EMPLOYEE ENGAGEMENT AND PERFORMANCE: A META-ANALYTIC STUDY OF CAUSAL DIRECTION

ABSTRACT

Based on 2,178 business units in 10 organizations, this study used meta-analysis to examine the causal direction of the relationship between employee engagement and business-unit outcomes of employee retention, customer loyalty, and financials. Competing models were tested using longitudinal path analysis. Results indicate a stronger relationship from employee engagement to business outcomes than from business outcomes to employee engagement.

INTRODUCTION

More than 10,000 publications on the subject of employee attitudes have yielded a variety of theories and findings concerning the attitude-performance relationship. Meta-analyses have provided clarity to the magnitude of relationship between employee attitudes and performance. These large-scale analyses of many studies have substantiated the theory that there is a positive relationship between job satisfaction and performance at the individual level (Judge, Thoresen, Bono, & Patton, 2001) and at the business-unit level (Harter, Schmidt, & Hayes, 2002). These relationships are large enough to represent substantial practical value to organizations.

While research has begun to clarify the relationship between attitudes and performance, the direction of the causal arrow (from attitude to performance or performance to attitude) is less clear. Most studies of the relationship between employee attitudes and performance have been conducted at the individual level, but many have also been conducted at the work-unit level, while fewer have been conducted at the company level. Each type of analysis has its own advantages and disadvantages in understanding the direction of the causal arrow. Individual-level analyses have a statistical power advantage (easier to obtain large sample sizes), but a causal disadvantage in confounds of traits vs. attitudes that must be controlled for (Judge, Locke, & Durham, 1997; Arvey, Bouchard, Segal, & Abraham, 1989). Organization-level studies involve aggregating individual responses for organizational groups, and then treating the number of organizations as the unit of measure. Organization-level analyses can present sample-size concerns, but provide several advantages: they study relationships to business outcomes that are relevant and often comparable across units, and average across individuals to reduce confounds by the effects of individual differences such as personality and mental ability on work outcomes (thus, providing more valid measures of "organi-

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zational climate"). In addition to being the level at which employee attitude data are typically reported, organization-level employee attitude data allow researchers to study the extent to which attitudes affect business outcomes.

Organization-level studies can be classified into at least two different types: those that study work units within large organizations (referred to as business units in Harter et al., 2002) and those that study large organizations themselves as the unit of measure. Sample-size concerns can present the greatest challenges in the latter case, because it is difficult to obtain a large number of organizations and difficult to establish similar metrics for business outcomes across organizations. When studying work units within organizations, researchers can often obtain outcome data that are comparable across work units within the same company. At the company level, this can present a greater challenge, because companies often differ in function, industry, and employee type. Even when companies are measured on similar metrics, such as ROA, ROI, and EPS, such measures are extremely suspect when comparisons are made over time for companies in different industries. Macroeconomic changes can affect some industries more severely than others, making comparisons troublesome. For work units (or business units) within organizations, macroeconomic changes are more likely to have similar effects across business units, making comparisons more valid over time. The number of business units within a company is often not large, but correlations computed separately for each company can be combined in a meta-analysis, producing estimates of relationships that are quite precise.

In addition to levels of analysis, studies can be classified by type of design: cross sectional, cross-lagged panel, and longitudinal path analysis. Most studies conducted to date have been of the cross sectional variety (correlating employee attitudes with concurrent and trailing outcomes). However, some cross-lagged panel designs have been used, and researchers have used longitudinal path analysis to study the direct and indirect effect of employee attitudes on outcomes. The causal attributions associated with cross-lagged panel designs have been called into question, as will be discussed later.

CORRELATION STUDIES

Early organization-level research focused primarily upon cross sectional studies. Independent studies found relationships between employee attitudes and performance outcomes such as safety (Zohar, 1980, 2000), customer experiences (Schneider, Parkington, & Buxton, 1980; Ulrich, Halbrook, Meder, Stuchlik, & Thorpe, 1991; Schneider & Bowen, 1992; Schneider, Ashworth, Higgs, & Carr, 1996; Schmit & Allscheid, 1995; Reynierse & Harker, 1992; Johnson, 1996; Wiley, 1991), financials (Denison, 1990; Schneider, 1991), and employee turnover (Ostroff, 1992). A recent study by Batt (2002) used multivariate analysis to study the relationship between human resource practices (including employee participation in decision making) and sales growth. Additionally, a large-scale meta-analysis (Harter, et al, 2002) was recently updated (13,751 business and work units), studying the concurrent and predictive relationship of employee attitudes (satisfaction and engagement) with safety, customer attitudes, financials, and employee retention (Harter, Schmidt, & Killham, 2003). The above studies have found, rather consistently, that there are positive concurrent and predictive relationships between employee attitudes and various important business outcomes.

