

**Employee Engagement, Satisfaction, and
Business-Unit-Level Outcomes:
A Meta-Analysis**

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TABLE OF CONTENTS

SECTION	Page
Introduction.....	1
Background Behind the GWA	4
Meta-Analysis.....	9
Hypothesis and Study Characteristics	10
Meta-Analytic Methods Used.....	15
Results.....	22
Overall Satisfaction and Composite “Employee Engagement”	34
Utility Analysis: Practicality of the Effects	40
Discussion.....	44
References.....	47
Appendices.....	52

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Introduction

The quality of an organization's human resources is perhaps the leading indicator of its growth and sustainability. The attainment of a workplace with high-caliber employees starts with the selection of the right people for the right jobs. Numerous studies have documented the utility of valid selection instruments and systems in the selection of the right people (Hunter & Schmidt, 1983; Huselid, 1995; Schmidt, Hunter, McKenzie, & Muldrow, 1979; Schmidt & Rader, 1999). After employees have been selected, they make decisions and take actions every day that impact the success of their organizations. Many of these decisions and actions are influenced by their own internal motivations and drives. One can also hypothesize that the way employees are treated and the way they treat one another can positively affect their actions — or can place their organizations at risk. For example, researchers have found positive relationships between general workplace attitudes and service intentions, customer perceptions (Schmit & Allscheid, 1995), and individual performance outcomes (Iaffaldano & Muchinsky, 1985). An updated meta-analysis has revealed a substantial relationship between individual job satisfaction and individual performance (Judge, Thoresen, Bono, & Patton, 2001). Questions about the direction of causality in relationships between job satisfaction and performance have not been completely resolved, however. To date, the vast majority of job satisfaction research and subsequent meta-analyses have collected and studied data at the individual employee level.

There is also evidence at the workgroup or business-unit level that employee satisfaction, pride in service, and customer orientation relate to customer perceptions of service and other organizational outcomes (Ostroff, 1992; Reynierse & Harker, 1992; Schneider, 1991; Schneider,

Ashworth, Higgs, & Carr, 1996; Schneider & Bowen, 1992; Schneider, White, & Paul, 1998; Ulrich, Halbrook, Meder, Stuchlik, & Thorpe, 1991; Wiley, 1991). Mayer and Schoorman (1992) found that measures of trust correlate negatively with turnover and positively with performance. Convergently, The Gallup Organization (Gallup) has produced a journal (Fleming, 2000) highlighting numerous case studies that illustrate links between attitudinal variables and business outcomes. The units of measure for these analyses are both the individual and the business unit.

Even though it has been much more common to study employee opinion data at the individual level, studying data at the business-unit or workgroup level is critical, because that is where the data are typically reported (due to anonymity concerns, employee surveys are reported at a broader business-unit or workgroup level). In addition, business-unit-level research usually provides opportunities to establish links to outcomes that are directly relevant to most businesses — outcomes like customer loyalty, profitability, productivity, employee turnover, and safety variables that are often aggregated and reported at the business-unit level. Another advantage to reporting and studying data at the business-unit or workgroup level is that instrument item scores are as reliable as dimension scores are in individual-level analysis. This is because at the business-unit or workgroup level, each item score is an average of many individuals' scores. This means employee surveys reported at a business-unit or workgroup level can be more efficient, i.e., less dependent on length because item-level measurement error is less of a concern.

One potential problem with such business-unit-level studies is limited data, due to a limited number of business units (the number of business units becomes the sample size), or limited access to outcome measures that one can compare across business units. For this reason, many of these studies are limited in statistical power, and as such, results from individual studies may appear to conflict with one another. Meta-analysis techniques provide the opportunity to pool such studies together to get more precise estimates of the strength of effects and their generalizability.

This paper's purpose is to present the results of an updated meta-analysis of the relationship between employee workplace perceptions and business-unit outcomes, based on currently available data collected with Gallup clients. The focus of this study is on the thirteen (13) statements included in the Gallup Workplace Audit (GWA, i.e., the Q¹² and Overall Satisfaction). These 13 items — which were selected because of their importance at the business-unit or workgroup level — measure employee perceptions of the quality of people-related management practices in their business units. This report provides an update of previous research reported by Harter and Schmidt (2000), Harter, Schmidt, and Hayes (2002), and Harter and Schmidt (2002).

Background Behind the GWA

The history of the research and conceptual background of the GWA (Q¹²) instrument is detailed in Harter and Schmidt (2000) and Harter et al. (2002). In short, the GWA (Q¹²) was developed based on over 30 years of accumulated quantitative and qualitative research. Its reliability, convergent validity, and criterion-related validity have been extensively studied. It is an instrument validated through the above psychometric studies as well as practical considerations regarding its usefulness for managers in creating change in the workplace.

In designing the items included in the GWA, researchers took into account that, from an actionability standpoint, there are two broad categories of employee survey items: those that measure attitudinal outcomes (satisfaction, loyalty, pride, customer service intent, and intent to stay with the company) and those that measure actionable issues that drive the above outcomes. In our standard set of GWA items, we have included one outcome item (satisfaction with one's company) that can be seen as an overall measure of "satisfaction." Following the satisfaction item are 12 items measuring issues we have found to be actionable at the supervisor or manager level in the company — items measuring the extent to which employees are "engaged" in their work.

The 13 GWA statements are as follows:

- Q00. (Overall Satisfaction) On a five-point scale, where “5” is *extremely satisfied* and “1” is *extremely dissatisfied*, how satisfied are you with (name of company) as a place to work?
- Q01. I know what is expected of me at work.
- Q02. I have the materials and equipment I need to do my work right.
- Q03. At work, I have the opportunity to do what I do best every day.
- Q04. In the last seven days, I have received recognition or praise for doing good work.
- Q05. My supervisor, or someone at work, seems to care about me as a person.
- Q06. There is someone at work who encourages my development.
- Q07. At work, my opinions seem to count.
- Q08. The mission or purpose of my company makes me feel my job is important.
- Q09. My associates or fellow employees are committed to doing quality work.
- Q10. I have a best friend at work.
- Q11. In the last six months, someone at work has talked to me about my progress.
- Q12. This last year, I have had opportunities at work to learn and grow.

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The current standard is to ask each employee to rate the above statements (a census survey — median participation rate is 83%) using six response options (from 5=strongly agree to 1=strongly disagree; the sixth response option — don't know/does not apply — is unscored). Because it is a satisfaction item, the first item is scored on a satisfaction scale rather than on an agreement scale.

The reader will notice that, while these items measure issues that the manager or supervisor can influence, only one item contains the word “supervisor.” This is because it is realistic to assume that numerous people in the workplace can influence whether someone's expectations are clear, whether he or she feels cared about, and so on. The manager's or supervisor's position, however, allows the manager or supervisor to take the lead in establishing a culture that values behaviors that support these perceptions. The following is a brief discussion of the conceptual relevancy of each of the 13 items:

Q00. Overall Satisfaction. The first item on the survey measures an overall attitudinal outcome: satisfaction with one's company. One could argue that in and of itself, it is difficult to act on the results of this item. Other issues, like those measured in the following 12 items, explain why people are satisfied, and why they become engaged and affect outcomes.

Q01. Expectations. Defining and clarifying the outcomes that are to be achieved are perhaps the most basic of all employee needs and manager responsibilities. How these outcomes are defined and acted upon will vary from business unit to business unit, depending on the goals of the business unit.

Q02. Materials and equipment. Getting people what they need to do their work is important in maximizing efficiency, in demonstrating to employees that their work is valued, and in showing that the company is supporting them in what they are asked to do. Great managers keep this perception objective by helping

employees see how their requests for materials and equipment connect to important outcomes.

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Q03. *Opportunity to do what I do best.* Helping people get into roles where they can most fully use their natural abilities — their talents — is the ongoing work of great managers. Learning about individual differences through experience and assessment can help managers position people efficiently, within and across roles.

Q04. *Recognition for good work.* When managers ask employees who are performing at a high level whether they are suffering from too much recognition, they rarely, if ever, get affirmative responses. Another ongoing management challenge is to understand how each person prefers to be recognized, to make it objective and real by basing it on performance, and to do it frequently.

