huselid, 1998](#); [Dyer & Reeves, 1995](#)), mediating the relationship between human resource outcomes and financial performance.

3. SHRM perspectives and implications for training

In the previous section, we described several theories to explain how training is related to organizational-level outcomes. Most of the theories imply a direct linear relationship between training and organizational outcomes. However, theories of SHRM (e.g., resource based theory, behavioral theory) imply that other types of relationships also need to be considered in addition to the basic model in Fig. 1. The literature on SHRM provides alternative perspectives of the relationship between HR practices and organization-level outcomes that are generally referred to as the universalistic, contingency, and configurational perspectives ([Delery & Doty, 1996](#); [Ostroff & Bowen, 2000](#)). These perspectives can also explain different types of relationships between training and organizational-level outcomes.

The most basic perspective is the universalistic perspective. According to the universalistic perspective, some HR practices such as formal training are work practices that are believed to be linked to organizational effectiveness for all organizations that use them ([Delery & Doty, 1996](#); [Ostroff & Bowen, 2000](#)). The basic premise of the universalistic perspective is that greater use of particular HR practices will result in better organizational performance. Thus, according to the universalistic perspective, organizations that provide more extensive training will be more effective. This is in effect the primary perspective taken in most studies on training and organizational-level outcomes, in which training is predicted to have a positive relationship with organizational outcomes. The model shown in Fig. 1 corresponds to this perspective.

A second perspective is known as the contingency perspective. The general premise of the contingency perspective is that the relationship between a specific HR practice and organizational performance is contingent on key contextual factors, most notably an organization's strategy ([Delery & Doty, 1996](#)). Thus, organizations adopting particular strategies require certain HR practices that will differ from those required by organizations with different strategies. The contingency perspective is more complex than the universalistic perspective because it implies interactions between HR practices and organizational factors. Organizations with greater congruence between their HR practices and their strategies, or other relevant contextual factors, should have superior performance ([Delery & Doty, 1996](#)). When applied to training, the contingency perspective suggests that extensive formal training will be most effective when used in combination with certain organizational strategies (e.g., [Schuler, 1989](#)).

A third perspective is known as the configurational perspective. The configurational perspective suggests that there are ideal types or configurations of HR practices that form HR systems that lead to superior performance ([Ostroff & Bowen, 2000](#)). In high-performance systems, HR practices need to be complementary and interdependent, working together to develop valuable, unique human capacities to increase organizational effectiveness ([Barney & Wright, 1998](#)). When

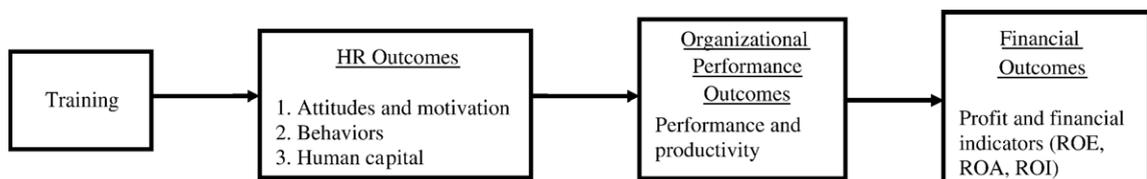


Fig. 1. Theoretical model linking training to organizational-level outcomes.

applied to training, the configurational perspective suggests that training will enhance organizational effectiveness when it is used in conjunction with other, complementary HR practices than when used independently. Thus, when firms invest in training, training must be consistent with other HR practices. HR practices consistent with training include careful screening of applicants for potential and trainability, practices to decrease turnover, use of promotion from within and internal labor markets, use of performance-contingent incentive systems, defining jobs broadly, and providing opportunities for employee participation (Baron & Kreps, 1999; Lepak & Snell, 1999).

In summary, the SHRM literature suggests that the nature of the relationship between training and organizational-level outcomes might be universalistic as suggested in Fig. 1, such that HR outcomes mediate the relationship between training and organizational performance; and/or it might be moderated by organizational factors such as firm strategy (contingency perspective); and/or it might be moderated by other congruent HR practices (configurational perspective).

4. Research on training and organizational-level outcomes

Our review of the literature on training and organizational-level outcomes unearthed 67 studies that have been published in many different journals across a number of disciplines. As a result, there are a number of challenges in reviewing the existing research on training and organizational level outcomes. There is a lack of consistency in how the studies are conducted, how key variables are measured, and how data are analyzed. There are a range of training and outcome variables used. We briefly describe the training and outcome variables that have been measured in previous studies.

4.1. Training variables

Training has been conceptualized and measured in four main ways. In general, the measurement of training has comprised absolute measures (e.g., amount of training employees receive), proportional measures (e.g., percent of workers trained), content measures (e.g., type of training provided), and emphasis measures (e.g., perceived importance of training to the organization). Within the categories, measurement of training has varied. For example, absolute measures of training have been operationalized as total hours or days of training, total dollar amount spent on training, number of workers trained, or the presence or absence of training as a categorical variable. In addition, the number of training variables included in a study also varies. Many studies use a single item to measure training, while others use multiple training measures across different categories. Training items also range from single-item, categorical variables to multi-item scales with reliability measures. As a result, in some studies the training predictor might be a single-item variable, while in others there might be multiple training variables used collectively to predict an outcome.

4.2. Outcome variables

Research on training and organizational-level outcomes also varies as a function of the outcome variables. We can categorize the variety of outcome variables by using Dyer and Reeves' (1995) four-category definition of organizational effectiveness for evaluating effects of HR practices. They break down effectiveness outcomes into: (a) HR outcomes (low absenteeism and turnover, motivation, high job performance); (b) organizational performance outcomes (productivity/output, quality, service); (c) financial or accounting outcomes (profit, return on invested capital [ROI], return on assets [ROA]) and (d) if they are publicly listed companies, stock market outcomes (shareholder returns, stock value). Studies in this review used all types of these variables except for stock market outcomes which are rarely measured and are the most distal theoretically from training. The content of some of the categories was expanded to incorporate other indicators. Learning (e.g., skill acquisition, employee attitudes) was included as a human resource outcome, and internal businesses operations (e.g., quality service, rework, cycle time) and customer outcomes (e.g., on-time delivery, customer satisfaction) were included as organizational performance outcomes (Kaplan & Norton, 1993). HR, performance, and financial outcomes are results criteria in Kirkpatrick's (1987) model.