CROSS-LAG CORRELATION (CLC) STUDIES

Studying the predictive relationship between employee attitudes and performance adds one element to the causal argument that attitudes cause performance, particularly when these predictive relationships are based on the higher quality data that can be produced by meta-analysis (Harter et al., 2002). Cross-lag panel designs have been less common. In this design, correlation of time-1 employee attitudes and time-2 performance is compared to correlation of time-1 performance to time-2 attitudes. Ryan, Schmit, and Johnson (1996) conducted CLC analyses of 142 auto finance company branches, and Schneider, White, and Paul (1998) looked at bank branches. Koys

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(2001) conducted cross-lagged analyses of 28 restaurants. Recently, Schneider, Hanges, Smith, and Salvaggio (2003) conducted a company-level cross-lag study (n=35) where time series data were available for up to eight years for some companies. Findings have been mixed, and causal implications taken from these studies have been inconclusive. This could in large part relate to small sample sizes in these studies. However, the CLC design also has serious methodological limitations (Campbell & Kenny, 1999; Rogosa, 1980; Billings & Wroten, 1978). There appears to be general consensus that CLC analyses are insufficient to draw causal inferences. Most critiques center on the under-identified nature of CLC analyses. CLC tends to ignore variables beyond the two included in the design, and has historically been conducted in samples that are too small and interpreted with use of significance tests (the variable with the greatest number of significant differences in the appropriate direction has typically been called the "causal winner"). The latter concern (determining causal direction on the basis of significance tests under conditions of low power) is apparent in the above-referenced CLC studies. Two CLC effects sizes of nearly the same value (or containing overlapping confidence intervals) can be judged to be different on the basis of individual significance tests, when they are truly not different. Even with sample sizes as high as 100, 95% confidence intervals can exceed a width of .30. Statistical power concerns (Type 2 errors) can greatly undermine the credibility of such analyses and interpretation from them. Finally, the above studies have largely ignored issues of measurement error, which also biases the observed results.

LONGITUDINAL PATH ANALYSES

Given adequate sample sizes, path analysis provides the potential to study longitudinal data and also control for additional variables. Path analysis has been used with longitudinal data in a few cases (Schneider et al., 1998; Ryan et al., 1996; Harter, 2000; Koys, 2001). Findings once again have been mixed. In some cases, the causal direction appears to go from employee attitudes to performance, and in other cases the reverse. It is possible that this variance in findings is due to model misspecification (for example, it could be that quality of management explains both attitudes and business-unit performance). The mixed findings could also be due to inadequate sample size. Recently, Gelade and Ivery (2003) tested work climate as a mediator in the relationship between HR practices and performance. They found positive relationships between work climate and performance in 137 bank regions. However, no longitudinal analyses were conducted, employee response rates were low, and there was no attempt to correct for measurement error.

Campbell and Kenny (1999) argued for CLC as a first step to causal analyses in order to show that spuriousness cannot explain the covariation between the variables. Then if the relation between the variables does not appear to be spurious, path analysis can be applied to the data. However, the decision about spuriousness rests on significance tests under conditions of inadequate power. The risk in relying on significance testing is equal to the probability of type II error, or one minus statistical power. In many cases, use of significance tests will lead to false conclusions regarding the direction of the relationship (Schmidt, 2002; Cohen, 1994).

We argue that it is preferable to first establish stable estimates of the bivariate relationships among the variables across time, and then attempt to test the causal models. Using significance tests to determine the efficacy of relationships across time is inconsistent with the intent of most causal analyses: to develop theories and practices based on *both* order and magnitude of the causal arrow. We want to know the extent to which one variable causes another *and* the extent of the reciprocity.

Longitudinal studies provide an accurate means of drawing causal inference only to the extent that there are large sample sizes, ability to correct for measurement error, and no unmeasured mediators or moderators interfering with the relationships. The present study attempts to directly address each of these potential limitations.