Q05. *Someone at work cares about me.* For each person, feeling “cared about” may mean something different. The best managers listen to individuals, and respond to their unique needs. In addition, they find the connection between the needs of the individual and those of the organization.

Q06. *Encourages my development.* How employees are coached can influence how they perceive their future. If the manager is helping the employee improve as an individual by providing opportunities that are in sync with the employee’s talents and strengths, both the employee and the company will profit.

Q07. *Opinions count.* Asking for the employee’s input, and considering that input as decisions are made, can often lead to better decisions. This is because employees are often closer than the manager is to individuals and variables that affect the overall system. In addition, when employees feel they are involved in decisions, they take greater ownership of the outcomes.

Q08. *Mission/Purpose.* Great managers often help people see not only the purpose of their work, but also how each person’s work influences and relates to the purpose of the organization and its outcomes. Reminding employees of the big-picture impact of what they do each day is important, whether it is how their work influences the customer, safety, or the public.

Q09. *Associates committed to quality.* Managers can influence the extent to which employees respect one another by selecting conscientious employees, providing some common goals and metrics around quality, and increasing associates’ frequency of opportunity for interaction.

Q10. *Best friend.* Managers vary in the extent to which they create opportunities for people at work to get to know one another, and in whether they value the importance of close, trusting relationships at work. The best managers do not subscribe to the idea that there should be no close friendships at work; instead,

they free people to get to know one another, which is a basic human need. This, then, can influence communication, trust, and other outcomes.

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Q11. *Progress*. Providing a structured time to discuss each employee's progress, achievements, goals, and so on, is important for both managers and employees. Great managers regularly meet with individuals, both to learn from them and to give them guidance. This give-and-take helps both managers and employees make better decisions.

Q12. *Learn and grow*. In addition to having a need to be recognized for good work, most employees have a need to know they are improving and have chances to improve themselves. Great managers pick training that will benefit the individual and the organization.

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As a total instrument (sum or mean of items 01-12), the GWA has a Cronbach's alpha of .91 at the business-unit level. The meta-analytic convergent validity of the equally weighted mean (or sum) of items 01-12 (GrandMean) to the equally weighted mean (or sum) of additional items in longer surveys (measuring all known facets of job satisfaction and engagement) is .91. This provides evidence that the GWA, as a composite measure, captures the general factor in longer employee surveys. Individual items correlate to their broader dimension true-score values, on average, at .69.

As mentioned, Harter et al. (2002) conducted an earlier version of this business-unit-level meta-analysis. The current meta-analysis includes a larger number of studies, business units, and industries represented. This meta-analysis also includes a much larger number of studies with safety as a dependent variable, and more studies from companies outside the United States (11 studies outside the U.S., including studies from the United Kingdom, Canada, Australia, Hong Kong, and Korea). This meta-analysis also includes updated estimates of reliabilities across

business units and includes all available Gallup studies (whether published or unpublished) and has no risk of publication bias.

Meta-Analysis

A meta-analysis is a statistical integration of data accumulated across many different studies. As such, it provides uniquely powerful information, because it controls for measurement and sampling errors and other idiosyncrasies that distort the results of individual studies. A meta-analysis eliminates biases and provides an estimate of true validity or true relationship between two or more variables. Statistics typically calculated during meta-analyses also allow the researcher to explore the presence, or lack thereof, of moderators of relationships. More than 1,000 meta-analyses have been conducted in the psychological, educational, behavioral, medical, and personnel selection fields. The research literature in the behavioral and social sciences includes a multitude of individual studies with apparently conflicting conclusions. Meta-analysis, however, allows the researcher to estimate the mean relationship between variables and make corrections for artifactual sources of variation in findings across studies. It provides a method by which researchers can determine whether validities and relationships generalize across various situations (e.g., across firms or geographical locations).

This paper will not provide a full review of meta-analysis. Rather, the authors encourage readers to consult the following sources for both background information and detailed descriptions of the more recent meta-analytic methods: Schmidt (1992); Hunter and Schmidt (1990); Lipsey and Wilson (1993); Bangert-Drowns (1986); and Schmidt, Hunter, Pearlman, and Rothstein-Hirsh (1985).

Hypothesis and Study Characteristics

The hypotheses examined for this meta-analysis are as follows:

Hypothesis 1: Business-unit-level employee satisfaction and engagement will have positive average correlations with the business-unit outcomes of customer loyalty, productivity, profitability, employee retention, and employee safety.

Hypothesis 2: The correlations between employee satisfaction and engagement and business-unit outcomes will generalize across organizations for all business-unit outcomes. That is, these correlations will not vary substantially across organizations, and in particular, there will be few if any organizations with zero or negative correlations.

A total of one hundred seven (107) studies for 82 independent companies are included in Gallup's inferential database — studies conducted as proprietary research for various organizations. In each GWA, one or more of the GWA items were used (as a part of standard policy, starting in 1997, all items were included in all studies), and data were aggregated at the business-unit level and correlated with the following aggregate business-unit performance measures:

- Customer metrics (referred to as customer loyalty)
- Profitability
- Productivity
- Turnover
- Safety

That is, in these analyses the unit of analysis was the business unit, not the individual employee.

Pearson correlations were calculated, estimating the relationship between business-unit average measures of employee perceptions and each of these five general business outcomes. Correlations were calculated across business units within each company, and these correlation coefficients were entered into a database for each of the 13 items. The researchers then

calculated mean validities, standard deviations of validities, and validity generalization statistics for each item for each of the five business-unit outcome measures.

Studies for the current meta-analysis were selected so that each company was represented once in each analysis. For several companies, multiple studies were conducted. In order to include the best possible information for each company represented in the study, some basic rules were used. If two concurrent studies were conducted for the same client (where GWA and outcome data were collected concurrently, i.e., in the same year), then the weighted average effect sizes across the multiple studies were entered as the value for that company. If a company had both a concurrent and a predictive study (where the GWA was collected in Year 1 and outcomes were tracked in Year 2), then the effect sizes from the predictive study were entered. If a company had multiple predictive studies, then the mean of the correlations in these studies was entered.

- For thirty-three (33) companies, there were studies that examined the relationship between business-unit employee perceptions and customer perceptions. Customer perceptions included customer metrics, patient metrics, and student ratings of teachers. These metrics included measures of loyalty, satisfaction, and engagement. The largest representation of studies included loyalty metrics (i.e., likelihood to recommend or repeat business), so we refer to customer metrics as customer loyalty in this study. Instruments varied from study to study. The general index of customer loyalty was an average score of the items included in each measure.
- Profitability studies were available for forty-four (44) companies. Definition of profitability typically was a percentage profit of revenue (sales). In several companies, the researchers used — as the best measure of profit — a difference score from the prior year or a difference from a budgeted amount, because it represented a more accurate measure of each unit's relative performance. As such, a control for opportunity was used when profitability figures were deemed less comparable from one unit to the next. For example, a difference variable involved dividing profit by revenue for a business unit and then subtracting a budgeted percentage from this percentage. In every case, profitability variables were measures of margin, and productivity variables (which follow) were measures of amount produced.

- Productivity studies were available for fifty (50) companies. Measures of business-unit productivity consisted of one of the following: financials (i.e., revenue/sales dollars per person or patient), quality (i.e., managerial evaluation of all available productivity measures), quantity produced, or student achievement scores. In a few cases, this was a dichotomous variable (top-performing business units = 2, less successful units = 1). As with profitability, in many cases it was necessary for the researchers to control the financial metrics for opportunity by comparing results to a performance goal or prior-year figure.
- Turnover data were available for thirty-eight (38) companies. The turnover measure was the annualized percentage of employee turnover for each business unit.
- Safety data were available for seventeen (17) companies. Safety measures included lost workday/time incident rate, percentage of workdays lost due to incidents or worker's compensation claims, number of incidents, or incident rates.

The overall study involved 410,225 independent employee responses to surveys and 13,751 independent business units in 82 companies, an average of 30 employees per business unit and 168 business units per company. One hundred seven (107) research studies were conducted across the 82 companies.