5. Results

In this section, we review the results of 67 studies (a total of 65 separate samples) that assessed the relationship between training and three categories of organization-level outcomes: HR outcomes, performance outcomes, and financial outcomes. We focused on published research. Studies were obtained from electronic (PsycINFO, Sociological Abstracts,

Table 1
Studies of the relationship between training and organizational-level human resources, performance, and financial outcomes

Study	N	RR	Longitudinal	HR outcomes	Performance outcomes	Financial outcomes
Ahmad and Schroeder (2003)	107	60	No	<ul style="list-style-type: none"> ● Commitment (4 items, α .89), r = .52**, .39**varies by training type 	<ul style="list-style-type: none"> ● Perceived operational performance, (4 items, α .71) r = .37**, .39**varies by training type 	
Aragón-Sánchez et al. (2003)	457	9	No	<ul style="list-style-type: none"> ● HR indicators (4 items, α .73), mixed results ● Involvement (5 items, α .86), mixed results 	<ul style="list-style-type: none"> ● Sales, mixed results ● Quality (5 items, α .73), mixed results 	<ul style="list-style-type: none"> ● Profitability, mixed results
^a Audea, Teo and Crawford (2005)	128	34	No		<ul style="list-style-type: none"> ● Perceived organization performance (4 items, α .74), r = .35** 	
Ballot et al. (2001)	290	Archival data	Panel data		<ul style="list-style-type: none"> ● Labor productivity (value added per worker), + 	
Ballot et al. (2006)	350	Archival data	Panel data		<ul style="list-style-type: none"> ● Labor productivity (value added per worker), + 	
^a Barling, Weber, and Kelloway (1996)	20	N/A	Pre-post test	<ul style="list-style-type: none"> ● Organizational commitment, + 	<ul style="list-style-type: none"> ● Credit card sales, r = .30 n.s. ● Personal loan sales, r = .40* 	
^a Barrett and O'Connell (2001)	215	34 Archival data	Two wave test		<ul style="list-style-type: none"> ● Productivity growth (Δ in output/employment 1993–1995), r = .14** 	
Bartel (1994)	155	Archival data	Yes		<ul style="list-style-type: none"> ● Labor productivity, n.s. ● Productivity gains: 1983–1986, + ● Net sales per employee, + (comparison) 	<ul style="list-style-type: none"> ● Change in market-to-book ratio, 1995–1997, + (comparison) ● Annualized gross profits per employee, + (comparison)
Bassi and McMurrer (1998)	40	Convenience sample	No			
Bassi and Van Buren (1998)	540	4	No	<ul style="list-style-type: none"> ● Performance and increase in performance on satisfaction, +; retention, + 	<ul style="list-style-type: none"> ● Subjective overall performance, + (comparison) ● Performance and increase in performance on sales +, quality+, customer satisfaction+ ● Injury claims (total number and costs), n.s. 	
Bell and Grushecky (2006)	460	Archival data	Yes			
Bernthal and Wellins (2006)	127	Convenience sample	No			<ul style="list-style-type: none"> ● Operating cash flow/net sales, + (comparison) ● Operating cash flow/total assets, + (comparison) ● Market to book ratio, + (comparison) ● Profit margin, + (comparison) ● ROA, + (comparison) ● ROE, + (comparison) ● Profitability, r = -.18**
^a Birley and Westhead (1990)	249	Archival data	No		<ul style="list-style-type: none"> ● Sales, r = .27** 	
Black and Lynch (1996)	638	66	No		<ul style="list-style-type: none"> ● (Log) sales, mixed results 	

Black and Lynch (2001)	1346	64		Panel data		<ul style="list-style-type: none"> • (Log) sales, mixed results, mostly n.s. 	
Boon and van der Eijken (1998)	173	Not given		Panel data		<ul style="list-style-type: none"> • Value added per employee, + • Gross output, n.s. 	
Bracker and Cohen (1992)	73	45		Yes		<ul style="list-style-type: none"> • Sales growth, n.s. 	<ul style="list-style-type: none"> • Income growth, n.s. • Growth in firm present value, n.s.
Cappelli and Neumark (2001)	1304	72		Panel data		<ul style="list-style-type: none"> • Labor efficiency, mixed results • (Log) sales per worker, n.s. 	
Cho, Woods, Jang and Erdem (2006)	78	36		No	<ul style="list-style-type: none"> • Turnover, n.s. 	<ul style="list-style-type: none"> • (Log) labor productivity, n.s. 	<ul style="list-style-type: none"> • ROA, n.s.
D'Arcimoles (1997)	61	Archival data		Panel data		<ul style="list-style-type: none"> • Productivity, + 	<ul style="list-style-type: none"> • Return on capital employed, +
^a Delaney and Huselid (1996)	590	65		No		<ul style="list-style-type: none"> • Perceived organizational performance (7 items, α .85), r = .06* 	<ul style="list-style-type: none"> • Perceived market performance (4 items, α .86), r = .19**
^a Delery and Doty (1996)	114	11		No			<ul style="list-style-type: none"> • ROA, n.s.
^a Deng, Menguc, and Benson (2003)	97	54		No		<ul style="list-style-type: none"> • Export intensity (% export sales to total enterprise sales), r = .17* • Export growth (avg. export sales growth over three yrs.), r = -.21* 	<ul style="list-style-type: none"> • ROE, n.s.
^a Ely (2004)	486	[100]		No		<ul style="list-style-type: none"> • New sales revenue, r = .16* • Sales productivity, r = .21* • Customer satisfaction, r = .00 n.s. • Customer referrals, r = -.07 n.s. • Branch performance, r = .04 n.s. • Performance (productivity, customer satisfaction, quality and speed), r = .27** 	
^a Faems, Sels, De Winne, and Maes (2005)	416	28		No	<ul style="list-style-type: none"> • Voluntary turnover, r = .03 n.s. 	<ul style="list-style-type: none"> • Productivity (value added per member of staff), r = .15** 	<ul style="list-style-type: none"> • Liquidity, r = -.03 n.s. • Solvency, r = -.02 n.s. • Net profitability, r = .10 n.s.
^a Fey and Björkman (2001)	101	28		No		<ul style="list-style-type: none"> • Perceived performance, r = .44** (non-managerial); r = .48** (managerial) 	
^a Fey, Björkman, and Pavlovskaya (2000)	101	28		No	<ul style="list-style-type: none"> • General HR outcomes, r = .23* to .51** (varies by training type) 	<ul style="list-style-type: none"> • Subjective overall firm performance, r = .22* to .26** (varies by training type) 	
Fraser, Storey, Frankish, and Roberts (2002)	570	Archival data		Yes		<ul style="list-style-type: none"> • Sales growth, + (comparison) 	
García (2005)	78	19		No	<ul style="list-style-type: none"> • Perceived employee satisfaction (4 items, α .79), + 	<ul style="list-style-type: none"> • Sales per employee, mixed results • Perceived client satisfaction (3 items, α .70), + 	<ul style="list-style-type: none"> • Perceived owner/shareholder satisfaction (4 items, α .71), +
^a Gelade and Ivery (2003)	137	49		No	<ul style="list-style-type: none"> • Retention, r = .34** 	<ul style="list-style-type: none"> • Customer satisfaction, r = .37** • Clerical accuracy, r = .18* • Sales (%target met), r = .19* 	
^a Ghebregiorgis and Karsten (2007)	82	42		No	<ul style="list-style-type: none"> • Grievances, r = .05 n.s. • Voluntary turnover, r = .25* • Absenteeism, r = -.01 n.s. 	<ul style="list-style-type: none"> • (Log) sales per employee, r = -.01 n.s. 	