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Billings and Wroten (1978) provide a summary of procedures and issues to consider in conducting path analysis, including prespecification of the variables and causal ordering, addressing issues of multicollinearity, longitudinal models, reproducing the correlation matrix, and treatment for measurement error. Hunter and Gerbing (1982) also provide useful distinctions between causal models and statistical summaries, multiple causation, and recursive versus nonrecursive models.

HYPOTHESES

The purpose of this study is to use longitudinal data derived from large sample meta-analyses to test hypotheses about the direction of causality underlying obtained relationships between work attitudes and business outcomes at the business-unit level.

The hypotheses examined in this study were as follows:

Hypothesis 1: Business-unit-level employee engagement causes future organizational outcomes of customer loyalty, employee retention, and financials.

Hypothesis 2: The path from employee engagement to customer loyalty, employee retention, and financials is somewhat reciprocal, but is stronger from employee engagement to customer loyalty, employee retention, and financials than the reverse.

THE PRESENT STUDY

Past causal research has used individual studies of business units and small company-level sample sizes (e.g., Schneider et al., 2003) to assess directionality. However, a longitudinal path analysis of the meta-analytically determined relationships between employee attitudes and outcome data across companies has yet to be conducted.

Gallup has maintained a growing database of responses to its employee engagement (Q^{12}) instrument (an antecedent to job satisfaction and other outcomes), using identical questions and wordings across client organizations. Linkages of this instrument to a variety of organizational performance outcomes are summarized in Harter et al. (2002) and Harter and Schmidt (2002). Included as a subset of studies in this database are data for companies that have collected Q^{12} data and business outcome data for multiple time periods. For these data, longitudinal correlations can be calculated for use in path analytic research on direction of causality.

As Rogosa (1980) showed, cross-lagged correlations are not sufficient to provide confidence of causal direction. Rather, mediating relationships should be considered in interpreting the size and direction of longitudinal correlations. That is, as indicated in Harter et al. (2002), the relationship between employee engagement and financial outcomes is likely mediated by more proximal outcomes such as employee retention, customer loyalty, and safety. The hypothesized causal model proposed here is that employee engagement causes more proximal performance outcomes such as employee retention and customer loyalty (meta-analytic longitudinal data on safety were insufficient to be included in this analysis), which then cause financial outcomes such as sales and profit. It is also hypothesized (consistent with Harter et al., 2002) that there is a reciprocal relationship from financials to employee engagement. That is, we propose that when employees are engaged, businesses perform more efficiently, and that when businesses perform more efficiently, employees also become more engaged. It is likely that engaged employees feel a strong sense of ownership for the organization's outcomes, and therefore contribute to improvement in the performance of the organization. It is also likely that, as organizations improve performance, they reinvest more in their people, creating a sense of increased pride or ownership. This is an example of a nonrecursive model, where there are one or more circular causal chains. Nonrecursive causal models are difficult to test with only one time period of data, but are more easily testable using longitudinal data (Hunter & Gerbing, 1982). As will be discussed below, the data in the present study provide great opportunity to test this proposed model. We see this reciprocal relationship as an important cycle that should be expected in healthy organizations. However, we propose that the relationship is

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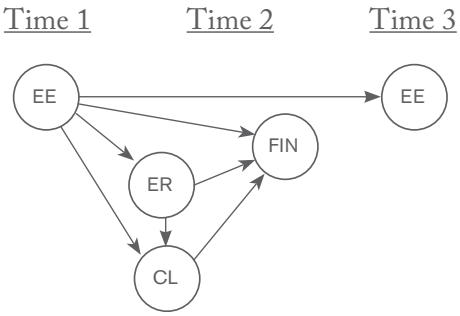
stronger from employee engagement to financials than the reverse. In testing this hypothesized causal process, one can compare the longitudinal path of time-1 employee engagement predicting time-2 outcomes with the path of time-2 outcomes predicting time-3 employee engagement. Our prediction is that the former path will be stronger than the latter path. The present study will first meta-analyze the bivariate relationships between employee engagement at time 1 and outcomes at time 2; then, it will meta-analyze the relation between outcomes at time 2 and engagement at time 3; finally, it will meta-analyze the interrelationship among the outcome variables. The meta-analytic bivariate correlations will then be entered into a path analysis to test the directionality predictions of our causal model.