Table 1, which follows, provides a summary of studies (per company) sorted by industry type. It is evident that there is considerable variation in the industry types represented, as companies from 34 industries provided studies. Each of the general government industry classifications (via SIC codes) is represented, with the largest number of companies represented in services and retail industries. The largest number of business units is in transportation and public utilities, and retail. Of the specific industry classifications, Services – Health, Financial – Depository, and Services – Education are of highest frequency.

Table 1 — Summary of Studies by Industry

Industry Type	Number of		
	Companies	Business Units	Respondents
Consumer Production – Durables	1	87	5,532
Financial – Depository	8	2,218	29,349
Financial – Insurance	2	174	7,215
Financial – Nondepository	1	94	2,038
Financial – Security	3	86	2,785
Manufacturing – Cons. Products	1	59	265
Manufacturing – Food	3	110	3,047
Manufacturing – Industrial Equip.	1	88	639
Manufacturing – Instrument	2	20	267
Manufacturing – Paper	1	60	17,243
Manufacturing – Pharmaceutical	1	92	873
Manufacturing – Printing	1	14	420
Materials and Construction	1	190	15,535
Real Estate Investment Trusts	1	129	1,952
Retail – Automotive	1	80	1,384
Retail – Building Materials	2	793	43,763
Retail – Clothes	3	279	16,795
Retail – Department Stores	1	440	6,594
Retail – Eating	6	730	37,111
Retail – Electronics	2	508	33,405
Retail – Entertainment	1	106	1,051
Retail – Food	3	494	35,886
Retail – Miscellaneous	2	674	19,316
Services – Business	1	20	600
Services – Education	7	310	10,746
Services – Government	4	240	8,336
Services – Health	11	1,169	52,786
Services – Hospitality	1	30	2,612
Services – Hotels	3	167	6,549
Services – Recreation	1	14	288
Telecommunications	1	19	205
Transport./Public Util. – Trucking	1	96	6,213
Transport./Public Util. – Comm.	2	4,039	35,964
Transport./Public Util. – Electrical	2	122	3,461

- continued -

Table 1—Summary of Studies by Industry (continued)

Industry Type	Number of		
	Companies	Business Units	Respondents
Total Consumer Production	1	87	5,532
Total Financial	14	2,572	41,387
Total Manufacturing	10	443	22,754
Total Materials & Construction	1	190	15,535
Total Real Estate Investment Trusts	1	129	1,952
Total Retail	21	4,104	195,305
Total Services	28	1,950	81,917
Total Telecommunications	1	19	205
Total Transportation/Public Util.	5	4,257	45,638
Total	82	13,751	410,225

Table 2 provides a summary of studies (per company) sorted by business or operational unit type. There is also considerable variation in type of business unit, ranging from stores to plants/mills to departments to schools. Overall, 17 different types of business units are represented; the largest number of companies had studies of workgroups, stores, or bank branches. Likewise, workgroups, stores, and bank branches have the highest proportional representation of business/operating units.

Table 2 — Summary of Business/Operating-Unit Types

Business/Operating-Unit Type	Number of		
	Companies	Business Units	Respondents
Bank Branch	10	2,446	32,396
Call Center	1	17	179
Call Center Department	2	52	2,024
City Center Office	3	64	2,612
Dealership	1	80	1,384

- continued -

Table 2 — Summary of Business/Operating-Unit Types (continued)

Business/Operating- Unit Type	Number of		
	Companies	Business Units	Respondents
Dental Office	1	134	675
Distribution Center	1	7	2,353
Division	3	69	11,296
Hospital	2	220	25,903
Hotel	2	66	5,736
Plant/Mill	2	72	19,805
Region	1	96	6,213
Restaurant	5	367	21,103
Sales Team	3	123	1,256
School	6	296	10,496
Store	14	3,298	164,510
Workgroup	25	6,344	102,284
Total	82	13,751	410,225

Meta-Analytic Methods Used

Analyses included weighted average estimates of true validity, estimates of standard deviation of validities, and corrections made for sampling error, measurement error in the dependent variables, and range variation and restriction in the independent variable (GWA) for these validities. An additional analysis was conducted, correcting for independent-variable measurement error. The most basic form of meta-analysis corrects variance estimates only for sampling error. Other corrections recommended by Hunter and Schmidt (1990) include correction for measurement and statistical artifacts, such as range restriction and measurement error in the performance variables gathered. The definitions of the above procedures are provided in the sections that follow.

Gallup researchers gathered performance-variable data for multiple time periods to calculate the reliabilities of the business performance measures. Because these multiple measures were not available for each study, the researchers used artifact distributions meta-analysis methods (Hunter & Schmidt, 1990, pp. 158-197) to correct for measurement error in the performance variables. The artifact distributions developed were based on test-retest reliabilities, where they were available, from various studies. The procedure followed for calculation of business-unit outcome-measure reliabilities was consistent with Scenario 23 in Schmidt and Hunter (1996). To take into account that some change in outcomes (stability) is a function of real change, test-retest reliabilities were calculated using the following formula:

$$(r_{12} \times r_{23})/r_{13}$$

Where r_{12} is the correlation of the outcome measured at time 1 with the same outcome measured at time 2; r_{23} is the correlation of the outcome measured at time 2 with the outcome measured at time 3; and r_{13} is the correlation of the outcome measured at time 1 with the outcome measured at time 3.

The above formula factors out real change (which is more likely to occur from time period 1-3 than from time period 1-2 or 2-3) from random changes in business-unit results caused by measurement error, data-collection errors, sampling errors (primarily in customer measures), and uncontrollable fluctuations in outcome measures. Some estimates were available for quarterly data, some for semiannual data, and others for annual data. See Appendix A for a listing of the reliabilities used in the corrections for measurement error. Artifact distributions for reliability were collected for all dependent variables.

To adequately correct for item-level independent-variable measurement error, test-retest reliabilities (with a short time interval) would be necessary. Such estimates were unavailable at

the time of this study. It could be argued that, because the independent variable is used in practice to predict outcomes, the practitioner must live with the reliability of the instrument he/she is using. However, correcting for measurement error in the independent variable answers the theoretical question of how the actual constructs (true scores) relate to each other. Such corrections were not made for individual items, but were made for the composite indices of employee engagement and overall satisfaction. Appendix B presents the distributions of reliabilities for the two composite measures. These values were computed in the same manner as were those for the business-unit outcomes.

In correcting for range variation and range restriction, there are fundamental, theoretical questions that need to be considered relating to whether such correction is necessary. In personnel selection, validities are routinely corrected for range restriction because, in selecting applicants for jobs, those scoring highest on the predictor are typically selected. This results in explicit range restriction that biases observed correlations downward (i.e., attenuation). In the employee satisfaction and engagement arena, one could argue that there is no explicit range restriction because we are studying results as they exist in the workplace. Work units are not selected based on scores on the predictor (GWA scores). However, in studying companies, we have observed that there is variation across companies in standard deviations of indices across business units. There is also variation in mean scores across companies. One hypothesis for why this variation occurs is that companies vary in how they encourage employee satisfaction and engagement initiatives and in how they have or have not developed a common set of values and a common culture. Therefore, the standard deviation of the population of business units across organizations studied will be greater than the standard deviation within the typical company.

This variation in standard deviations across companies can be thought of as indirect range restriction (as opposed to direct range restriction). Improved indirect-range restriction corrections have been incorporated into this meta-analysis (Hunter, Schmidt, & Le, 2002).

In the past 3 years, Gallup has collected descriptive data on more than 3 million respondents, 285,314 business units or workgroups, and 290 companies. This accumulation of data indicates that the standard deviation within a given company is, on average, 75% of the standard deviation in the population of all business units. In addition, the ratio of standard deviation for a given company relative to the population value varies from company to company. Therefore, if one goal is to estimate the effect size in the population of all business units (arguably a theoretically important issue), then correction should be made based on such available data. In the observed data, correlations are attenuated for companies with less variability across business units than the population average, and vice versa. As such, variability in standard deviations across companies will create variability in observed correlations and is therefore an artifact that can be corrected for in interpreting the generalizability of validities. Appendices in Harter and Schmidt (2000) provided artifact distributions for range-restriction/variation corrections used for meta-analysis. These artifact distributions have since been updated substantially. Due to the increased size of these tables, they are not included in this report. They resemble those reported in the earlier study, but with a larger number of entries.