(continued on next page)

Table 1 (continued)

Study	N	RR	Longitudinal	HR outcomes	Performance outcomes	Financial outcomes
^a Guerrero and Barraud-Didier (2004)	180	12	Yes	● Perceived employee attendance, $r = .11^\dagger$	● Perceived productivity, $r = -.02$. ● Perceived product and services quality, $r = .10^\dagger$	● Objective profitability, $r = -.04$ n.s.; 12 months later, $r = -.04$ n.s. ● Perceived market performance (4 items, $\alpha .77$), $r = .53^{**}$
^a Harel and Tzafrir (1999)	76	35	No			
^a Hatch and Dyer (2004)	25	[100]	Panel data		● Defect density, $r = -.03$, n.s. to $.40^{**}$ (vary by training type) ● Scrap rate (lagged over time),-	
Holzer, Block, Cheatham, and Knott (1993)	157	32	Panel data			
Horgan and Mühlau (2006)	392	5	No		● Perceived performance (3 scores, work performance, cooperation, discipline), n.s. ● Perceived organizational performance (8 items), + (comparison)	
Huang (2000)	315	36	No		● Production line uptime, +	
Ichniowski, Shaq, and Prensushi (1997)	36	60	Yes			
^a Johnson (1996)	57	[100] 41 (customers)	No		● Overall customer satisfaction (48 items, $\alpha .97$), $r = .44^{**}$	
^a Kalleberg and Moody (1994)	688	Archival data	No	● Perceived HR attraction and retention performance (2 items), $r = .15^{**}$ ● Perceived employee relations performance (2 items), $r = .10^{**}$ ● Perceived employee skills, attitudes and behaviors, $r = .79^{**}$	● Perceived product performance (2 items), $r = .18^{**}$ ● Perceived customer satisfaction (1 item), $r = -.01$ n.s.	● Perceived market performance (4 items), $r = .22^{**}$
^a Katou and Budhwar (2006)	178	30	No	● Perceived employee satisfaction, $r = .63^{**}$	● Perceived organizational performance, $r = .74^{**}$	
^a Katou and Budhwar (2007)	178	30	No		● Perceived effectiveness, $r = .56^{**}$ ● Perceived efficiency, $r = .57^{**}$ ● Perceived innovation, $r = .53^{**}$ ● Perceived quality, $r = .46^{**}$	
^a Khatri (2000)	194	24	No		● Sales growth, $r = .08$ n.s. (for training extensiveness) and $r = .02$ n.s. (for training effectiveness) ● Perceived performance (3 items, $\alpha .74$), $r = .18^{**}$ (for training extensiveness) and $r = .14^*$ (for training effectiveness)	● Profit margin, $r = .17^{**}$ (for training extensiveness) and $r = .14^*$ (for training effectiveness)
^a Kintana, Alonso, and Olaverri (2006)	956	17	No		● Perceived productivity improvement (5 items, $\alpha .86$), $.04$ n.s.	
Koch and McGrath (1996)	319	7	No		● Sales per employee (labor productivity), n.s.	
^a Lawler et al. (1998)	491	26	No	● Satisfaction and quality of working life, $r = .13^*$ to $.28^{**}$	● Performance (productivity, customer satisfaction, quality and speed),	● Profitability and competitiveness, $r = .16^*$ to $.33^{**}$, vary by training

					$r = .13^*$ to $.39^{**}$, vary by training type, some results n.s.	type, some results n.s.
^a Lui, Lau, and Ngo (2004)	248	12	No		● Perceived firm performance (3 items, $\alpha .76$), $r = .16^*$	
Lyau and Pucel (1995)	131	55	No		● Value added per worker, + ● Sales per employee (labor productivity), n.s.	
^a Mabey and Ramirez (2005)	179	No report	No		● Productivity (operating revenue per employee; cost of employee), $r = .05$ n.s. to $.19^*$, varies by training type	
^a Martell and Carroll (1995)	115	26	No		● Perceived business unit performance (12 items), $r = .15\ddagger$, n.s.	
Meschi and Metais (1998)	102	44	No			● Return on investment, n.s. (group comparison)
Miron and McClelland (1979)	124	N/A	Pre–post		● Increase in sales, + (pre–post measure)	● Increase in profitability, + (pre–post measure)
Murray and Raffaele (1997)	6	N/A	Yes		● % good pieces, + (pre–post measure)	
Newkirk-Moore, and Bracker (1998)	152	49	No		● Firing quality, + (pre vs post test)	● ROA; ROE; overhead; spread, mixed results
Ng and Siu (2004)	485	62	No		● (Log) sales, mixed results	
^a Ngo, Turban, Lau, and Lui (1998)	253	20	No	● Perceived employee satisfaction, $r = .32^{**}$	● Perceived competitive sales performance, $r = .21^{**}$	● Perceived competitive net profit, $r = .31^{**}$
				● Perceived employee retention, $r = .16^*$	● Perceived competitive new product development, $r = .35^{**}$	
^a Paul and Anantharaman (2003)	34	76	No	● Perceived employee retention, $r = .25^{**}$	● Perceived productivity, $r = .43^{**}$	● Perceived financial performance (3 items, growth in sales, net profit, and ROI), $r = .20^{**}$
				● Competence, $.58^{**}$, commitment, $.43^{**}$	● Perceived quality, $r = .29^{**}$	
^a Russell, Terborg, and Powers (1985)	62	Archival data	No		● Perceived speed of delivery, $r = .12^{**}$	
					● Perceived operating cost, $r = .22^{**}$	
^a Shaw, Delery, Jenkins, and Gupta (1998)	227	36	No	● Turnover: voluntary $r = -.01$ n.s.; involuntary, $r = .19^*$	● Sales volume/employee, $r = .39^*$ (% trained); $r = .08$ n.s. (training emphasis)	
					● Store image (6 items, $\alpha .87$), $r = .46^*$ (% trained); $r = .47^*$ (training emphasis)	● .47*
^a Storey (2002)	314	22	No			● Cash flow, $r = .06$ n.s. to $.14\ddagger$
						● Prior year profitability n.s.
^a Thang and Quang (2005)	137	9	No		● Perceived organizational performance ($\alpha .85$), $r = .45^{**}$	● Rate of return on capital, $r = .01$ n.s. to $.15\ddagger$; on sales, n.s.
^a Tzafir (2005)	104	38	No		● Perceived organizational performance, sample (7 items, $\alpha .77$), $r = .66^{**}$	● Perceived market performance ($\alpha .84$), $r = .33^{**}$
						● Perceived market performance (4 items, $\alpha .72$), $r = .47^{**}$

(continued on next page)

Table 1 (continued)

Study	N	RR	Longitudinal	HR outcomes	Performance outcomes	Financial outcomes
^a Tzafir (2006)	206	40	No		<ul style="list-style-type: none"> Perceived organizational performance, 2000 sample (7 items, α .77), r = .67**; 1996 sample (7 items, α .76), r = .46** 	<ul style="list-style-type: none"> Perceived market performance 2000 sample (4 items, α .72), r = .47**; 1996 sample (4 items, α .77), r = .48** Return on equity (net operating gain as % of prior year capital and surplus), r = .02 n.s. Store net income, r = -.34**
^a Vandenberg, Richardson, and Eastman (1999)	49	[100]	No	<ul style="list-style-type: none"> Turnover, r = -.30* 		
^a Wiley (1991)	200	[100]	No		<ul style="list-style-type: none"> Store net sales, r = -.40** Customer satisfaction, r = .31** 	
^a Wright, McCormick, Sherman, and McMahan (1999)	38	20	No	<ul style="list-style-type: none"> Operator skills, r = .40** Operator motivation (4 items), r = .36* 		<ul style="list-style-type: none"> Financial performance (3 items, α .75), r = -.34*
Zheng, Morrison, and O'Neill (2006)	74	22	No	<ul style="list-style-type: none"> Competency, n.s. Turnover, n.s. Commitment, n.s. 		
Zwick (2006)	2079	Archival data	Panel data		<ul style="list-style-type: none"> Establishment productivity (value added: sales minus costs), + 	

RR = response rate; [100] is the response rate when the study was conducted in conjunction with a major organization, resulting in full participation.

n.s., not significant; † p < .10, * p < .05; ** p < .01; ‡Standardized beta; †††Calculated from t -tests.