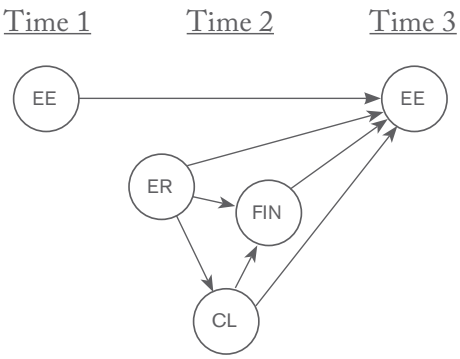
The path analytic models tested are presented in Figures 1 and 2. Model 1 indicates employee engagement at time 1 causes outcomes at time 2 and subsequent engagement at time 3. Model 2, the competing model, indicates employee engagement at time 1 causes only employee engagement at time 3, and does not cause customer loyalty, employee retention, and financials at time 2. Rather, time 2 customer loyalty, employee retention, and financials cause engagement at time 3.

Figure 1 — Employee Engagement Predicts Performance Model 1



Note: EE = Employee Engagement
ER = Employee Retention
CL = Customer Loyalty
FIN = Financials (Profit & Sales)

Figure 2 — Performance Predicts Employee Engagement Model 2



Note: EE = Employee Engagement
ER = Employee Retention
CL = Customer Loyalty
FIN = Financials (Profit & Sales)

METHOD

The steps taken in conducting the longitudinal path model were as follows:

1. Calculate the correlation of time-1 employee engagement (EE_1) with time-2 employee retention (ER_2), time-2 customer loyalty (CL_2), and time-2 financials (sales and profit, FIN_2) for each study.

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2. Calculate the intercorrelation of the performance variables (at time 2) for each study.

3. Conduct a meta-analysis of each of the bivariate correlations in #1 and #2.

4. Assemble a meta-analytic correlation matrix.

5. Use the correlation matrix with path analysis methods to test the fit of the models specified in Figures 1 and 2.

6. Interpret the fit of each model using Chi Square GFI, standardized root mean squared residuals (SRMR), and interpretation of the magnitude and direction of path coefficients.

INDEPENDENT VARIABLE MEASURE

The primary independent variable measure used in this study is the Gallup Q^{12} Instrument. The Q^{12} is an indicator of employee engagement or general workplace climate, consisting of items measuring the involvement and enthusiasm of employees in the workplace (Harter et al, 2002). The instrument has been studied extensively relative to its concurrent and predictive criterion-related validity, reliability (test-retest = .80 and Cronbach's alpha = .91), and convergent validity to attitudinal outcomes such as job satisfaction. Attempted census surveys are conducted for participating organizations (median participation rate = 83%).

DESCRIPTION OF THE DATA

The present study includes a total of 2,178 business units of varying types and from 10 companies in six industries. Each study (for each company) included multi-time-period Q^{12} data and at least one time period of outcome data for each business unit. Each business unit's score on employee engagement was the average across the 12 employee engagement items. The variability of engagement scores across business units was the same for both years in which Q^{12} data were collected.

Even though the facets of engagement represent multiple discrete aspects of the workplace, the instrument as a whole is sufficiently unidimensional to be used as a composite measure (Harter et al., 2002). Employee engagement data were aggregated across respondents from each business unit.

Time periods varied by organization, with three companies providing quarterly performance data, three companies providing semi-annual performance data, and four companies providing annual performance data. Because employee engagement data are collected at one point in time (typically 2- to 3-week field periods), performance data were aggregated to represent the period in time trailing the first employee engagement measurement, and preceding the second employee engagement measurement. For 8 of 10 companies, employee measurements were conducted on an annual basis, and for the remaining two, on a semiannual basis. For instance, if the employee measurement was conducted on a semiannual basis, the performance data were collected for the six-month time period trailing the first measurement and preceding the second measurement.

For the eight companies conducting annual measurements, the methodology varied slightly. Three studies correlated time-1 engagement to time-2 annual performance and time-2 annual performance to time-3 engagement. Three studies used the six months of performance data trailing the time-1 employee measurement and the six months of performance data preceding the time-3 employee measurement. Two studies used the quarter trailing the time-1 employee measurement and the quarter preceding the time-3 employee measurement. In the selection of studies for this meta-analysis, each company was represented once, and all available studies were included (removing possible publication bias). For six organizations in this analysis, multiple longitudinal studies were conducted. Where multiple longitudinal analyses were available for the same organization, the researchers averaged the estimates for the various time series analyses across studies so that one entry was made for each analysis type (time 1 to time 2; time 2 to time 3) for each organization. Therefore, the correlation estimates from most companies were much more robust

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than individual studies with only one longitudinal analysis. Table 1 provides a summary of the type and number of companies included in the meta-analyses. Table 2 provides a summary of types of business units included in the meta-analyses. There was considerable range in industry and type of business unit represented in the studies. Business units ranged from retail stores to manufacturing plants to hospitals to sales offices.

