

BACK TO BASICS: LEARNING ABOUT EMPLOYEE ENERGY AND MOTIVATION
FROM RUNNING ON MY TREADMILL

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ABSTRACT

BACK TO BASICS: LEARNING ABOUT EMPLOYEE ENERGY AND MOTIVATION FROM RUNNING ON MY TREADMILL

In an effort to understand how to optimize employee energy at work, particularly during the dramatic times in which we are currently doing business, we borrow from the sports physiology literature to develop and test several concepts that have now been used in over 50 large and small organizations (e.g. automobile firms, banks, hospitals, manufacturing, high technology, service businesses, financial services, and more). Our focus on employee energy led us to develop new measures and processes for our research. The resulting studies presented in this paper test two hypotheses focusing on the link between employee energy, turnover, performance, and job satisfaction. Consistent with what we know about athletic performance, we found that energy is an optimization construct and that variation in employee energy at work has detrimental consequences for performance and satisfaction.

The concept of human motivation is at the core of any management-related discipline (e.g., human resource management, organization behavior, strategy, organization theory). The importance of this topic is attested to by the vast accumulation of research in this area. Fascination with the subject is based on the long-held assumption that more motivation leads to better performance, and therefore if we can understand what motivation is, how it is formed, and how to increase it, then we can use that knowledge to enhance individual and firm performance (Lawler, 1973). Yet, despite decades of research and theorizing, the concept of motivation in the organization remains contested. Hundreds of definitions exist (Landy & Becker, 1987), numerous theories have been presented to explain motivation (Ambrose & Kulik, 1999), and consistent measurement of the construct has suffered as a result (Pinder, 1984). Indeed, Ambrose and Kulik (1999) suggest that researchers have shied away from trying to define motivation at all. Given the critical role that motivation plays in organizational studies, and how important motivation is becoming today¹, we sought to take yet one attempt at re-evaluating the concept of motivation but from a somewhat different perspective. We hope that our novel approach not only adds to what we currently know about motivation but helps bring the topic even further into the forefront of managing businesses.

At the core of our argument is the assumption that motivation at work is really about employee energy, and although energy can be directed at many efforts (e.g., relaxation, sports, homework, etc.), we study energy exerted at work. Given our interest in motivation, and our

¹ Note the increasing interest in work such as that done by Gallup via their Q12 that promises to help employers with employee engagement; Hewitt's engagement process, and Watson Wyatt's employee engagement work, among other consultants.

belief that human energy is at the core of motivation at work, we sought to explore ways that human energy has been studied in non-work settings. Our goal was to see if we could transfer learning from non-work disciplines in a way that would help us find a new approach to studying motivation. As a result of this search, we found an extensive literature in sports physiology that specifically describes and assesses human energy directed at optimization of performance (in both its physical and mental aspects). In reviewing this literature, we came to the conclusion that one key difference between sports physiology and the management motivation theories is that within the sports literature, more motivation or more human energy is not always better. In fact, the sports literature would suggest that athletes or anyone attempting to maximize bodily energy should find the level of exertion that is best for that individual (given factors like age, overall physical health, etc.) and then minimize variance around this target.² In other words, energy is something that should be optimized, not maximized. If we generalize to other examples of energy, we see many arenas where more energy is not always better.

For example, delivering higher levels of energy to a light bulb will not make it brighter; instead, more energy will make the bulb explode. The field of quality management made great strides in helping organizations improve performance and quality by teaching businesses how to find an optimal level of machinery output and then minimize variance in the output level. It is the minimization of variance that drives out error.

The same concept of optimization vs. maximization is true for human beings. Too much motivation or energy can lead to detriments in long-term performance, as is poignantly captured in the Japanese phenomenon of *karo-jisatsu* (Japanese phenomenon of death through overwork). Even though we know that more energy is not always better, many well-established

² As will become apparent below, there are two ways in which variation appears in training, one of which

theories of motivation de-emphasize this insight.