^a These studies were included in the calculations of the effect size measurements reported in Table 2.

Business Premier, ABI/Inform) and manual searches. A study was only included if effectiveness was measured at the organizational level, either across organizations or large intra-organizational units (e.g., plants, lines of operation, business units, stores, bank branches). The number of organizations or organizational units forms the sample size. We excluded studies where effectiveness was measured at the work group or individual level or where organizational effectiveness outcomes were aggregated to industry level, as in some economics studies (e.g., Bartel, 2000). The most frequently assessed outcomes were organizational performance outcomes (57 studies or 85% of the sample), followed surprisingly by financial outcomes (28 studies or 42% of the sample) and then HR outcomes (19 studies, 28% of the sample).

Of the studies to be reviewed, most calculated the independent link of training to organizational outcomes. Very few studies conducted tests for mediating effects (4 studies). However, 20 of the studies assessed the effect of training in interaction with other factors. Some studies assessed the relationship between training and organizational outcomes in terms of whether training interacted with business strategy or other conditions or in terms of the fit of training with other HR practices. Hence, even though the review examines the independent effects of training, as most empirical studies do, it also reviews the interaction of training with other variables in accordance with the contingency and configurational perspectives of SHRM.

The review comprises both a qualitative review of the results of the studies and a quantitative review. Most studies used substantial controls in a multivariate approach to account for effects of other factors related to the outcomes and thus assessed the unique links of training to organization-level outcomes. However, a small number of studies, including five practitioner studies, were included that did not control for other variables. They were included because other aspects of their design helped interpretation (e.g., comparisons between high and low performing organizations), and their results were very similar to studies with controls. The qualitative review uses the results from the multivariate analyses and the group comparisons.

The quantitative review of the results is based on effect sizes calculated from bivariate correlations. If correlations were not available for such calculations, individual effect sizes were generated using information available in the published papers. Table 1 lists all the studies found for this review and their results. In Table 1 the studies included in the calculation of effect sizes are asterisked. Table 1 includes the raw correlations where possible, or otherwise reports on the relationship found, most often from the direction and significance of a parameter in a regression model but sometimes from cross-group comparisons.

Table 2 reports the overall effect sizes calculated for the relationships between training measures and the three types of organizational-level outcomes. In addition, in order to account for possible inflation bias associated with perceptual measures used to measure organizational outcomes, we calculated separate effect sizes for perceptual measures and objective measures of each outcome variable, as shown in Table 2. Perceptual measures were managers' and executives' perceptions of outcomes such as of organizational productivity or financial outcomes (perceived competitiveness, perceived profitability assessed using Likert scales) or their assessments of employees' attitudes (perceived employee satisfaction) or of customers' attitudes (perceived customer satisfaction). In contrast, objective measures were figures (e.g.,

Table 2
Overall effect sizes for training and organization level outcomes

	Overall	Objective outcome variables	Perceptual outcome variables ^a
HR outcomes' effect size	.201	.165	.244
<i>N</i> (organizations)	2815	1541	1274
<i>K</i> (number of separate samples)	14	9	5
Performance outcomes' effect size	.212	.141	.269
<i>N</i> (organizations)	6029	2883	3402
<i>K</i> (number of separate samples)	32 ^b	16	18
Financial outcomes' effect size	.151	.043	.303
<i>N</i> (organizations)	3570	2086	1484
<i>K</i> (number of separate samples)	19	11	8

^a Perceptual outcome variables were managers' and executives' perceptions of outcomes such as organizational productivity or financial outcomes or their assessments of employees' attitudes or customers' attitudes. Objective outcome variables were actual figures or accounting measures taken from archival data or company records or obtained by report from executives or were peoples' (customers, employees) measures of their own attitudes.

^b The sum of the samples measuring objective and perceptual outcome variables is greater than the number of samples in the overall effect size for performance outcomes because two samples measured both objective and perceptual outcome variables.

scrap rate, labor turnover, output per employee) or accounting measures (e.g., ROI) taken from archival data or company records or obtained by report from executives (e.g., actual percent profit of the company in the prior year) or were customers' attitudes when assessed by customers themselves (e.g., customer satisfaction) or employees' attitudes when assessed by employees themselves (e.g., job satisfaction) aggregated to the organization level.

Effect sizes were averaged across samples for the three types of organizational-level outcomes, and then weighted by sample size before being included in the overall effect size calculations. In the few cases (i.e., Lawler et al., 1998; Tzafir, 2006) where there were calculations for two totally separate samples, they were included as two separate studies. In the case where two studies used the same sample for a single type of dependent variable (e.g., Fey & Bjorkman, 2001; Fey et al., 2000), effect sizes were averaged across both studies (hence, the sample was only counted once). In the few cases for which some correlations within a study used only a subset of the overall sample, the effect sizes were weighted at the size of the overall sample after averaging the *N*s across the sample sizes (Delaney & Huselid, 1996; Harel & Tzafir, 1999; Kalleberg & Moody, 1994; Storey, 2002; Wiley, 1991). The signs of the coefficients were reversed for effects that were negatively worded (i.e. turnover) before they were included in the calculations.

5.1. Human resource outcomes

Nineteen studies reported relationships between training and HR outcomes; 13 of the studies reported 31 separate relationships that were used to calculate an overall effect size. We classify HR outcomes as follows: (a) employee attitudes (employee ratings of their satisfaction, involvement, commitment or grievances) and motivation, all aggregated to the organizational level; (b) behaviors (usually objective measures of retention, turnover or absenteeism); (c) human capital (e.g., collective skills and competencies); (d) general HR outcomes (multi-item scales combining measurement of several HR outcomes such as motivation, retention, absenteeism, and development); and (e) perceptual HR outcomes (e.g., managers' perceptions of employees' attitudes such as of satisfaction, development, attraction, retention, attendance and relations).

With respect to employee attitudes, all but one of 13 relationships reported with training were positive and significant. In particular, in firms with greater training, employees reported collectively more job satisfaction perhaps because of enhancement of their competencies and career opportunities and the support they gained from management.

With respect to employee behaviors, only one study examined the direct link of training to collective job performance, finding it nonsignificant (Horgan & Mühlau, 2006). This is despite improvement in employees' collective performance being a likely explanation for why firms that invest more in training have higher organizational performance.

The behavior most frequently measured at the organizational level to assess the effects of training has been labor turnover or retention. Seven of the eleven reported relationships were significant. Of the seven, one reported a negative relationship with turnover (Vandenberg et al., 1999) and four found positive relationships with retention (Bassi & Van Buren, 1998; Gelade & Ivery, 2003; Ngo et al., 1998; Paul & Anantharaman, 2003)—meaning companies with greater training had lower organizational turnover. One relationship was positive (Ghebregiorgis & Karsten, 2007)—meaning that companies with higher levels of training also have higher levels of voluntary turnover; and one showed a positive relationship with involuntary turnover (discharge; Shaw et al., 1998)—suggesting organizations that train discharge more staff.

In the majority of studies showing training was positively related to lower labor turnover and higher retention, training was measured as 'development', 'opportunities', 'extensiveness', and 'comprehensiveness', likely creating a positive climate within the organization, which should enhance retaining employees. The studies that provided nonsignificant results measured the simple provision of training, mostly hours provided (Cho et al., 2006; Faems et al., 2005; Shaw et al., 1998; Zheng et al., 2006) which may not contribute to a positive climate. Therefore, the significant findings may suggest that, when training is framed as a positive organizational contribution to employees' human capital development, they are more likely to stay at the organization.