The following excerpt provides an overview of meta-analysis conducted using artifact distributions:

In any given meta-analysis, there may be several artifacts for which artifact information is only sporadically available. For example, suppose measurement error and range restriction are the only relevant artifacts beyond sampling error. In such a case, the typical artifact distribution-based meta-analysis is conducted in three stages:

- First, information is compiled on four distributions: the distribution of the observed correlations, the distribution of the reliability of the independent variable, the distribution of the reliability of the dependent variable, and the distribution of the range departure. There are then four means and four variances compiled from the set of studies, with each study providing whatever information it contains.
- Second, the distribution of observed correlations is corrected for sampling error.
- Third, the distribution corrected for sampling error is then corrected for error of measurement and range variation (Hunter & Schmidt, 1990, pp. 158-159).

In this study, statistics are calculated and reported at each level of analysis, starting with the observed correlations and then correcting for sampling error, measurement error, and, finally, range variation. While within-company range-variation corrections are provided (to correct validity generalization estimates) in all analyses (items and overall indices), between-company range-restriction corrections were made only when studying overall indices (overall satisfaction and employee engagement, i.e., GrandMean of items 01-12). Again, range-restriction corrections may not be needed for understanding and applying item-level results within a single company. But these corrections are relevant in understanding how satisfaction and engagement relate to performance across the business units of all companies. As alluded to, we have applied the indirect range-restriction correction procedure to this meta-analysis (Hunter et al., 2002). As noted earlier, corrections were made for measurement error in the independent variable for overall composite indices (as an additional analysis).

The meta-analysis for each item and each performance variable includes an estimate of the mean sample-size-weighted validity and the variance across the correlations — again weighting each validity by its sample size. The amount of variance predicted for weighted correlations on the basis of sampling error was also computed. The following is the formula to calculate variance expected from sampling error in "bare bones" meta-analyses, using the Hunter/Schmidt technique referred to on the previous page:

$$s_e^2 = (1 - \bar{r}^2)^2 / (\bar{N} - 1)$$

Residual standard deviations were calculated by subtracting the amount of variance due to sampling error, the amount of variance due to study differences in measurement error in the dependent variable, and the amount of variance due to study differences in range variation from the observed variance. To estimate the true validity standard deviations, the residual standard deviation was adjusted for bias due to mean unreliability and mean range restriction. The amount of variance due to sampling error, measurement error, and range variation was divided by the observed variance to calculate the total percentage variance accounted for. One rule of thumb adopted from the literature is that, if over 75% of variance in validities across studies is due to sampling error and other artifacts, the validity is assumed generalizable.

As in Harter et al. (2002), we calculated the correlation of overall satisfaction and engagement to composite performance. This calculation assumes managers are managing toward multiple outcomes simultaneously and that each outcome occupies some space in the overall evaluation of performance. To calculate the correlation to the composite index of performance, we used the

Mosier (1943) formula to determine the reliability of the composite measure (as described in Harter et al. 2002), with updated reliability distributions and updated intercorrelations of the outcome measures. In addition, given a large increase in number of studies with safety as an outcome, and estimates of the correlation of safety to other outcomes, we added safety to the composite performance definition. The reliability of the composite metric is .94. Composite performance was measured as the equally weighted sum of customer loyalty, turnover (reverse scored as retention), safety (accidents reverse scored), and financials (with profitability and productivity equally weighted). We also calculated composite performance as the equally weighted sum of the most direct outcomes of engagement — customer loyalty, turnover (reverse scored as retention), and safety (accidents reverse scored). The reliability of this composite variable is .69.

Results

The results of the item-level meta-analyses for the 12 actionable GWA items (Q01-Q12) are provided in Tables 3-7. Meta-analyses for overall and composite indices (overall satisfaction and the GrandMean of the 12 GWA items) are provided in Table 9. Tables 10 and 11 provide correlations and d values (differences in standard score units between high- and low-scoring business units on engagement and satisfaction) for composite indices in relation to composite performance.

Table 3 provides a meta-analysis for each of the 12 actionable items with regard to customer loyalty criteria. Statistics presented include the number of business units contained in the analysis, the number of correlations, the weighted mean observed correlation, the observed standard deviation, the true validity correlation, the true validity standard deviation (subtracting out variance due to sampling error, measurement error in the performance variables, and range variation), the percentage variance due to sampling error, the percentage variance accounted for, and the 90% credibility value (the point above which 90% of the true validities fall).

Results indicate that, across all 12 items, true validity estimates are in the positive direction. True validity estimates range from a low of .15 to a high of .22. If an item has a positive 90% credibility value, it is considered generalizable in the sense that we are confident the true validity is positive (in the hypothesized direction). Items in which over 75% of the variance in validities was accounted for are considered generalizable in the sense that the validity does not vary (or if it does vary, the variance is very slight) across studies. All 12 items have positive 90%

credibility values and 11 have over 75% of the variance in validities accounted for due to artifacts. As such,

the relationship of the 12 GWA items to customer loyalty criteria is widely generalizable across organizations.

Interestingly, for three items ("I have a best friend at work," "I know what is expected of me at work," and "At work, my opinions seem to count"), the calculations indicate that, respectively, 160%, 148%, and 132% of the variance in validities across studies is due to sampling error and other artifacts. The interpretation of this is as follows: By chance there is less variability across studies in this data set in the observed correlations than was predicted from random sampling error and other artifacts. Five other items also have over 100% of variance accounted for due to sampling error and other artifacts.

When multiple generalizability estimates are derived, second-order sampling error can slightly influence results. To compute the mean percentage variance accounted for, the following formula (Hunter & Schmidt, 1990, p. 421) was used:

$$\% \text{Variance acct for} = 1 / (\sum (1/\% \text{Var})) / K$$

On average, 103.54% of the variance is accounted for due to all observable artifacts. Therefore, effect sizes across companies appear to be identical after correcting for second-order sampling error. Although 103.54% is still larger than 100%, the numerical difference between 103.54% and 100% of variance is very small, as expected.

Table 3
Meta-Analysis and Validity Generalization Statistics
for 12 CORE GWA ITEMS—Correlations to Customer Loyalty Criteria

<u>Item</u>	No. of Business Units	No. of r's	Mean Observ. r's	Observ. SD	True Validity r	True Validity SD	% Variance		90% CV
							Sampling Error	Accounted for	
1) Know what is expected	4,337	32	.13	.09	.16	.00	100	148	.16
2) Materials and equipment	4,374	33	.18	.11	.22	.00	64	110	.22
3) Opp. to do what I do best	4,337	32	.16	.10	.19	.00	74	119	.19
4) Recognition/praise	4,374	33	.12	.10	.15	.03	73	96	.11
5) Cares about me	4,345	32	.15	.10	.18	.00	69	106	.18
6) Encourages development	4,337	32	.15	.09	.19	.00	82	118	.19
7) Opinions count	4,337	32	.12	.08	.15	.00	102	132	.15
8) Mission/purpose	4,261	30	.15	.12	.19	.07	51	78	.11
9) Committed — quality	4,337	32	.16	.14	.20	.11	39	59	.06
10) Best friend	4,374	33	.13	.08	.16	.00	113	160	.16
11) Talked about progress	4,337	32	.12	.10	.15	.02	76	98	.12
12) Opps. to learn and grow	4,337	32	.14	.10	.18	.00	76	105	.18
							Mean:	70.7	103.54

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Table 4 provides the same analysis for each item with regard to its relationship to profitability criteria. Eleven (11) of the 12 items have positive 90% credibility values, and it is possible to account for over 75% of the variance in validities for 10 items. The mean percentage variance accounted for across items is 93.72% when all available artifacts are corrected for. Again, effect sizes appear to be consistent across organizations. True validity values range from .06 to .12, smaller values than the correlations to customer loyalty criteria. One possible reason for this is that profitability may be a more indirect result of “employee engagement” than is customer loyalty. That is, employee attitudes and behaviors directly influence customer reactions and, hence, affect customer loyalty. But employee attitudes affect profitability more indirectly. Also, profitability is affected by a larger number of causes (e.g., economic conditions, interest rates) than is customer loyalty. The causal ordering of the variables in this study has been explored, indicating direct causal paths from employee engagement to customer loyalty and turnover and direct and indirect paths from employee engagement to financials (Harter, Schmidt, Asplund, & Killham, 2003).