WHAT WE KNOW ABOUT MOTIVATION OR ENERGY AT WORK

We know that motivation is key to the study of human behavior, both at work and in other contexts³. We also know that there is no agreed upon definition to the word. In 1981, Kleinginna and Kleinginna gathered 140 definitions of motivation from the academic literature. As Ambrose and Kulik (1999) show, the situation has not improved in recent years. Definitions range from the cognitive (motivation is a cognitive process governing choices made by people between alternate types of voluntary activity [Vroom, 1964]) to the behavioral (motivation occurs when there are proper reinforcements, since behavior reflects its consequences [Skinner, 1969]). Some even suggest that motivation is merely an analytic tool which helps an analyst to explain behavior (Ambrose & Kulik, 1999). As a result, Dewsbury (1978: 4) suggested that “motivational research and theory is in a state of disorder” due to the “uncritical acceptance of the construct.”

Our read of the literature shows that the word motivation covers much territory, ranging from theories of the determinants of “motivation” through discussions of “technologies” to increase levels of “motivation” or “motivated behavior” to theories about the consequences of “motivation.” As is readily apparent from Table 1, the approaches that characterize the field differ vastly on how to enhance motivation, or even whether it is important to understand the process of motivation. One thing that the various approaches have in common is no clear recognition or articulation of the fact that more motivation can become too much motivation.

is detrimental and the other beneficial.

³ We do not attempt to provide an extensive literature review in this paper; this has been done by many other authors. For example, see Ambrose and Kulik (1999) for a thorough review of the literature; they review over 200 articles written in the 1990s.

This may be due to the fact that when these authors were writing, the focus of business was how to improve motivation. But today, burnout and over-motivation may be as much of a problem to businesses as low motivation.

Insert Table 1 about here

ATHLETIC PERFORMANCE AND MOTIVATION

As the riddle of employee motivation has plagued management researchers looking at the issue, scientists have begun to look elsewhere to find answers. A similar question faces those who strive to be top athletes or even to enter into a systematic exercise program designed to optimize bodily energy use (i.e., consume calories, help the individual feel better, and raise overall health). The assumption that more is better was, for many years, adopted by athletes, but recent research suggests that the human body does best under a different set of conditions.

Performing at the outer bounds of human capabilities requires not only the genetic gift of innate skills, but long hours of training as well. As the many popular tales, stories or movies about athletes attest, staying focused and motivated during this intense and often emotionally painful period may be the toughest problem to be overcome by the athlete. However, the process can seem much the same even for someone who is not Olympic quality. Therefore, it may make sense to see how athletic trainers and sports physiologists have struggled to overcome this stumbling block.⁴

Ideas about sports behavior have been applied to business practice before. But writers in this tradition mainly borrow from the sports psychology literature (cf. Perry & Jamison, 1997), sports strategy literature (cf. Leifer, 1988; Gilbert & Jamison, 1994; Rosenbaum, 1979), or

sports coaching literature (cf. Hargrove, 1995; Kinlaw, 1999; Shula, Blanchard & Cruderman, 1995), rather than the sports physiology literature. Such writers either strive to create top-flight managerial performance by incorporating the athletic mindset into the workplace or to enhance employee performance by enlightening the manager into the secrets of successful athletic coaching.

Sports physiologists now realize that the human body can only perform at its peak level for a short period of time (on the order of a few months). Therefore, it is necessary to periodicize training regimens and as a result, the way in which energy is being exerted (Burfoot, 1997; Glover & Glover, 1999; Noakes, 1991). This approach to motivation (energy exertion) and training proceeds in stages, peaking for certain key events. For example, runners with high performance goals will first build a strong aerobic base. Building on this base, high-intensity workouts are then used to increase, or *sharpen*, strength and speed. While these are objectively tougher workouts, they should feel not that much tougher subjectively. This workout schedule should lead to dramatic increases in performance, which if timed correctly, peaks at the primary event for which one is training. But to ensure a strong performance at a given event, athletes taper (recover) for a short period of time prior to the race by reducing the overall volume of training. This effort is followed by a more intense period of recovery (during which training still feels somewhat hard as the body recuperates from the previous stresses it faced), and the process is repeated as necessary. While there is a long-period cycle, there should be little variation in effort in any short time frame.