When a positive relationship is found between training and labor turnover, it may mean that organizations increase their training in response to high levels of turnover. Shaw et al. (1998) found a significant and positive relationship between training and involuntary turnover and speculated that this could be because organizations initiate training when they realize they have low quality labor pools, or because organizations that value labor and train more may be more likely to discharge employees who do not meet their standards. The direction of the relationship cannot be clarified due to the use of cross-sectional research designs, but there is a suggestion that training may be an organizational response to HR problems.

With respect to human capital, four studies examined the relationship between training and employee human capital aggregated to the organizational level, finding mostly positive links. In firms that train more, operator skills are higher (Wright et al., 1999), as is staff competency (Zheng et al., 2006), and development of employee skills/knowledge, motivation, and retention (Fey et al., 2000), except for one non-significant result with workforce competence (Paul & Anantharaman, 2003). It is not surprising that organizations that train more develop workforces with greater competencies and skills.

For general (i.e., combined) HR outcomes, six of the eight studies reported relationships with training that were positive and significant. Similarly, for perceptual HR outcomes, all nine relationships reported were positive and significant. It should not be surprising that training may well influence how managers perceive the overall levels of satisfaction, retention, or skill level at their organization.

As shown in Table 2, the overall effect size for relationships between training and HR outcomes across 14 separate samples and 2815 organizations is .20. However, the effect size is .17 for objective measures and .24 for perceptual measures. The results suggest that organizations that train more gain a small positive effect in terms of HR outcomes. The conclusion requires some qualification based on the correlations shown in Table 1. The highest correlations are with employee attitudes, human capital, and general and perceptual measures of HR outcomes. The lowest correlations are with labor turnover/absenteeism, suggesting that organizations' use of training may be more related to positive attitudes than retention behaviors in their workforces.

5.2. Organizational performance outcomes

The majority of the 67 studies measured performance outcomes. Based on the measures used in previous studies, we have classified performance outcomes as follows and review the results of the studies for the outcomes in this order: (a) productivity (objectively-measured labor productivity/value added per employee, productivity growth/gains, labor efficiency, export growth); (b) sales (objectively-measured sales per employee, sales output, sales growth, new sales); (c) quality (objectively-measured waste/defects, accuracy; customer satisfaction and other responses as assessed by customers aggregated to organizational level); (d) general performance outcomes (overall performance as an objective single item measure or by combining information on several facets such as productivity, quality, customer satisfaction; growth); (e) and perceptual measures of organizational performance (managers' and executives' subjective perceptions of overall organizational performance and market performance, usually using multi-item scales and comparing their organizations' performance against other organizations).

As shown in Table 1 for productivity measures, about half (13 out of 24) of the relationships reported with training are significant and positive; ten are not significant, and one is negative. For sales, almost half (14) of 30 relationships reported in 17 separate studies were significant and positive, three were negative, and the rest were not significant or were ambiguous.

For quality outcomes, almost three quarters of the relationships reported (11 out of 15) with training were significant and positive (the negative correlations for defect density and scrap rate are included as "positive" since training was related to fewer defects and a smaller scrap rate). Four of the 15 relationships were nonsignificant. For general performance measures, almost three quarters (14 out of the 19) of the relationships reported positive and significant correlations between training and performance outcomes. The remainder was not significant.

Hence, greater training by organizations is related to greater organizational performance and, in particular, work quality including customer responses. Studies at the individual level have found that training increases employees' job performance, output and work quality (Arthur, Bennett, Edens, & Bell, 2003; Burke & Day, 1986; Guzzo, Jette, & Katzell, 1985). Hence, it is not surprising that training would have a similar relationship with organizational performance.

Finally, for perceptual measures of performance, the overwhelming majority—35 out of 40 relationships reported—were positive and significant; five were nonsignificant. As for perceptual measures of HR outcomes, it should not be surprising that managers' perception of their organization's commitment to training, whether that is in terms of amount, proportion, type or emphasis, relates positively to their perceptions of organizational performance.

As shown in Table 2, the overall effect size for the relationship between training and organizational performance outcomes across 32 separate samples and 6029 organizations is .21. When calculated separately for objective and perceptual measures, it reduces to .14 for objective measures and increases to .27 for perceptual measures. The larger effect size for perceptual measures suggests that managers and executives may overestimate the link between training and organizational performance in their organizations.

However, on the positive side, the results for the objective measures suggest that organizations that train more have a small positive effect on performance. It is worth noting that, in most of the longitudinal studies reviewed (Table 1), training increased objectively measured organizational productivity over time *beyond* the effects of prior organizational productivity, often of earlier training, of other major HR practices, and of capital investment, firm structural factors (e.g., size), and industry-across countries and sectors (Ballot, Fakhfakh, & Taymaz, 2001; Ballot, Fakhfakh, & Taymaz, 2006; Barrett & O’Connell, 2001; Bartel, 1994; D’Arcimoles, 1997; Holzer et al., 1993; Zwick, 2006). The rigor of the research designs of the studies lends support to the view that training increases organizational performance. Although the effect of training is small, calculations of the return in savings and dollar returns from training suggest that the return to training is substantial (e.g., Bartel, 1994; Holzer et al., 1993; Lyau & Pucel, 1995; Zwick, 2006).

5.3. Financial outcomes

Twenty eight studies have investigated the relationship between training and financial outcomes. We have classified these outcomes as follows: (a) profit/profitability (objectively measured gross or net profits, profit margin, increase in profit, often from archival data); (b) return as return on equity (ROE), assets (ROA), investment (ROI), or capital; (c) general financial outcomes (reports of measures such as cash flow, total assets, liquidity, market to book ratio, and overall measures of financial performance); and (d) perceptual measures of financial outcomes (managers’ and executives’ perceptions of their organizations’ financial or market performance, usually rated on multi-item scales often comparatively against other organizations).

Twelve studies contained 18 reported relationships between training and profit and profitability. Almost two fifths (seven) of the relationships were significant and positive; two relationships were significant and negative, and the remaining eight relationships were not significant. For return on equity/assets/investment, a third of the reported relationships (six out of 19) were significant or approached significance ($p < .10$); the remainder was not significant.

By contrast, among the eight studies that reported 25 relationships between training and general financial outcomes, almost three quarters (18) of the relationships were significant and positive. Another three relationships approached significance ($p < .10$); only three were nonsignificant and one relationship was negative. Finally, of the nine studies that examined the relationship between training and perceived financial outcomes, all ten of the reported relationships were positive and significant, again suggesting that managers and executives may overestimate relationships between training and organization-level outcomes.

As shown in Table 2, the overall effect size for the relationship between training and financial outcomes, across 19 separate samples and 3570 organizations, was .15. However, when the effect size is calculated for objective and perceptual measures, the effect size for objective financial measures drops to only .04 but increases to .30 for perceptual measures. Thus, the relationship between training and objectively measured financial outcomes is very small in magnitude. The effect size for objective financial measures is consistent with the results for profit and return on equity/assets/investment measures, for which most of the relationships with training were not significant. Although the majority of correlations reported for studies that used general financial outcomes were significant, most of the significant correlations came from only two studies (Berntal & Wellins, 2006; Lawler et al., 1998). The strongest evidence for a link between training and financial outcomes comes from studies that used perceptual measures rather than objective ones. Overall, training does not appear to be related to a firm’s financial performance.