Table 1 — Industry Representation of Longitudinal Studies

Industry	# of Companies	# of Business Units
Healthcare	1	162
Financial	1	610
Manufacturing	2	76
Retail — Merchandise	3	688
Retail — Food	2	542
Transportation	1	100
Total	**10**	**2, 178**

Table 2 — Frequency of Business Unit Type

Business Unit Type	# of Companies	# of Business Units
Branch	1	610
Hospital	1	162
Plant	1	60
Region	1	100
Restaurant	1	228
Sales Team	1	16
Store	4	1,002
Total	**10**	**2, 178**

DEPENDENT VARIABLE MEASURES

Dependent variable measures are described in detail in Harter et al (2002).

Employee Retention (ER). Employee Retention data were available for five companies and 888 business units. The retention measure used was the annualized percentage of employee retention (retention rate) for each business unit (including both voluntary and involuntary turnover — reverse scored as retention).

Customer Loyalty (CL). Customer loyalty data were available for six companies and 1,120 business units. Customer instruments varied slightly by company, but included, in all cases, measures of customer advocacy for the business unit measured (likelihood to recommend, likelihood to repurchase, and satisfaction). The CL metric in each case was an average of the items included in each measurement, aggregated across customers sampled.

Financial Performance (FIN). Financial data were of two types, amount produced (business-unit sales) and margin (percent profit of total revenue). In many organizations, there are location-specific variables that influence ability to compare financials across business units. Location variables often include the age of the business unit, the local market (including competitor proximity and density), and population base. Such variables can influence the expected amount of business for any given business unit. It is typical in such cases for organizations to use targets (i.e., budgets, plans, quotas, or prior year's performance) as a method of more accurate comparison. When appropriate, these difference variables were used as the financial outcome variable in correlational analyses. When business units were determined (by review of researchers and client) to be comparable on financials, the raw figures were used. To the extent possible, then, location was controlled for in the analyses. Because sales and profit are highly correlated, we used one financial variable in path analyses (an equally weighted composite of sales and profit). Further details are provided in Harter et al (2002).

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META-ANALYTIC METHODS USED

Each correlation in the variable matrix of correlations was the weighted average correlation across companies, appropriately corrected for artifacts. This included longitudinal correlation estimates for employee engagement at time 1 paired with time-2 performance and time-2 performance paired with time-3 employee engagement. A meta-analysis of each of the bivariate dependent variable relationships was also conducted. The meta-analysis methods used were those of Hunter and Schmidt (2004), as implemented by the Schmidt and Le (2004) program for artifact distribution meta-analysis. Relations among dependent variables were calculated in the same time period (time period 2), allowing researchers the opportunity to calculate path coefficients based on the full intercorrelation matrix of variables in the study. As will be discussed later, it may be possible for future research to focus on the additional time lag from customer loyalty and employee retention to financial outcomes if these data can be obtained. This would help to more explicitly test the prediction discussed earlier that employee engagement predicts proximal outcomes that, in turn, predict more distal financial outcomes. For purposes of this analysis, we treated customer loyalty and employee retention as mediators of the relationship between employee engagement and financial performance, even though they were measured during the same time frames as was financial performance.

In addition to weighted average estimates of correlation, analyses also included standard deviation estimates of the observed correlations. As part of the meta-analysis, corrections were made for sampling and measurement error. Because we did not have range-restriction estimates for the performance variables (all of which were measured on different scales across companies), we did not correct for range restriction, which means the estimates presented here may be somewhat lower than we would expect in the population of all business units. These results should be seen as representative of the relationships between the variables within the average company. The specific calculational procedure used was the interactive procedure for artifact distribution meta-analysis (Law, Schmidt, & Hunter, 1994; Schmidt & Le, 2004; Hunter & Schmidt, 2004). Test-retest reliabilities of both independent and dependent variables included in this study have previously been reported (Harter et al., 2002) and were used for this study.

For each bivariate relationship, we report the weighted average correlation, observed standard deviation of the correlations, the true score correlation (correcting for independent and dependent variable measurement error), and the true score standard deviation.