Table 4
Meta-Analysis and Validity Generalization Statistics
for 12 CORE GWA ITEMS—Correlations to Profitability Criteria

<u>Item</u>	No. of Business Units	No. of r's	Mean Observ. r's	Observ. SD	True Validity r	True Validity SD	% Variance		90% CV	
							Sampling Error	Accounted for		
1) Know what is expected	5,969	43	.08	.11	.09	.07	55	65	-.01	
2) Materials and equipment	5,900	43	.11	.12	.12	.07	54	69	.03	
3) Opp. to do what I do best	5,889	42	.10	.09	.11	.00	81	102	.11	
4) Recognition/praise	5,900	43	.06	.09	.06	.00	102	109	.06	
5) Cares about me	5,976	43	.07	.09	.07	.02	88	97	.05	
6) Encourages development	5,863	42	.08	.08	.08	.00	108	120	.08	
7) Opinions count	5,863	42	.09	.08	.10	.00	104	121	.10	
8) Mission/purpose	5,571	38	.10	.09	.11	.02	78	94	.08	
9) Committed — quality	5,863	42	.11	.10	.12	.01	79	99	.11	
10) Best friend	5,296	43	.06	.09	.06	.02	87	94	.03	
11) Talked about progress	5,863	42	.09	.10	.09	.04	73	83	.04	
12) Opps. to learn and grow	5,863	42	.09	.09	.10	.00	98	113	.10	
							Mean:	80.02	93.72	

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Table 5 provides the meta-analytic and validity generalization statistics for the 12 actionable GWA items relative to productivity criteria. Again, true validities are all positive, ranging from .06 to .15. Eleven (11) of the 12 items have positive 90% credibility values, and over 75% of the variance in validities is accounted for in the same 11 items. The mean percentage variance accounted for across items is 107.83% (for all available artifacts), suggesting no room for possible moderators within items at the company level. There is slight variation across items, however, in the magnitude of true validity and 90% credibility value estimates.

Table 5
Meta-Analysis and Validity Generalization Statistics
for 12 CORE GWA ITEMS—Correlations to Productivity Criteria

<u>Item</u>	<u>No. of Business Units</u>	<u>No. of r's</u>	<u>Mean Observ. r's</u>	<u>Observ. SD</u>	<u>True Validity r</u>	<u>True Validity SD</u>	<u>% Variance</u>		<u>90% CV</u>
							<u>Sampling Error</u>	<u>Accounted for</u>	
1) Know what is expected	5,582	47	.13	.10	.14	.00	81	114	.14
2) Materials and equipment	5,597	46	.12	.11	.13	.04	69	90	.08
3) Opp. to do what I do best	5,574	46	.14	.10	.15	.00	84	118	.15
4) Recognition/praise	5,597	46	.11	.09	.12	.00	95	117	.12
5) Cares about me	5,619	48	.11	.08	.12	.00	131	164	.12
6) Encourages development	5,574	46	.12	.08	.12	.00	115	138	.12
7) Opinions count	5,560	45	.13	.09	.14	.00	110	144	.14
8) Mission/purpose	5,344	42	.14	.10	.14	.00	86	113	.14
9) Committed — quality	5,678	46	.12	.11	.13	.05	64	81	.07
10) Best friend	5,611	47	.06	.11	.06	.06	65	70	-.02
11) Talked about progress	5,574	46	.11	.10	.12	.02	80	96	.09
12) Opps. to learn and grow	5,560	45	.12	.09	.13	.00	98	122	.13
							Mean:	85.70	107.83

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Table 6 includes the meta-analytic and validity generalization statistics for each item as they relate to turnover. All twelve (12) items have negative true validity values (higher scores associated with lower turnover) and all 12 have zero or negative 90% credibility values. Therefore, for all items, we can be quite certain the direction of the relationship is negative (as hypothesized for turnover) across the organizations we have studied. That is, higher employee engagement scores predict lower turnover levels. We are able to account for over 75% of the variance in validities for 10 items. The mean percentage variance accounted for across items is 99.70% (for all available artifacts), again suggesting generalizable effects across companies and no room for moderators.

Table 6
Meta-Analysis and Validity Generalization Statistics
for 12 CORE GWA ITEMS—Correlations to Turnover Criteria

<u>Item</u>	<u>No. of Business Units</u>	<u>No. of r's</u>	<u>Mean Observ. r's</u>	<u>Observ. SD</u>	<u>True Validity r</u>	<u>True Validity SD</u>	<u>% Variable</u>		<u>90% CV</u>
							<u>Sampling Error</u>	<u>Accounted for</u>	
1) Know what is expected	9,099	35	-.10	.07	-.15	.00	81	137	-.15
2) Materials and equipment	9,414	36	-.11	.07	-.16	.00	73	125	-.16
3) Opp. to do what I do best	9,419	36	-.13	.06	-.18	.00	101	199	-.18
4) Recognition/praise	9,414	36	-.06	.08	-.09	.07	56	68	.00
5) Cares about me	9,310	34	-.10	.07	-.15	.00	69	114	-.15
6) Encourages development	9,414	36	-.09	.08	-.13	.05	58	80	-.06
7) Opinions count	9,414	36	-.10	.08	-.14	.03	62	93	-.10
8) Mission/purpose	9,202	33	-.10	.07	-.14	.01	65	99	-.13
9) Committed — quality	9,414	36	-.12	.07	-.18	.00	76	133	-.18
10) Best friend	9,414	36	-.07	.09	-.11	.08	47	63	-.01
11) Talked about progress	9,414	36	-.09	.08	-.13	.05	58	81	-.06
12) Opps. to learn and grow	9,414	36	-.11	.07	-.16	.00	81	134	-.16
							Mean:	66.43	99.70

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Table 7 presents meta-analytic and validity generalization statistics for the safety variable, which is particularly relevant to industrial and manufacturing companies. Safety, as defined by lost workdays due to injury and injury rate, was available for 15 studies and 1,490 business units. This represents a substantial increase from the previous research reported by Harter et al. (2002). All items show negative true validities (higher scores associated with lower number of incidents and days missed as a result of these incidents) and all 12 have negative 90% credibility values. True validities range from -.14 to -.31. Therefore, we can again be certain of a negative relationship (as hypothesized for safety) for all items. We are able to account for 75% of the variance in validities for all 12 items. The mean percentage variance accounted for across items is 120.11% when we correct for all available artifacts.

Table 7
Meta-Analysis and Validity Generalization Statistics
for 12 CORE GWA ITEMS—Correlations to Safety Criteria

<u>Item</u>	<u>No. of Business Units</u>	<u>No. of r's</u>	<u>Mean Observ. r's</u>	<u>Observ. SD</u>	<u>True Validity r</u>	<u>True Validity SD</u>	<u>% Variable</u>		<u>90% CV</u>
							<u>Sampling Error</u>	<u>Accounted for</u>	
1) Know what is expected	1,490	15	-.13	.09	-.16	.00	116	150	-.16
2) Materials and equipment	1,490	15	-.16	.11	-.20	.00	88	120	-.20
3) Opp. to do what I do best	1,490	15	-.19	.08	-.24	.00	166	255	-.24
4) Recognition/praise	1,490	15	-.13	.10	-.16	.00	98	120	-.16
5) Cares about me	1,490	15	-.14	.09	-.17	.00	137	178	-.17
6) Encourages development	1,490	15	-.17	.10	-.21	.00	108	141	-.21
7) Opinions count	1,490	15	-.16	.12	-.20	.03	72	95	-.16
8) Mission/purpose	1,490	15	-.18	.12	-.23	.00	73	100	-.23
9) Committed — quality	1,490	15	-.25	.12	-.31	.01	61	99	-.30
10) Best friend	1,490	15	-.11	.12	-.14	.06	70	84	-.06
11) Talked about progress	1,490	15	-.15	.10	-.19	.00	97	124	-.19
12) Opps. to learn and grow	1,490	15	-.13	.11	-.16	.00	90	107	-.16
						Mean:	90.59	120.11	

The Q¹² items are protected by copyright of The Gallup Organization, 1992-1999.