5.4. The mediating perspective

Few studies have examined if the relationship between training and organizational performance is mediated by other variables, as suggested in Fig. 1. However, the results of two studies suggest that training may help to create an organizational climate that fosters employee commitment to the organization which translates into firm performance. Gelade and Ivery’s (2003) results suggest that training enhances organizational performance through its positive effects on organizational climate. They showed that training was positively related to overall performance for 137 units of a U. S. bank, especially to customer satisfaction and employee retention, directly and also indirectly by improving work climate. The positive direct link of training to sales and employee clerical accuracy was removed by the mediating effect of work climate. Ahmad and Schroeder (2003) found that training in job skills and cross-training was positively related to operational performance in 107 manufacturing plants. Mediator tests showed that training was only related to operational performance through its effect on organizational commitment within the plants. In contrast, Fey et al.

(2000) did not find that general HR outcomes mediated the relationship between training and performance in 101 foreign firms operating in Russia, but the initial relationship was not significant.

Although studies have found that training is related to organizational performance and organizational performance is related to financial performance (Guerrero & Barraud-Didier, 2004; Paul & Anantharaman, 2003), mediator tests are rare for whether organizational performance mediates the relationship between training and financial outcomes. Faems et al. (2005) conducted a mediator analysis and found that the relationship between training and financial performance in 416 Belgian small businesses was mediated by organizational productivity.

5.5. Contingency and configurational perspectives

Although most studies investigated direct relationships between training and organizational outcomes, 30% (20 studies) also examined moderators of the relationship. This has involved tests of interactions between training and contextual factors such as business strategy and capital investment (the contingency perspective) or between training and other HR practices (the configurational perspective).

In support of the contingency perspective, six studies found that training was positively related to organizational performance when matched with capital investment or strategic planning. Koch and McGrath (1996) found employee development was related to sales productivity in 319 U.S. business units when they were in high rather than low capital-intensive industries. Barrett and O'Connell (2001) found that general training was more related to sales growth when 215 Irish firms had greater investment in capital than less. Ballot et al. (2001) found that the training of managers and engineers was related to organizational productivity when 90 French and 200 Swedish firms invested more in research and development and had greater capital investment rather than investing less. Highly capital-intensive settings have high investments in property, plant, technology, and equipment per employee. They therefore need advanced specialist skills to run and, thus, more training than in low capital-intensive settings.

With respect to business strategy, the evidence suggests that matching training with a firm's strategic planning processes may increase organizational performance. Bracker and Cohen (1992) suggested the importance of the fit between training and strategic planning. They found that, in firms that were structured planners rather than unstructured planners, when entrepreneurs were trained in strategic planning rather than when not, sales grew more over five years. However, there was not a similar effect on present value growth. Newkirk-Moore and Bracker (1998) found that training senior managers in strategic planning was related to greater ROE and spread in U.S. banks with a high rather than low commitment to strategic planning. Khatri (2000) tested Miles and Snow's (1984) theory linking specific types of business strategy with work practices. In support of the contingency perspective, training was not related to organizational performance or sales growth in 194 Singaporean firms except when it was used in conjunction with firm business strategy. For example, supporting Miles and Snow's (1984) theory, when firms with a defender strategy used more training, their performance was greater. Profitability was higher when firms with an analyzer strategy used more training rather than less, but profitability was not affected by training for firms with a prospector strategy. Overall, Khatri's study provides support for matching training with business strategy, though not always in support of Miles and Snow's theory.

However, there are also some nonsignificant results. Delery and Doty (1996) found that training loans officers in 192 U.S. banks did not interact with the use of prospector or defender business strategies in predicting ROA or ROE, nor was training directly related to ROA or ROE.

With respect to the configurational perspective, the results of most studies suggest that training does not need to fit with other HR practices to be positively related to organization-level outcomes, although there is some conflicting evidence. Six studies provide support for the view that training has independent links to organizational performance rather than as part of a system of HR practices. Delaney and Huselid (1996) found that training in 590 U.S. organizations was directly related to organizational performance, and no more so when used in conjunction with six other HR practices. Ely (2004) did not find that diversity training interacted with team processes to affect organizational performance in 486 U.S. retail bank branches. Russell et al. (1985) found that training retail sales clerks was positively related to store sales performance and perceived store image in 62 U.S. retail chain stores but was not stronger when employees had greater supervisory support for job performance or sales tasks than when not. Cappelli and Neumark (2001) failed to find significant interaction effects for team training and cross-training with other work practices (e.g., self-managed teams, job rotation) in 2516 U.S. manufacturers, and neither type of training was related to productivity.

Two studies that measured financial outcomes did not support the configurational perspective, finding no interactions between training and other HR practices. Wright et al. (1999) found that training operators in 38 U.S.

refineries did not interact with how much they participated in governance activities to predict refinery managers' reports of profit. Training had an independent negative link to profits. [Delaney and Huselid \(1996\)](#) found that training was not independently related to perceived market performance in 390 U.S. firms, nor in conjunction with six other HR practices, which also did not interact among themselves.

Two studies provide mixed results for the configurational perspective. In support of an independent link for training, [Ichniowski et al. \(1997\)](#) found that a low incidence of skills training for operators in 36 U.S. steel finishing lines remained related to lower uptime (percent of time lines ran) when HR systems as a whole were taken into account. In contrast, once the effect of HR practices as a whole system was taken into account, high skills training did not explain uptime in support of the configurational perspective. [Horgan and Mühlau \(2006\)](#) found strong support in 18 Irish firms for the configurational perspective but almost no support in 40 Dutch firms. They found that Irish firms that adopted high performance HR systems had higher collective employee job performance than firms that adopted a training-centered approach and that high performance HR systems were related to organizational performance beyond the effects of training-centered approaches. However, there was little support in Dutch firms. They suggest that this was because HR systems were adopted by ailing Dutch firms or were implemented so that the HR practices were not complementary. However, the sample of Irish firms was very small, perhaps providing unreliable results.

In contrast, two studies provide support for the configurational perspective. [Faems et al. \(2005\)](#) found a strong relationship for overall HRM systems with firm profitability in 416 Belgian small businesses in stark contrast to the significant but limited links of individual HR practices to firm profitability, of which training was one practice. The relationship between training and profitability was reduced by controlling for the HRM system. [Guerrero and Barraud-Didier \(2004\)](#) found that organizational performance in 180 large French firms was explained more by bundles of HR practices than independently by training.

In summary, although few studies have directly tested the contingency and configurational perspectives, there is some evidence that training is more strongly related to productivity when it fits with an organization's capital investment intensity and business strategy than when it does not. The results for the contingency perspective for financial outcomes are mixed. As well, few studies have found support for the configurational perspective. Most have found that training is independently related to organizational outcomes; however, a few studies have found that training is most effective when it is part of a system of HR practices.