PATH ANALYSES

Once the meta-analytic correlation matrix was assembled, we tested each of the proposed models using PATH (Hunter & Hamilton, 1992), a least-squares path analysis program that provides path coefficients corrected for measurement error and standard errors of the path coefficients. In calculating standard errors, we conservatively used the minimum sample size observed across all of the bivariate relationships (n=883). Each of the two proposed models was tested for fit using Chi Square GFI and standardized root mean squared residuals (SRMR) by reproducing the correlation matrix as recommended by Billings and Wroten (1978). Hu and Bentler (1999) recommend SRMR as a fit index and have found it to be the index most sensitive to simple model misspecification. They recommend a cutoff value of .08 or less as indication of adequate fit. Kline (1998) recommends a cutoff value of .10 or less. Fit indices were compared between the two models.

RESULTS

Table 3 provides the meta-analytic results for each of the longitudinal relationships studied. Based on both observed and corrected correlations, employee engagement (EE) is a stronger predictor of customer loyalty, employee retention, sales, and profit than the reverse. This finding was most generalizable for the relationships of engagement to customer loyalty and employee retention, which are theoretically more direct outcomes of employee engage-

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ment. For instance, after correcting for measurement error in both variables, the longitudinal correlation of EE at time 1 (EE_1) to customer loyalty at time 2(CL_2) was .31. The reverse relationship (of CL_2 to EE_3) was .14. For EE to employee retention (ER), the longitudinal correlations were .26 and .06, respectively. For sales, the longitudinal correlations were .22 and .17, and for profit, they were .13 and .10, respectively. Based on the longitudinal correlational analysis alone, the relationship between EE and financials appears somewhat reciprocal.

(See Table 3 on page 14).

Table 4 presents meta-analyses of the concurrent relationships among the four criterion variables. Among the meta-analytic true score relationships, the relationship was highest between sales (productivity) and profit (.76), although the magnitude of this relationship varies by company (sd=.27). Among the nonfinancial variables, the relationship was strongest between employee retention and customer loyalty (.38), and this relationship did not vary across companies. Employee retention was positively related to both financial variables, and customer loyalty was positively related to both financial variables. These relationships varied somewhat in magnitude across companies.

(See Table 4 on page 15).

Table 5 presents the correlation matrix assembled using the true score correlations from the meta-analyses. The correlation of time-1 EE to time-3 EE was taken from previous test-retest studies on the Q^{12} metric (Harter et al., 2003). The correlation between EE_1 and EE_3 is lower than the test-retest reliability, due to the extended time gap between the former (from time 1 to time 3, rather than time 1 to time 2). Additionally, the formula for test-retest reliability for variables with expected real change adjusts the test-retest correlation to account for the difference between shorter and longer time periods (Schmidt & Hunter, 1996, scenario 23).

(See Table 5 on page 15).

The mean meta-analytic bivariate relationships were path analyzed according to the path models specified in Figures 1 and 2. Path coefficients for the relationship between employee engagement and each of the criterion variables (corrected for test-retest reliability in both independent and dependent variables) are compared for each of the two models in Figures 3 and 4. The path from EE_1 to ER_2 is clearly directional, with higher EE_1 corresponding with higher ER_2 (ß=.26, model 1). The reciprocal relationship is negative (ß=–.10, model 2). This may be related to a pattern seen in EE by tenure, where newcomers to an organization tend to be more engaged (Brim, 2002). Therefore, business units with increased turnover will have more newly hired employees, and as a function of this, somewhat higher future engagement (albeit employees who have less tenure). The path from EE_1 to CL_2 is also clearly directional (ß=.23, model 1), with essentially no reciprocal relationship present (ß=-.03, model 2). The direct relationship of EE to FIN is larger (ß=.11, model 1) than the reverse path (ß=.05, model 2), although FIN_2 appears to have a small possible reciprocal relationship with EE. The path from EE_1 to FIN_2 is approximately double that of the reverse path.