Table 8 provides a summary of the items that have positive 90% credibility values (zero or negative for the turnover and safety measures) and in which over 75% of the variance in validities is accounted for. As is shown in Tables 1-7, all items have relationships to all outcomes that are in the hypothesized direction. As is shown in Table 8, nearly all of these relationships are generalizable. In fact, 90% of the effects studied in the item-level meta-analysis meet generalizability criteria. It is possible that those that do not are merely a function of second-order sampling error, because second-order sampling error analyses indicate high generalizability.

Table 8
Items With Meta-Analytic r's
That Are Generalizable Across Organizations

<u>Item</u>	<u>Customer</u>	<u>Profitability</u>	<u>Productivity</u>	<u>Turnover</u>	<u>Safety</u>
1) Know what is expected	x		x	x	x
2) Materials and equipment	x		x	x	x
3) Opp. to do what I do best	x	x	x	x	x
4) Recognition/praise	x	x	x		x
5) Cares about me	x	x	x	x	x
6) Encourages development	x	x	x	x	x
7) Opinions count	x	x	x	x	x
8) Mission/purpose	x	x	x	x	x
9) Committed — quality		x	x	x	x
10) Best friend	x	x			x
11) Talked about progress	x	x	x	x	x
12) Opps. to learn and grow	x	x	x	x	x

The Q¹² items are protected by copyright of The Gallup Organization, 1992-1999.

Overall Satisfaction and Composite “Employee Engagement”

For purposes of overall evaluation of business units and for general theory building, it is useful to study composite measures of the satisfaction/engagement facets. That is, one general, global perception studied is “overall satisfaction with one’s company” (defined by one item) and another is “overall employee engagement in one’s work” (which is defined as the GrandMean of the GWA items 01-12). Table 9 provides meta-analytic and validity generalization statistics for both of these “overall” indices, overall satisfaction (OS) and the GrandMean (GM) of items 01-12, the latter of which is a composite measure of employee engagement.

Because these “overall” indices lend themselves to general, theoretical inquiry, an additional correction for range restriction in the independent variable across companies was made to meta-analytic estimates. Estimates that include this range-restriction correction apply to interpretations of effects in business units across companies, as opposed to effects expected within a given company. Because there is more variation in business units across companies than there is within the average company, effect sizes are higher when true validity estimates are calculated for business units across companies.

For instance, observe the estimates relative to the customer loyalty criteria. Without the between-company range-restriction correction (which is relevant to the effect within the typical company), the true validity value of overall satisfaction is .22 with a 90% CV of .18. With the between-company range-restriction correction (which is relevant to business units across companies), the true validity value of overall satisfaction is .31 with a 90% CV of .26. For employee engagement, the true validity is the same as the 90% CV, which is .22 within a given company and .32 for business units

across companies. Both OS and GM show generalizability across companies in their relationship to customer loyalty metrics, profitability, productivity, employee turnover, and safety outcomes. For all variables except safety, GM demonstrates slightly more generalizability across companies than does OS. Average effect sizes are of similar magnitude for these two “overall” measures.

In summary, for the overall measures of engagement shown in Table 9, the strongest effects are found relative to customer loyalty metrics, employee turnover, and safety. Correlations are positive and generalizable relative to profitability and productivity (often defined as sales) criteria, but of lower magnitude. This may be because profitability and other financial variables are influenced indirectly by employee engagement and more directly by the customer, employee turnover, and safety. The next section will explore the practical utility of the observed relationships.

Table 9
Composite Indices (Overall Sat. and GWA GrandMean) — Meta-Analysis

	<u>Customer</u>		<u>Profitability</u>		<u>Productivity</u>		<u>Turnover</u>		<u>Safety</u>	
	<u>OS</u>	<u>GM</u>	<u>OS</u>	<u>GM</u>	<u>OS</u>	<u>GM</u>	<u>OS</u>	<u>GM</u>	<u>OS</u>	<u>GM</u>
Number of Bus. Units	4169	4697	5658	6006	5300	5717	9135	9836	1490	1609
Number of r's	30	33	39	44	42	50	33	38	15	17
Mean Observed r	.17	.19	.13	.11	.15	.15	-.15	-.13	-.20	-.19
Observed SD	.11	.09	.10	.09	.11	.10	.09	.07	.10	.10
True Validity ¹	.22	.22	.14	.12	.16	.16	-.21	-.20	-.26	-.24
True Validity SD ¹	.03	.00	.05	.00	.03	.00	.05	.00	.00	.00
True Validity ²	.31	.32	.20	.17	.24	.23	-.30	-.27	-.36	-.34
True Validity SD ²	.04	.00	.06	.00	.04	.00	.06	.00	.00	.00
% Variance Acct'ed For-- Sampling error	58	86	63	98	66	87	40	79	91	94
%Variance Acct'ed For ¹	94	133	83	116	94	112	87	138	135	125
% Variance Acct'ed For ²	94	133	84	116	94	112	87	138	135	125
90% CV ¹	.18	.22	.08	.12	.13	.16	-.15	-.20	-.26	-.24
90% CV ²	.26	.32	.11	.17	.19	.23	-.22	-.27	-.36	-.34

OS = Overall Satisfaction

GM = GrandMean of GWA items 01-12 (employee engagement)

SD = Standard Deviation

¹ Includes correction for range variation within companies and dependent-variable measurement error

² Includes correction for range restriction across population of business units and dependent-variable measurement error

As in Harter et al. (2002), we calculated the correlation of overall satisfaction and employee engagement to composite performance. As defined earlier, Table 10 provides the correlations and d-values for four analyses: the observed correlations, correction for dependent-variable measurement error, correction for dependent-variable measurement error and range restriction

across companies, and correction for dependent-variable measurement error, range restriction, and independent-variable measurement error (true score correlation).

The effect sizes presented in Table 10 indicate very similar correlations of overall satisfaction and employee engagement to composite performance. Regression analyses (Harter et al., 2002) indicate that employee engagement accounts for nearly all of the performance-related variance (composite performance) accounted for by the overall satisfaction measure.

Table 10
Correlation of Employee Satisfaction and Engagement
to Composite Business-Unit Performance

<u>Analysis</u>	<u>Satisfaction</u>	<u>Engagement</u>
Observed r	.27	.26
D	.46	.43
r corrected for dependent-variable measurement error	.28	.27
D	.46	.44
r corrected for dependent-variable measurement error and range restriction across companies	.38	.38
D	.64	.64
ρ corrected for dependent-variable measurement error, range restriction, and independent-variable measurement error	.43	.43
δ	.73	.73

Business units in the top half on engagement within companies have over .4 standard deviation units' higher composite performance in comparison to those in the bottom half on engagement.

Across companies, business units in the top half on engagement have over .6 standard deviation units' higher composite performance in comparison to those in the bottom half on engagement.

Theoretically, after correcting for all available study artifacts, business units in the top half on employee engagement have over .7 standard deviation units' higher composite performance in comparison to those in the bottom half on engagement. This is the true score effect expected over time, across all business units.

As alluded to, some outcomes are the direct consequence of employee engagement (i.e., employee turnover, customer loyalty, and safety), and other outcomes are a more downstream result of intermediary outcomes (i.e., sales and profit). For this reason, we have also calculated the composite correlation to short-term outcomes. Table 11 again indicates similar relationships of satisfaction and engagement to composite performance. Observed correlations and d-values are of the same magnitude as those reported in Table 10, but corrected correlations are higher.

Business units in the top half on engagement within companies have one-half standard deviation higher performance on direct outcomes in comparison to those in the bottom half. Across companies, the difference is approximately three-fourths of a standard deviation. After correcting for all available artifacts, the difference is .87 standard deviation units.

Table 11
Correlation of Employee Satisfaction and Engagement
to Composite Business-Unit Performance —
Direct Outcomes (Turnover, Customer, Safety)

<u>Analysis</u>	<u>Satisfaction</u>	<u>Engagement</u>
Observed r	.26	.26
d	.43	.43
r corrected for dependent-variable measurement error	.31	.31
d	.51	.51
r corrected for dependent-variable measurement error and range restriction across companies	.43	.45
d	.73	.77
ρ corrected for dependent-variable measurement error, range restriction, and independent-variable measurement error	.50	.50
δ	.87	.87

Utility Analysis: Practicality of the Effects

In the past, studies of job satisfaction's relationship to performance have had limited analysis of the utility of the reported relationships. Correlations have often been discounted as trivial without an effort to understand the potential utility, in practice, of the relationships. The GWA includes items Gallup researchers have found to be influenceable by the local manager. As such, understanding the practical utility of potential changes is critical.