5.6. Summary of results

The results of this review suggest that firms that train more are likely to have more positive HR outcomes and greater performance outcomes, though the effect is small. However, this general statement requires some qualification. First, among the HR outcomes, the correlations are low and in the range of .13 to .36 for the relationship between training and employee attitudes. This is very likely because there are other variables that influence employee attitudes besides training. The correlations between training and turnover are particularly low and at times nonsignificant, again probably because there are so many other variables that influence employee turnover. Second, for organizational performance outcomes, the positive relationships with training are more the case for general performance outcomes and quality—outcomes which might be more proximally related to training—than for productivity or sales. Moreover, the effect sizes for objective measures indicate that firms that train more do not have greater financial outcomes, suggesting that training is not likely to improve the bottom line. Most of the positive correlations between training and financial outcomes were for perceptual outcomes and the (at times) vaguely worded “general” financial outcomes rather than for specific objective outcomes such as profit and return on equity/assets/investment.

With respect to the three categories of organization-level outcomes, the overall effect size was largest for organizational performance outcomes, followed closely by HR outcomes (the difference between the overall effect sizes for performance and HR outcomes was not significant), and weak or trivial for financial outcomes. We would have expected the largest effect size to be for HR outcomes, given the model in [Fig. 1](#) and the view that training is more proximal to enhancing HR outcomes than organizational performance outcomes ([Dyer & Reeves, 1995](#)). HR outcomes in the studies chiefly comprised satisfaction and turnover. We suspect that the slightly lower effect size for HR outcomes is due to the inclusion of retention/turnover correlations which were at times nonsignificant. It may also have to do with the smaller sample size available to calculate the effect size for HR outcomes—14 samples and 2815 organizations for HR outcomes, compared to 32 samples and 6029 organizations for performance outcomes. The effect size estimate for HR outcomes may therefore not be as reliable as the estimate for performance outcomes because of the smaller sample size.

It is not surprising, however, that the relationships between training and organizational performance and HR outcomes are stronger than for financial outcomes. The likely explanation is that training can least affect a firm's financial performance because it is most distal from HR practices and is affected by many other, more immediate, precursors (Dyer & Reeves, 1995).

It is also worth noting that the effect sizes for the perceptual measures of all three types of outcomes were higher than the objective measures. This finding reinforces the belief that perceptual outcome measures tend to result in inflated relationships. This appears to be especially the case for financial outcomes where the effect size for perceptual measures was considerably greater than that for objective measures.

Although only a handful of studies have tested the mediating relationships shown in Fig. 1, there is some support that HR outcomes mediate the relationship between training and performance. In addition, although few studies have directly investigated the contingency and configurational perspectives, some studies have found support for the contingency perspective especially for capital investment and business strategy as relevant and meaningful contingency variables. Evidence for the configurational perspective, however, is mixed. Most studies support a direct relationship between training and organizational outcomes in support of the universalistic perspective. There is some evidence that training is most effective as part of an HR system than on its own, but it is limited.

6. A critique of previous research on training and organizational-level outcomes and recommendations for future research

While there is a growing body of research on training and organizational-level outcomes, there are problems that need to be addressed to improve our understanding of how, when, and why training relates to organizational-level outcomes. The location of the research in several disciplines (e.g. HRM, economics, strategy) has resulted in a body of research that is fragmented and lacking direction. In this section, we identify shortcomings of prior studies and provide recommendations for future research. We identify both theoretical and methodological issues that have plagued previous research and need to be the focus of future research.

6.1. Theoretical issues

This review indicates that training is positively related to organizational-level outcomes after taking many other relevant factors into account. Yet, the reasons it does so are not clear, despite the explanation suggested in Fig. 1. Future research needs to test theoretical explanations for the effects of training, examine the causal direction of relationships, and examine the micro–macro link.

6.1.1. Theoretical explanations

As indicated in Fig. 1, training may increase organizational performance by increasing employees' collective attitudes and motivation, behavior (especially performance-related behaviors), and/or human capital (KSAs, competencies). Although the evidence shows that training improves individuals' knowledge, skills, and attitudes, and job performance, output and quality of work (Arthur et al., 2003; Burke & Day, 1986; Guzzo et al., 1985), this review reveals very few mediating tests of whether training affects HR outcomes which then lead to performance outcomes. However, two of the three studies testing for mediation found that training influences organizational performance by enhancing organizational climate and commitment (Ahmad & Schroeder, 2003; Gelade & Ivery, 2003), though from cross-sectional data. Thus, future research needs to test mediating effects of employee attitudes, performance-related behaviors, and human capital on relationships between training and performance outcomes using longitudinal designs as well as whether training improves financial outcomes by improving performance outcomes, as was found in the one cross-sectional study (Faems et al., 2005). In addition, more attention needs to be given to matching particular training variables (e.g., training content, methods, design and learning principles) to specific mediating variables (e.g., particular knowledge and skills) that may be responsible for improving specific organizational performance indicators (e.g., sales, quality, customer service).

Similarly, although support has been found for the contingency perspective (Ballot et al., 2001; Barrett & O'Connell, 2001; Bracker & Cohen, 1992; Khatri, 2000; Koch & McGrath, 1996; Newkirk-Moore & Bracker, 1998), there does not appear to have been any strong theoretical rationale for the choice of a contingency variable in many studies. Therefore, future research needs to examine the types of business conditions that interact with training to improve organizational

effectiveness, including conditions other than business strategy. For example, Martocchio and Baldwin's (1997) approach to strategic planning suggests that training linked to developing new business will result in greater organizational effectiveness than training to acquire skills when environments are turbulent as opposed to stable. These theories need to be subjected to more thorough empirical testing. Furthermore, there needs to be a theoretical basis for the choice of contingency variables and a model to guide future research that tests the contingency perspective.

This review found little support for the configurational perspective. However, only two studies were specifically designed to examine the configurational perspective and both found some evidence that HR practices, including training, may have less of an effect individually on productivity than when they fit with other HR practices (Horgan & Mühlau, 2006; Ichniowski et al., 1997). In most of the eight studies that tested the configurational perspective, the choice of HR practices appears to have been haphazard and without any theoretical basis. Future research needs to identify and focus on HR practices that are theoretically matched with training rather than randomly chosen (e.g., as in Baron & Kreps, 1999; Becker, Huselid, Pickus, & Spratt, 1997; Lepak & Snell, 1999) in order to provide a proper test of the configurational hypothesis.

6.1.2. Causal direction

A minority of the studies examined in this review found that training was negatively related to some HR, performance, and financial outcomes (Aragón-Sánchez, Barba-Aragón, & Sanz-Valle, 2003; Birley & Westhead, 1990; Deng et al., 2003; Ghebregiorgis & Karsten, 2007; Ngo et al., 1998; Shaw et al., 1998; Wiley, 1991; Wright et al., 1999). This might be because organizations with HR or performance problems implement training more than those without problems to improve productivity, as was found in some studies (Bartel, 1994; Wong, Marshall, Alderman, & Thwaites, 1997; Zwick, 2006). In other words, the relationship may at times be reversed such that training is the consequence rather than the cause of organizational performance. Longitudinal studies that control for past performance and test bidirectionality are needed in order to unravel this link.

6.1.3. The micro–macro link

There is sufficient evidence that training leads to both individual and organizational outcomes. However, we are still theorizing about how individual-level outcomes lead to organizational-level outcomes. If training is to increase organizational effectiveness, training must be of strategic importance to the organization, effectively designed and delivered, and it must transfer to the job. Transfer of training is thought to be the primary leverage point by which training influences organizational-level outcomes (Kozlowski et al., 2000). However, training research on transfer of training and organizational-level outcomes has progressed independently and in isolation of each other. Therefore, future research needs to integrate these two streams of research and investigate the link between transfer of training and organizational-level outcomes or what has been referred to as vertical transfer of training (Kozlowski et al., 2000).