So it is obvious that there are two forms of variation in training. One, which is beneficial, is to vary the routines and purposes of the training schedule. The other, which is

⁴ For an overview of the exercise physiology literature, see the Report of the Surgeon General (1999).

detrimental, is variation in perceived effort. As the aching bodies of “weekend warriors” can attest, the human body does not well handle such variation. Consider the plight of the non-athlete trying to optimize an exercise routine. The first thing that is done upon entry to any professionally run health club or gym is to determine an optimal workout program for someone. The target heart rate is calculated, and the after-work athlete is taught how to exercise while maintaining a level of work that is within his/her zone (target heart rate zone).

One technique that trainers use to advise athletes to avoid overtraining is through the use of perceived effort scales. The walls of health clubs often are adorned with depiction of such scales. While many such scales are numeric, others use faces to assist the rating process. Generally a person rates the workout on a scale from very easy to overly difficult, with the goal being to stay in a middle zone where the workout is tough but not exhausting. Overtraining leads to injury and burnout, diminishing the athlete's motivation. Similarly, we argue that perceived energy exertion at work should be roughly constant (low variation) for higher performance. Consistently bouncing from being underworked to being overworked and back will decrease the motivation and effectiveness of the employee.

Hypothesis 1: As variation in employee energy at work increases, performance will decrease.

A measure of employee energy contextualizes the perceptions one has of the work environment. How hard one is working, how challenging one's work is, how efficiently that work is getting done, all of these are relative to the subjective sense of one's capacities and abilities, at a given moment. We can push this further, though. How one feels about the effort one is exerting should be shaped by how one feels about one's job. While the pace and efficiency of work should shape energy level, we suggest that the satisfaction one has with one's

effort will be associated with the variation in employee energy. This works both ways: the more satisfied one is with work, the less one's energy should vary, and the less one's energy varies, the more satisfied one will tend to be with work. This should be true regardless of the level of the energy one has – one may be more satisfied with one's job whether one is working hard or easy as long as the demands on you are roughly constant.

In a sense, this is analogous to an athlete who has entered the 'flow' (Csikszentmihalyi, 1991), or what Perry and Jamison (1997) call 'the Zone.' At this point, the challenges facing the athlete match the abilities they bring to the activity, such that the activity demands full focus and a high level of energy. This combination leads to an increased chance for success and, more importantly, a stronger sense of satisfaction with the activity and its outcome. An elite marathoner and the average jogger may both reach this state, albeit at a vastly different pace. In a similar manner, satisfaction with the work experience may be most likely to occur when the match between the sense of one's abilities and the tasks asked of you match on a consistent basis over time. Constantly wavering between being under-challenged and over-challenged will likely lower satisfaction. On the other hand, dissatisfaction with one's abilities make flow much less likely to occur, increasing the sense that one's work experience is out of control, and thereby increasing the variation in reported pulse.

Hypothesis 2: Variation in employee energy level will be negatively associated with job satisfaction.

METHODS

The measure of employee energy at work that we employ in our research was used in two prior studies (Welbourne, 1997; Welbourne & Felton, 1998). The question asked of employees

on a weekly basis uses a 0 to 10 scale, which reads in ways that are parallel to sports language⁵. The first few companies to use this metric were high technology firms on the west and east coasts. They were looking for a more marketing way to “sell” the process internally, and as a result, the term “Pulse” was coined. In addition to the overall process and measure being called Pulse, labels were borrowed from sports to describe the scale. The low end of the scale (from 0 to 2.4) is called the “at rest” zone, and in this area employees report that they are not doing much, do not feel energized by their work, and are generally not very satisfied with being in this state. The next range is from 2.5 to 7.5, and this is called the “aerobic zone.” As one moves up in the scale, the individual reports that they are more energized, feel better about what they are doing, and are more efficient. The concept is similar to that used by athletes when monitoring their perceived effort. There, as individuals work harder, they burn calories and gain health benefits, but if they work too hard, they can incur serious health risks. The last category on the scale is between 7.6 and 10, and that is called the “anaerobic”zone. Employees report being in this zone when they are over-energized, not efficient and are overall not doing well (see Welbourne, 1997 for more details on the measure).