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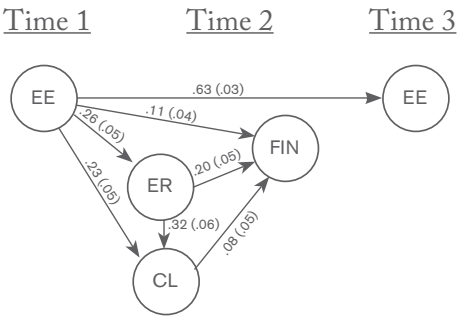
Figure 3
Model 1 Results: Employee Engagement Predicts Performance

Model 1

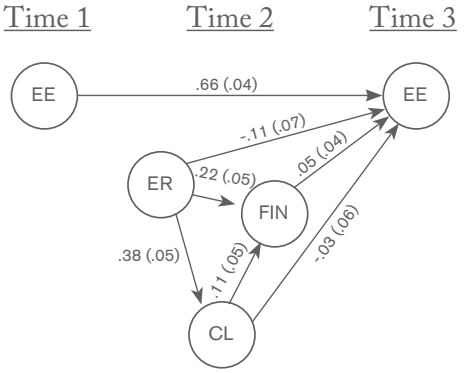


Model Fit
Chi Square GFI = 2.90
df = 3
p = .407
SRMR = .033

Note: EE = Employee Engagement
ER = Employee Retention
CL = Customer Loyalty
FIN = Financials (Profit & Sales)

Figure 4
Model 2 Results: Performance Predicts Employee Engagement

Model 2



Model Fit
Chi Square GFI = 15.44
df = 2
p = .000
SRMR = .082

Note: EE = Employee Engagement
ER = Employee Retention
CL = Customer Loyalty
FIN = Financials (Profit & Sales)

Model 1 had good fit with Chi Square GFI nonsignificant (2.90; p=.407), and SRMR of .033. Model 2 had poorer fit with significant Chi Square GFI (15.44; p<.001) and SRMR of .082. There were no significant nonhypothesized links in Model 1 and two significant nonhypothesized links for endogenous variables in Model 2 (from EE_1 to CL_2, and from EE_1 to FIN_2). Overall, the path analyses supported the hypothesis that EE causes performance. Hypothesis 2 stated a "reciprocal" relationship between EE and FIN. Path coefficients suggest, as hypothesized, a stronger causal relationship between EE and FIN than the reverse, but also a slight reciprocal relationship. As indicated, the fit of Model 1 was quite good, and there was no indication from the missing-link analyses that the model would be improved through additional links. Model 2, while showing weaker fit, still has an SRMR of .082, adequate according to the guidelines of Klein (1998) but just beyond the cutoff set by Hu and Bentler (1999). As such, there is some evidence for reciprocal causality. The reciprocal path, albeit small, should be tested in larger samples in the future.

DISCUSSION

The predictive validity of the relationship between employee engagement and various business outcomes has been studied extensively through meta-analysis (Harter & Schmidt, 2002; Harter et al., 2002). Such studies have documented that engagement at time 1 is predictive of a variety of outcomes at time 2, including customer loyalty, employee retention, productivity, safety, and profitability. The relationships uncovered through meta-analysis have also been shown to represent substantial utility to many organizations. Harter et al. (2002) pointed out that future research should continue to focus on issues of causality, through "a body of research" and "a multitude of types of evidence." One such type of evidence is time series data. The present study expands on the earlier work by studying longitudinal path analyses of the meta-analytic relationships. Findings presented here provide the strongest framework to date for making causal inferences of the relationship between employee attitudes and performance

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outcomes. For longitudinal analyses to provide a credible means of causal inference, they must be based on large datasets, take into account mediating variables through path analysis, and include correction for measurement error. The present study meets these requirements.

While the present dataset is diverse (in terms of industry and business unit type), future research should focus on expanding the current study. While the relationships between EE and the criterion variables were widely generalizable (consistent with Harter et al., 2002), the relationships among the criterion variables (while in the same direction across organizations) often varied in magnitude. If the individual company criterion variable intercorrelations vary substantially from the mean values reported here, it may have some unknown effect on the path coefficients. Future research should focus on the time-lagged correlations among the various criterion variables, and expand on the number of criterion variables (for instance, safety) to produce an expanded path model. Employee engagement did show a causal impact on financial outcomes, and this impact was partially mediated by customer loyalty and employee retention. It is likely that the direct effect of EE on financials is due to under-representation of mediating variables. That is, it is possible that if all mediating variables were included, there would be no remaining direct effect of EE on financial outcomes; all effects of EE would be indirect, through mediating variables. It is also possible that additional lags in the criterion variables (for instance, from customer loyalty to financials) would further change the path coefficients. Past research has indicated meaningful time-period lags from customer metrics to financials (Fleming, 2000). Additional customer constructs should also be explored in future research, such as customer engagement. Meta-analytic research indicates interactive effects on financials when both employee and customer engagement are considered (Harter, Asplund, & Fleming, 2004; Fleming, Coffman, & Harter, 2005). At minimum, the present research suggests employee engagement as a strong causal variable in relation to the direct outcomes of business-unit customer loyalty and employee retention.