In a similar vein, Kraiger et al. (2004) discussed the need for a theory that describes the link from training outcomes to organizational and business outcomes. This requires research that measures a variety of outcomes at both the individual-level and organizational-level of analysis and tests multi-level models that integrate the two perspectives. As noted by Kozlowski et al. (2000), there is a huge gap in the training literature on the micro-to-macro link. None of the studies reviewed in this paper examine this relationship nor has training research at the individual-level of analysis. Thus, greater integration between the individual-level and organizational-level is required in order to bridge the micro–macro gap in training research.

6.2. Methodological issues

The studies reviewed in this paper have a number of methodological limitations in terms of research design, sample size, response rate, content and measurement of training variables, type of jobs, and the measurement of organizational-level outcomes. Although there are several strengths of the studies examined (e.g., multivariate analyses, many relevant control variables, often objective measures of training and outcomes), the limitations of the studies nevertheless affect the interpretability of the results and need to be addressed if future research is to advance this area.

6.2.1. Research design

Only just over a quarter of the studies (19 out of 67) were longitudinal and thus able to account for past organizational performance and assess if training improves organizational outcomes without ambiguity about the direction of causality. The overuse of cross-sectional designs means that the causal direction of results is unclear and

common method variance is a concern. Just under three fifths of studies used the same surveys to measure training and the outcomes, usually rated by HR managers and executives/CEOs, perhaps inflating results. As indicated earlier, longitudinal designs are required especially for testing the mediating relationships shown in Fig. 1.

6.2.2. *Sample size/response rate*

The small sample sizes (mean $N=271$, median $N=157$, range of 6 to 2079) and low response rates may have affected the results and lowered their generalizability. The average response rate for 44 studies that included some form of survey was 34.3%, and ranged from a low of 3.5% to 75.5%, not including three studies that were conducted in collaboration with large organizations, where participation was mandatory and thus 100%. The average rate is comparable to the 36.1% found by Baruch (1999) for returns from CEOs/top managers and other managers (e.g., HR directors). Just over a quarter of the studies evaluated non-response with the few available variables, and found non-responding organizations similar to responding ones (e.g., Barrett & O'Connell, 2001; Cappelli & Neumark, 2001; Delaney & Huselid, 1996; Delery & Doty, 1996; Faems et al., 2005; Guerrero & Barraud-Didier, 2004; Harel & Tzafrir, 1999; Horgan & Mühlau, 2006; Huang, 2000; Martell & Carroll, 1995; Thang & Quang, 2005; Tzafrir, 2005, 2006) although some found them smaller (Bartel, 1994; Holzer et al., 1993; Koch & McGrath, 1996; Mabey & Ramirez, 2005; Wright et al., 1999). Future studies should strive for larger sample sizes and higher response rates.

6.2.3. *Content of training measures*

A major problem and source of inconsistency across studies has been the type of training measure used. As a result, previous studies have failed to identify what it is about training that is most likely to influence organizational-level outcomes (e.g., amount, type, methods, etc.). Further, the measures of training have tended to be general rather than specific, limiting understanding of what kind of training improves organizational effectiveness. We can say that firms that provide more training will have a workforce with more positive attitudes and will have greater organizational performance. However, it is difficult to understand what it is about the training that makes it more or less likely to be related to organizational-level outcomes. We found no theory in the papers reviewed which might indicate that some measures of training might be better suited to predicting organizational outcomes than others; researchers tend to use measures that are available (e.g., archival data) rather than being theoretically linked to the outcomes of interest. Future research should consider the training constructs that are being measured, go beyond general and simplistic measures of the amount of training, and provide a theoretical basis for the choice of a training measure. Research also needs to match the content of training with the organizational outcomes measured. Stronger effects for training have been obtained when training content is matched to training outcomes (Johnson, 1996; Russell et al., 1985).

6.2.4. *Measurement of training*

In addition to differences in the content of training measures across studies, the way that training has been measured also raises concerns about reliability and validity. Single item measures of training have often been used because the researchers were restricted to archival data sets (e.g., Ballot et al., 2001; Bartel, 1994; Birley & Westhead, 1990). Training measures from existing records are not necessarily better than subjective measures (Noe & Wilk, 1993); however, subjective single items are less accurate than aggregate measures, irrespective of the source (Barron, Berger, & Black, 1997). Although a third (23 out of 67) of studies used multi-item measures of training, the items were not always aggregated into composite scales, but rather, treated as single item measures in the data analysis (e.g., Aragón-Sánchez et al., 2003; Lawler et al., 1998; Storey, 2002). Of the studies that used aggregate scales, most reported acceptable internal consistency reliability. Moreover, perceptual measures were often completed by single respondents. According to Wright et al. (2001), single respondent measures of HR practices have high levels of error. As a result, they recommend the use of multiple raters and aggregation of their ratings, something that should also be considered in future research on training and organizational-level outcomes. Some studies have made an effort to collect data from multiple sources (e.g., Delery & Doty, 1996; Ely, 2004; Vandenberg et al., 1999); however, they remain in the minority. Future research needs to use clearly constructed scales with multiple items in order to address existing concerns of reliability and validity.

6.2.5. *Job type*

Previous studies have varied in terms of the job type. Just over half of the studies assessed training for all employees in an organization. The rest did so for specific jobs, usually core jobs (e.g., industrial operators, bank loans/customer service officers, retail sales clerks), but also for entrepreneurs, managers, and executives. Future research needs to

examine the effects of training for different types of employees whose jobs may vary in terms of the strategic importance to the firm. The effects of training on different outcomes might vary from job to job. Thus, the effect of training might vary in terms of the training content as discussed earlier, as well as the job type.

6.2.6. Measurement of organizational-level outcomes

The measurement of the outcome variables has also been a problem in previous studies and requires more serious attention. Almost half of the studies measured organizational and financial outcomes subjectively (e.g., managers' perceptions). They may not have measured the bottom line as accurately as did the half that used objective absolute measures (e.g., ROE, ROA) and may have considerably inflated the overall effect sizes estimated here. In addition, measures of employee attitudes provided by managers and executives and of customer attitudes provided by employees are not as valid as they would be if given by the sources themselves. Future studies need to be especially concerned about subjective and perceptual measures which we found tend to result in inflated relationships compared to more objective outcome measures.

7. Conclusion

Although training is a major topic and area of research in human resource management and industrial/organizational psychology, research on training and organizational-level outcomes has been the exception rather than the rule. Instead, the focus of training research in the HRM and I/O psychology literatures has been the individual-level of analysis even though one of the primary goals of training is to enhance organizational effectiveness (Kozlowski et al., 2000). As a result, much of what has been learned about the science and practice of training has not been incorporated into research on training at the organizational-level of analysis.

This paper presents the first review of research on training and organizational-level outcomes. The results suggest that training is positively related to human resource outcomes and organizational performance but is only very weakly related to financial performance. Training does indeed assist in enhancing organizational effectiveness, though there is much more to do to understand this relationship. In particular, research needs to examine the effect of the type of training content, the match of training content with the organizational-level outcome, the type of training methods and design and learning principles, the type of employees trained, and the implication for transfer of training to understand why training enhances organizational effectiveness. In conclusion, we hope this review alerts training researchers of the need to improve research at the organizational-level of analysis and to integrate training research at the individual-level of analysis and research at the organizational-level of analysis—something that is very much needed to bridge the micro–macro gap in the training literature.

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