The measure was first tested within a software firm (Welbourne, 1997). The study utilized a mean of 20 weeks worth of data to test a hypotheses on the determinants of individual performance. In a second study (Welbourne, 1998), the measure was used as an organization went through its initial public offering (IPO). In this study, the organization, rather than the

⁵ Since this research was conducted and the paper prepared, the measurement of energy at work has been further refined. In addition to the measures referred to here, a new and more simplified measure is now being used successfully. The newer metric has been used in 50 countries (simplification of the construct was very important for this work). The new wording continues to use the 1 to 10 response scale (and continues to incorporate the idea of optimization), but the new measure deletes references to the “aerobic” language and follows a more traditional format of wording with options going from 1=not at all energized to 5=very energized and 10=overly energized or burned out. A simple color scale that goes from blue on the low end to red on the high end also is used; that helped as the metrics were being used in countries other than the United States.

individual, was the unit of analysis. The study examined how the measure of energy changed as the organization experienced a significant organizational change event (the IPO). Therefore, although limited, there is some evidence that the measure is related to performance metrics that we would suspect should be linked if the question assessed motivation or energy at work.

For purposes of our study we use the same 0 to 10 scale, asking the question of employees in several organizations on a weekly or bi-weekly basis. The data are obtained from two groups. The first study is conducted with a call center that has close to 5,000 employees. The second study is a multi-organization study (primarily smaller firms) using individual level data collected on a weekly or bi-weekly basis.

STUDY 1: Within Company Analysis

Due to problems in obtaining comparable performance data in the various companies studied, we chose only one organization for the test of hypothesis 1. The establishment, a division of a Fortune 1000 organization, is a call center located in the United States. The dependent variables collected include voluntary turnover during a six-month period starting with the first survey,⁶ as well as a performance measure provided at the end of the six months. The performance measure is an objective assessment made by the manager of the employee (1, below expectations; 2, on track; 3, exceeds expectations; 4, significantly above expectations; the wording of the scale was changed in this paper to protect the identity of the company). Not surprisingly, most people fall in the second and third groups.

The key independent variable is the energy measure described earlier (the 1 to 10 scale). Both the mean and standard deviation of this term were calculated for data collected over four time periods, with those periods representing the first four data collections.

Logistic regression was used for the turnover analysis, and linear regression was used for the performance data analysis. The energy measures are the independent variables, and control variables include gender (dummy coded to indicate male), a departmental indicator (dummy coded to indicate technical or operations unit versus staff), managerial status (dummy coded to indicate manager), and race (dummy coded to indicate white).

STUDY 2 – Multi-Organization Study

Data were gathered from seven organizations, ranging from small software firms (n=236) to divisions of a Fortune 100 company (n=1,059). Data were collected either weekly or bi-weekly during the time period from May 1998 through May 2000. E-mail surveys with links to a proprietary software program were used to elicit responses from employees and conduct data analysis, allowing us to track responses within-person over time. For comparability, we utilize data from the first four survey periods for each company. These data are analyzed using correlational and regression analyses. Given the need to use four weeks of data, we limited the study to only those individuals who completed the survey during all four weeks. Thus, the sample, which started with 3,137 individuals, ended with 844.

This study was used to test Hypothesis 2. The dependent variable is a self report measure of job satisfaction that was obtained for four time periods. The average for each person's job satisfaction scores was used as the dependent variable (1, very dissatisfied, to 5, very satisfied). Company codes were entered as a set of control variables (dummy coding). The key independent variable, variation in employee energy, was developed by calculating the standard deviation of the energy scores over the four-week period of time. In addition, the average score for four-week energy was used as a control variable.

⁶ Involuntary terminations were excluded from the analysis, since they arise because of a different process.

ANALYSIS

The descriptive statistics (means, standard deviations, and correlations) are presented in Table 2. In the overall sample that combines the multiple company data sets, the average of energy for the first four weeks is positively correlated with job satisfaction (.08), with efficiency (.15) and with pace of work (.62). The standard deviation of energy, however, is correlated negatively with pace (-.09), efficiency (-.10), and job satisfaction (-.15).

In the within-company data set, turnover is positively correlated with both the mean on energy (.13) and with the standard deviation (.16). Thus, higher energy and higher variation are associated with higher turnover. The standard deviation of energy, however, is negatively related to the performance measurement scores (-.11) and positively related to the mean energy levels (.09).