In examining the practical utility of the relationships observed in this study, we remind the reader that item-level correlations presented in this paper are underestimates of true score relationships because two psychometric measurement artifacts have not yet been corrected for (i.e., independent-variable reliability and between-company range restriction). For overall satisfaction (OS) and employee engagement (GM composite), which have more theoretical appeal, additional corrections were made for range restriction and independent-variable measurement error (as seen in Table 10).

The research literature includes a great deal of evidence that numerically small or moderate effects often translate into large practical effects (Abelson, 1985; Carver, 1975; Lipsey, 1990; Rosenthal & Rubin, 1982; Sechrest & Yeaton, 1982). As shown in Table 12, this is, in fact, the case here. Effect sizes referenced in this study are consistent with or above other practical effect sizes referenced in other reviews (Lipsey & Wilson, 1993).

A more intuitive method of displaying the practical value of an effect is that of binomial effect size displays, or BESDs (Grissom, 1994; Rosenthal & Rubin, 1982). BESDs typically depict the success rate of a treatment versus a control group as a percentage above the median on the outcome variable of interest.

BESDs can be applied to results of this study. Table 12 provides the percentage of business units above the median on the outcomes of interest for high- and low-scoring business units on the employee engagement (GM) composite measure. True validity estimates (correcting for measurement error only in the dependent variable) were used for analysis of business units **both** within companies and across companies.

Table 12
BESDs for GWA Dimensions
Sum of the 12 Items

<u>Employee Measure</u>	<u>Business Units Within Company</u>	<u>Business Units Across Companies</u>
	<u>% Above Median on Customer Loyalty Metrics</u>	
Top Half	61%	65%
Bottom Half	39%	35%
	<u>% Above Median on Profitability</u>	
Top Half	56%	59%
Bottom Half	44%	41%
	<u>% Above Median on Productivity</u>	
Top Half	58%	62%
Bottom Half	42%	38%
	<u>% Below Median on Turnover</u>	
Top Half	60%	64%
Bottom Half	40%	36%
	<u>% Below Median on Safety Incidents</u>	
Top Half	62%	67%
Bottom Half	38%	33%
	<u>% Above Median on Composite Performance (Total)</u>	
Top Half	64%	69%
Bottom Half	36	31%
	<u>% Above Median on Composite Performance (Direct Outcomes)</u>	
Top Half	66%	73%
Bottom Half	34	27%

One can see from Table 12 that there are meaningful differences between the top and bottom halves; again, the top half is defined as the average of business units scoring in the highest 50% on the GM, and business units scoring in the bottom half comprise the lowest 50%. It is clear from Table 12 that management would learn a great deal more about success if it studied what was going on within top-half business units rather than bottom-half units. Within companies, business units in the top half on employee engagement had, on average, a 56% higher success rate on customer loyalty metrics [i.e., $(61\% - 39\%)/39\% = 56.4\%$], a 50% higher success rate on turnover (lower probability of turnover), a 38% higher success rate on productivity outcomes, and a 27% higher success rate on profitability. For the safety variable, business units in the top half on employee engagement had, on average, a 63% higher success rate (lower probability of injuries or lost workdays). For business units across companies, those in the top half on employee engagement had, on average, an 86% higher success rate on customer metrics, a 78% higher success rate on turnover (lower probability of turnover), a 63% higher success rate on productivity outcomes, a 44% higher success rate on profitability outcomes, and a 103% higher success rate on safety (lower probability of injuries or lost workdays).

Other forms of expressing the practical meaning behind the effects from this study include utility analysis methods (Schmidt & Rauschenberger, 1986). Formulas have been derived for estimating the dollar-value increases in output as a result of improved employee selection. These formulas can be used in estimating the difference in performance outcomes at different levels in the distribution of GWA scores. Previous studies (Harter & Schmidt, 2000 and Harter et al., 2002) provided utility analysis examples, comparing differences in outcomes between the top and bottom quartiles on the 12-item overall GWA composite (GM). For companies included in this

meta-analysis, it is typical to see differences between top and bottom engagement quartiles of 2-4 points on customer loyalty, 1-4 points on profitability, hundreds of thousands of dollars on productivity figures per month, and 4-10 points in turnover for low-turnover companies and 15-50 points for high-turnover companies. Such differences and their utility in dollar terms should be calculated for each company, given the company's unique metrics, situation, and distribution of outcomes across business units.

One can see that the above relationships are nontrivial if the business has many business units. The point of the utility analysis, consistent with literature that has taken a serious look at utility, is that the relationship between employee engagement and business outcomes, even conservatively expressed, is meaningful from a practical perspective.

Discussion

Findings reported in this updated meta-analysis provide cross-validation to prior meta-analyses conducted on the GWA instrument. The relationship between engagement and performance (at the business-unit level) is substantial. There is evidence from this and other studies to suggest direction of causality. The studies in this updated meta-analysis include predictive data, with performance outcomes trailing the GWA measurement. Across studies, correlations of GWA items and overall indices with outcomes were widely generalizable, with variance in correlations attributable to sampling error and other artifacts. Consequently, the design of the study (predictive versus concurrent) was not considered as a moderator of the effect sizes. Evidence of directionality (through multiple time periods and path analysis) can be seen in individual case studies provided in *The Gallup Research Journal* (Fleming, 2000) and more recently, in a path analysis study of meta-analytic cross-lag effects (Harter et al., 2003). These studies have indicated a directional relationship from employee engagement to outcomes such as employee retention and customer loyalty/engagement, and a directional and somewhat reciprocal relationship between engagement and financials. 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).

The most convincing causal evidence comes, not from one study, but from a body of research and a multitude of types of evidence, including qualitative analysis of high-performing business units, path analysis, predictive studies, and studies of change over time. Such individual studies are a part of Gallup's past and ongoing workplace management research practice.

It is also worth noting that, as Gallup consultants have educated managers and partnered with companies on change initiatives, companies have experienced (between the first and second years), on average, one-half standard deviation growth on employee engagement, and often a full standard deviation growth and more after 3 or more years. A very important element in the utility of any applied instrument and improvement process is the extent to which the variable under study can be changed. Our current evidence is that employee engagement is changeable, and varies widely by business unit or workgroup.

In addition, work has been done showing that, at the individual level, employee satisfaction is at least somewhat trait related (Arvey, Bouchard, Segal, & Abraham, 1989; Bouchard, 1997). In the present analysis, for business units, we have averaged the independent variable across individuals, which makes our measure more a measure of business-unit performance-related culture rather than of individual employee traits or trait-related satisfaction. In averaging across individuals, we average out trait-related variations, producing a score that reflects the culture of the business unit.

Studies — both completed and in progress at Gallup — examining the relationship between changes in GWA scores and changes in business outcomes add to the causal evidence of the relationship between business-unit-level satisfaction/engagement and business-unit results.

The authors conclude from this study, as with prior Gallup studies, that employee perceptions, as measured by GWA items, relate to meaningful business outcomes, and that these relationships

can be generalized across companies. The relationships observed are in the directions hypothesized and make psychological sense. Inferences of causality will depend on various pieces of evidence (outlined above) that are collected on an ongoing basis by Gallup researchers and client partner researchers. In addition, future research published in academic journals may help to shed additional light on the question of causality. Clearly, there are differences across business units in the way employees perceive their work environments, and these differences relate to differences in performance. Such differences represent substantial utility to businesses and other organizations.

References

Abelson, R. P. (1985). A variance explanation paradox: When a little is a lot. *Psychological Bulletin*, *97*, 129-133.

Arvey, R. D., Bouchard, T. J., Jr., Segal, N. L., & Abraham, L. M. (1989). Job satisfaction: Environmental and genetic components. *Journal of Applied Psychology*, *74*, 187-192.