The relationships documented in this report are consistent with the size of relationships reported in Harter et al. (2002), which demonstrated substantial utility in relation to profitability, sales, turnover, and customer loyalty. Investigators often ignore the practical value of the effect sizes, and we would argue that such estimates derived from business-unit-level studies have high credibility.

This study extends our prior work on the relationship between employee engagement and business outcomes to further explore issues of causality. Results provide positive support for employee engagement as a causal predictor of various outcomes. One implication is that changes in management practices that improve employee engagement may increase business-unit outcomes, including financials. This study indicates a directional relationship from employee engagement to outcomes such as employee retention and customer loyalty, and a directional and possibly reciprocal relationship between engagement and financials, although clearly stronger from engagement to financials than the reverse. We would expect that in most healthy business units, a reciprocal relationship would exist, in which engagement fuels better management and better management fuels ownership and engagement (involvement and enthusiasm).

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Table 3 — Meta-Analysis of Longitudinal Correlations

Analysis	EE_1 to ER_2	ER_2 to EE_3	EE_1 to CL_2	CL_2 to EE_3	EE_1 to $Sales_2$	$Sales_2$ to EE_3	EE_1 to $Prof_2$	$Prof_2$ to EE_3
No. of business units	883	888	1,120	1,087	1,481	1,509	1,534	1,581
No. of r's	5	5	6	6	7	7	8	8
Means observed r	.16	.03	.22	.11	.18	.14	.11	.08
Observed sd	.05	.03	.05	.10	.12	.11	.06	.05
p	.26	.06	.31	.14	.22	.17	.13	.10
SD_p	.00	.00	.00	.07	.12	.10	.00	.00
95% Cl	.15 to .35	-.04 to .15	.23 to .38	.07 to .23	.16 to .72	.11 to .23	.07 to .19	.04 to .15

Note: p = True correlation corrected for independent and dependent variable measurement error; 95% Cl = 95% confidence interval of true correlation

EE_1 = Employee Engagement measured at Time 1
ER_2 = Employee Retention measured at Time 2
EE_3 = Employee Engagement measured at Time 3
CL_2 = Customer Loyalty measured at Time 2
$Sales_2$ = Sales measured at Time 2
$Prof_2$ = Profit measured at Time 2

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Table 4 — Meta-Analysis of Performance Variable Correlations						
Analysis	ER_2 to CL_2	ER_2 to $Sales_2$	ER_2 to $Profit_2$	CL_2 to $Sales_2$	CL_2 to $Profit_2$	$Sales_2$ to $Profit_2$
No. of business units	2,614	2,418	3,443	1,809	2,994	2,501
No. of r's	16	13	18	14	18	14
Means observed r	.22	.15	.17	.12	.15	.67
Observed sd	.08	.14	.13	.16	.13	.25
p	.38	.22	.25	.16	.20	.76
SD_p	.00	.18	.15	.17	.14	.27
95% Cl	.31 to .44	.16 to .28	.20 to .30	.10 to .22	.15 to .24	.74 to .79
Note: p = True correlation corrected for independent and dependent variable measurement error; 95% Cl = 95% confidence interval of true correlation						
ER_2 = Employee Retention measured at Time 2 CL_2 = Customer Loyalty measured at Time 2 $Sales_2$ = Sales measured at Time 2 $Prof_2$ = Profit measured at Time 2						

Table 5 — Corrected Meta-Analytic Correlation Matrix					
	1	2	3	4	5
1. EE_1	**.80**				
2. ER_2	.26	**.52**			
3. CL_2	.31	.38	**.66**		
4. FIN_2	.19	.26	.19	**.93**	
5. EE_3	.63	.06	.14	.14	**.80**
Correlations corrected for test-retest reliability (reliabilities on diagonal in bold)					
EE_1 = Employee Engagement measured at Time 1 ER_2 = Employee Retention measured at Time 2 CL_2 = Customer Loyalty measured at Time 2 FIN_2 = Financials (Sales and Profit — equally weighted) measured at Time 2 EE_3 = Employee Engagement measured at Time 3					

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