The research design is such that we collected less questions more frequently than one would traditionally do in an organizational survey study. We did this to meet the needs of the firms with whom we were working, and we took advantage of technology that allowed us to do this (e.g. you would not do this if you were administering paper surveys). As such, we could not calculate reliability coefficients by analyzing multiple versions of questions that tap into the same construct. However, we could assess reliability with a calculation that uses the results of an answer to the same question asked multiple weeks. Thus, for the four time periods, we calculated a coefficient alpha, and the results are: .86 for the energy question, .88 for job satisfaction, .75 for pace of work, and .81 for efficiency.

Insert Table 2 about here

However, the results did not change even with involuntary terminations included.

Hypothesis 1

Hypothesis 1 states that variation in energy is negatively related to performance, and for this analysis, we studied the relationship of variance in energy to two performance outcomes, voluntary turnover and performance appraisal scores. Table 3 presents the results of a logistic regression on voluntary turnover in this establishment. Table 4 presents the results of a linear regression on managerial assessments of employee performance in the same establishment. In both analyses, the question we are addressing is whether variation in energy predicts performance-related outcomes.

Insert Tables 3 and 4 about here

The first block in Table 3 includes the control variables. The next block adds in the average energy, while the final block adds in the standard deviation of energy over the same time period. The clearest effect is that the standard deviation of employee energy, makes it more likely that a worker will leave the establishment. The results in Table 4 offer parallel, but less compelling, results. Overall, these data present support for Hypothesis 1.

Hypothesis 2

To examine the link between the energy and job satisfaction, we use the multi-organization data. Here, we try to predict average job satisfaction as an outcome. Job satisfaction was asked during the same time period the energy question was asked. We again begin by controlling for any superfluous company effects using company dummy indicators in the first block. It is apparent that the companies differ in the average level of job satisfaction (measured on a five-point scale).

Insert Table 5 about here

In the second block, we add in the pace and efficiency measures, which were metrics that we collected at all organizations; thus, we could use these as additional control variables for the analysis. The only two statistically significant effects are for variation in energy and the average efficiency. As one's general sense of efficiency increases, so does one's job satisfaction. As variation in energy increases, satisfaction decreases. Thus, Hypothesis 2 receives support from this multi-organization analysis.

DISCUSSION

Our search for a new way to approach motivation as an object of study led us to consider the sports physiology literature. The analogy we drew, based on the key findings of that area of research, proved useful for examining the link between motivation, directed human energy, and performance outcomes. While the measure of energy used here was developed separately in an empirical research context, the theoretical implications we present here indicate that there are strong underpinnings to the measure in a well-researched application of how people become motivated to expend energy in a directed manner.

We show that there is a conceptual bridge between the understanding of the human body from a physiological viewpoint and ways of thinking about the social behaviors of human beings, particularly in the workplace. One advantage that researchers examining the human body and its physical performance have had over social science researchers is the ability to take concrete (albeit invasive) measurements to see exactly how the body responds to various physical training regimes (or their lack). We do not claim that the energy metric has the accuracy of a blood analysis for detecting lactic acid in the blood. But on the other hand, the link between the objective measures of fitness (VO_2 max, $LTVO_2$) and the performance of actual athletes is somewhat tenuous (e. g., some of the best marathoners in the world have lower than expected aerobic capacities – no one measure is a perfect predictor of athletic performance). Thus energy, as a measure of directed energy exertion associated with motivation, is a useful tool for examining subjective interpretations of effort. Further, this measure grounds those subjective interpretations in a metric relative to the particular individual. The utility of this diagnostic tool is further enhanced by the way it seems to delve into a subjective experience previously untapped by other measures used to examine the link between antecedents and work

performance outcomes.

For example, Figure 1 shows the effect of a merger on the energy of a department in a Fortune 500 firm. The figure displays the trend of the average energy during a 33-week period (approximately 8 months). Note the dotted lines that form the boundary around the text that says “productivity zone before the merger.” We asked employees to identify the energy level where they feel most productive, and then drew a ‘productivity boundary’ $\frac{1}{2}$ standard deviation on each side of the mean value. This ‘control’ parameter serves as a guide to energy. When the average energy trend is above or below this productivity boundary, it indicates that employees are not working in their optimal zone. The department depicted in Figure 1 had a pre-merger productivity boundary that ranged from 5.8 to 6.9.