Bangert-Drowns, R. L. (1986). Review of developments in meta-analytic method. *Psychological Bulletin*, *99*(3), 388-399.

Bouchard, T. J., Jr. (1997). Genetic influence on mental abilities, personality, vocational interests, and work attitudes. Chapter 9 in *Internal Review of Industrial and Organizational Psychology*, *12*, 373-395. John Wiley & Sons Ltd.

Carver, R. P. (1975). The Coleman Report: Using inappropriately designed achievement tests. *American Educational Research Journal*, *12*, 77-86.

Fleming, J. H. (Ed.). Linkage analysis [Special issue]. (2000). *The Gallup Research Journal*, *3*(1).

The Gallup Organization (1992-1999). *Gallup Workplace Audit* (Copyright Registration Certificate TX-5 080 066). Washington, DC: U.S. Copyright Office.

Grissom, R. J. (1994). Probability of the superior outcome of one treatment over another. *Journal of Applied Psychology*, *79*(2), 314-316.

Harter, J. K., & Schmidt, F. L. (2000). *Validation of a performance-related and actionable management tool: A meta-analysis and utility analysis*. Technical paper, The Gallup Organization, Lincoln, NE.

Harter, J. K., & Schmidt, F. L. (2002). *Employee engagement, satisfaction, and business-unit-level outcomes: A meta-analysis*. Technical paper, The Gallup Organization, Lincoln, NE.

Harter, J. K., Schmidt, F. L., & Hayes, T. L. (2002). Business-unit-level relationship between employee satisfaction, employee engagement, and business outcomes: A meta-analysis. *Journal of Applied Psychology, 87*, 2.

Harter, J. K., & Schmidt, F. L., Asplund, J., & Killham, E. A. (2003). *Employee engagement and business unit performance: A study of directionality*. Technical paper, The Gallup Organization, Omaha, NE.

Hunter, J. E., & Schmidt, F. L. (1983). Quantifying the effects of psychological interventions on employee job performance and work-force productivity. *American Psychologist, 38*(4), 473-478.

Hunter, J. E., & Schmidt, F. L. (1990). *Methods of meta-analysis: Correcting error and bias in research findings*. Newbury Park, CA: Sage.

Hunter, J. E., Schmidt, F. L., & Le, H. (2002). *Implications of Direct and Indirect Range Restriction for Meta-Analysis Methods and Findings*. Technical Paper. Michigan State University.

Huselid, M. A. (1995). The impact of human resource management practices on turnover, productivity and corporate financial performance. *Academy of Management Journal, 38*(3), 635-672.

Iaffaldano, M. T., & Muchinsky, P. M. (1985). Job satisfaction and job performance: A meta-analysis. *Psychological Bulletin, 97*(2), 251-273.

Judge, T. A., Thoresen, C. J., Bono, J. E., & Patton, G. K. (2001). The job satisfaction — job performance relationship: A qualitative and quantitative review. *Psychological Bulletin, 127*, 376-407.

Lipsey, M. W. (1990). *Design sensitivity: Statistical power for experimental research*. Newbury Park, CA: Sage.

Lipsey, M. W., & Wilson, D. B. (1993). The efficacy of psychological, educational, and behavioral treatment. *American Psychologist*, 48(12), 1181-1209.

Mayer, R. C., & Schoorman, F. D. (1992). Predicting participation and production outcomes through a two-dimensional model of organizational commitment. *Academy of Management Journal*, 35(3), 671-684.

Mosier, C. I. (1943). On the reliability of a weighted composite. *Psychometrika*, 8, 161-168.

National Technical Information Services. (1987). *Standard Industrial Classification manual*. Washington, DC: Executive Office of the President, Office of Management and Budget.

Ostroff, C. (1992). The relationship between satisfaction, attitudes, and performance: An organizational level analysis. *Journal of Applied Psychology*, 77(6), 963-974.

Reynierse, J. H., & Harker, J. B. (1992). Employee and customer perceptions of service in banks: Teller and customer service representative ratings. *Human Resource Planning*, 15(4), 31-46.

Rosenthal, R., & Rubin, D. B. (1982). A simple, general purpose display of magnitude of experimental effect. *Journal of Educational Psychology*, 74, 166-169.

Schmidt, F. L. (1992). What do data really mean? Research findings, meta-analysis, and cumulative knowledge in psychology. *American Psychologist*, 47, 1173-1181.

Schmidt, F. L., & Hunter, J. E. (1996). Measurement error in psychological research: Lessons from 26 research scenarios. *Psychological Methods*, 1, 199-223.

Schmidt, F. L., Hunter, J. E., McKenzie, R. C., & Muldrow, T. W. (1979). Impact of valid selection procedures on work-force productivity. *Journal of Applied Psychology, 64*(6), 609-626.

Schmidt, F. L., Hunter, J. E., Pearlman, K., & Rothstein-Hirsh, H. (1985). Forty questions about validity generalization and meta-analysis. *Personnel Psychology, 38*, 697-798.

Schmidt, F. L., & Rader (1999). Exploring the boundary conditions for interview validity: Meta-analytic validity findings for a new interview type. *Personnel Psychology, 52*, 445-464.

Schmidt, F. L., & Rauschenberger, J. (1986, April). *Utility analysis for practitioners*. Paper presented at the First Annual Conference of The Society for Industrial and Organizational Psychology, Chicago.

Schmit, M. J., & Allscheid, S. P. (1995). *Employee attitudes and customer satisfaction: Making a theoretical and empirical connection*. Paper presented at the 1995 Society for Industrial and Organizational Psychology Meeting, Chicago.

Schneider, B. (1991). Service quality and profits: Can you have your cake and eat it too? *Human Resource Planning, 14*(2), 151-157.

Schneider, B., Ashworth, S., Higgs, C., & Carr, L. (1996). Design, validity, and use of strategically focused employee attitude surveys. *Personnel Psychology, 49*(3), 695-705.

Schneider, B., & Bowen, D. E. (1992). The service organization: Human resources management is crucial. *Organizational Dynamics, 39*-52.

Schneider, B., White, S., & Paul, M. (1998). Linking service climate and customer perceptions of service quality: Test of a causal model. *Journal of Applied Psychology, 83*(2), 150-163.

Sechrest, L., & Yeaton, W. H. (1982). Magnitudes of experimental effects in social science research. *Evaluation Review, 6*, 579-600.

Ulrich, D., Halbrook, R., Meder, D., Stuchlik, M., & Thorpe, S. (1991). Employee and customer attachment: Synergies for competitive advantage. *Human Resource Planning*, 14(2), 89-103.

Wiley, J. W. (1991). Customer satisfaction: A supportive work environment and its financial cost. *Human Resource Planning*, 14(2), 117-127.

Appendices

Appendix A
Reliabilities of Business-Unit Outcomes
 (based on Schmidt & Hunter, 1996, scenario 23, p. 219)

<u>Customer</u>		<u>Profitability</u>		<u>Productivity</u>		<u>Turnover</u>		<u>Safety</u>	
<u>Reliab.</u>	<u>Freq.</u>	<u>Reliab.</u>	<u>Freq.</u>	<u>Reliab.</u>	<u>Freq.</u>	<u>Reliab.</u>	<u>Freq.</u>	<u>Reliab.</u>	<u>Freq.</u>
.89	1	1.00	2	1.00	2	1.00	1	.63	2
.87	1	.99	2	.99	2	.62	1		
.84	1	.93	1	.92	2	.60	1		
.75	1	.91	1	.90	1	.39	1		
.58	1	.90	1	.62	1	.27	1		
.52	1	.89	1	.57	1	.24	1		
.46	1	.79	1						
.33	1	.57	1						
		.56	1						

Appendix B
Test-Retest Reliabilities of Independent Variables
 (based on Schmidt & Hunter, 1996, scenario 23, p. 219)

<u>Overall Satisfaction</u>		<u>Engagement</u>	
<u>Reliability</u>	<u>Frequency</u>	<u>Reliability</u>	<u>Frequency</u>
.94	1	.92	1
.91	1	.86	1
.88	1	.83	1
.78	1	.80	1
.75	1	.79	1
.70	1	.78	1
.69	1	.77	1
.64	2	.76	1
		.66	1