Taking a look at the employee energy trend, note that in week 6, the average pulse jumps from a 6.8 to a 7.6. This change corresponds to the announcement of the merger. The average energy moves up and down over the next several weeks as the initial merger fervor quiets down, but then begins to climb steadily as the actual work on the merger integration happens (starting at about week 18). This period was very stressful for employees – employees commented that the high workload coupled with the uncertainty from the merger added to the raised pulse. During this period from week 6 to week 24, the average energy for the department almost always ranged above the productivity zone, indicating employees were working above the energy level where they had indicated they were most productive.

In week 24, we once again asked employees to tell us the energy level where they felt most productive. We wanted to see if the stress from the merger affected these levels. Sure enough, the graph shows a training effect. Note the lines bordered around ‘productivity zone after the merger.’ The productivity zone moved higher – to a low of 6.7 and a high of 7.8. Being

repeatedly subject to the stress from the merger trained employees to work at the higher energy level. For weeks 24-33, although the average pulse was still in a high range, it fell within the productivity zone.

This analysis is exploratory, but it does suggest that the energy is diagnostically useful. The merger training effect shown in Figure 1 confirms that changes over time in the energy are associated with employee's (adaptive) response to their work experience, or the failure to cope with the demands of their work environment. Much like physical training helps the body adapt to the exertion of exercise, employees can adapt to working at a higher stress level.⁷ Note that as with physical training, this adaptation can only be pushed so far. A runner could not 'sprint' a marathon and remain healthy any more than a worker can sustain burn-out levels and remain energized. But there is a zone within which people can be pushed to perform more effectively at an increased workload. Furthermore, training implies that the stressors are increased in a steady fashion so that the body has time to adapt. The 'weekend warrior' effect can occur in the workplace, when people who are not used to stress are suddenly subject to very high levels. This type of variation in pulse leads to observable performance loss in the workplace, specifically showing up in an increased risk of turnover and lower objective performance. Similarly, variation in pulse is associated with lower job satisfaction because of the accompanying changes in perceived difficulty of accomplishing one's tasks.

⁷ Bear in mind that this zone is where the employee feels most productive, not necessarily the most comfortable.

IMPLICATIONS FOR RESEARCH

The energy contextualizes a person's effort such that the link between motivation and performance outcomes becomes relative to the capacities of that individual; the same amount of motivational technology applied to two individuals may result in the same subjective gain in performance, but this will not be reflected in similar objective performance improvements.⁸ Motivation research has to focus on more than the link between the perceptions of managers and objective performance gains.

Finally, having personally experienced the effects of overtraining ourselves, we suggest that the motivation literature needs to place more analytic emphasis on the potential for “over-motivating” employees over the long term. While early organizational theorists (such as Marx or Taylor) focused on the way workers resist managerial demands for more output, and while many criticize American workers for their sloth, we suggest that there are many people out there working very hard (cf. Schor, 1993; Hochschild, 1997). Indeed, note that the productivity zone in Figure 1 lies in the aerobic to high aerobic range. Ultimately, though, both sides of the motivation coin (under- and over-) are equally important from a research stance.

But we suggest that the implications of our work reach beyond the motivation literature. While the notion that there are limits on gains from pressing further along a path is not new to the social sciences (e.g., human capital explanations of the age effect on wages and the Laffer curve are two examples), we do believe that the emphasis on the limits introduced by the human organism need to be better studied in organizational settings. We note that even this insight is not new to the social sciences; indeed, it is one of the cornerstones of Taylor's scientific

⁸ Think of going for a jog with a world-class marathoner. You may both equally benefit from the application of some motivational tool, but that hardly means that the average person could actually “jog” alongside the marathoner. Likewise, the gain would not necessarily be the same (the marathoner is near their limits already, so s/he may show

management approach. However, biology has advanced far from Taylor's day. Organizational and individual performance are more than states of mind.

Another interesting application may be using the energy work to understand employee engagement. As employee engagement seems to be fast becoming a subject of interest to many consultants and HR managers, application of motivation and energy theory may help bring some additional theoretical perspectives to the work.

LIMITATIONS

Although the research is strengthened by having multiple sites and multiple time periods of study, these same factors also present limitations for our work. It was difficult to find comparable performance outcome measures (thus, performance was examined in only one organization), and control variables were not equally available at all sites. In addition, the frequent nature of our data collection and extensive reliance on open-ended comment data meant that our ability to add supplemental questions was limited. Future research would benefit from including multiple measures of motivation and the predictors and outcomes of energy so that a more thorough nomological network could be established and explored over time and across organization types.

Additionally, many of the items used in the studies were collected from individual employees. For example, the analysis of energy and satisfaction used data collected from the same respondent. Thus, errors associated with response bias must be considered. However, our ability to ask questions in multiple time periods may have helped minimize such errors.

IMPLICATIONS FOR PRACTITIONERS

Since the time that these studies were conducted and this paper written, several additional research projects have been done with organizations interested in applying the energy work within their own companies. One of the most important things we have learned from this work is that the concept of energy has high “face validity” for managers. We have given weekly reports with departmental zones and data to thousands of managers, and they easily use the data to make changes in their own departments. Those changes can be studied over time to determine which changes lead to higher or lower energy levels. The simplicity of the data collection and reporting process, combined with the rigor of the methods (although always in need of improvement), seems to be something that appeals to the every day line manager in addition to the senior executive. Additionally, we have been giving individual employees their own reports showing trended energy levels compared to those of the groups in which they work and the overall company. This type of self-reflective data is similar to what an athlete reviews during the exercise regimen. We are currently exploring ways to help employees monitor their own energy at work and use this as an additional way to monitor their own career and work-related progress.

The other interesting outcome has been the transportability of the metric to countries other than the United States. Simplification of the scale was important for the global research; however, when the metric was simplified (we deleted references to aerobic, anaerobic), and used a color scale to enhance meaning, this led to our being able to use the measure in over 50 countries.

Over the last seven years of doing this research, we have continued to find that the measurement properties of the scale hold up (reliability, validity), but probably the most

interesting learning of all has come from the open-ended comment data that accompany the metrics. Where managers and employees use the data for their own self and departmental analysis, it seems that the open-ended comment data has proved very useful to HR executives who are helping their leaders manage change and implement strategy. The by-product of the frequent measurement process has been the ability for HR managers to obtain significant business-related data. In general, the things that energize or de-energize employees reflect the type of information business leaders need to know in order to plot strategy and determine when the strategy needs to be realigned. Thus, the HR managers involved in the research have been able to use their frequent data to implement strategy because they are closely keeping track of changes in the organization. HR managers have a new view of the overall business as seen through the eyes of employees. The implications for HR executives using employee data collected frequently are being explored in studies that are currently in progress.

Given the vast numbers of employee comments that we have received in all studies, we are now in the process of doing a thorough analysis of the qualitative data. The results will help us understand what employees and managers are actually doing to improve their own energy levels at work. This type of data will be useful in not only understanding energy but in helping HR executives, leaders, and line managers understand what they can do as “trainers” to keep all of their employees “in the zone.”

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TABLE 1
Types of Motivation Theories

| THEORY | EXEMPLAR | CONCEPT | TOOL |
|----------------------|---|--|--|
| Motives and Needs | Maslow (1954), Herzberg, et al. (1959) | Innate drive to fulfill needs, which are hierarchical | Motivators should meet needs, such as growth |
| Expectancy | Vroom (1964) | Given set of preferences, probabilistic cognitive choices are made from set of alternative actions, based on perceptions of returns gained | Enhance perceived returns associated with desired outcomes |
| Equity | Adams (1963), Thibaut & Walker, (1978) | Perceptions of inequity generate internal tension, which motivates effort to resolve tension based on cost-benefit analysis of alternatives; socially contextualizing the rational calculator of expectancy theory | Avoid de-motivators and perceptions of inequity |
| Goal Setting | Locke (1968), Locke & Latham (1984) | Specific and difficult goals motivate behavior | Set goals, provide feedback to maintain intended behaviors and goal commitment |
| Cognitive Evaluation | Deci (1971) | Replace tension-reduction approach with intrinsic motivation concept; given a preference structure, people seek stimulation from their environment, challenges provide motivation, competence provides reward | Enhance mechanisms leading to moderate challenges and gains in competence |
| Work Design | Hackman & Oldham (1976) | Characteristics of job associated with outcomes, such as satisfaction | Job redesign to motivate desired outcomes |
| Operant Conditioning | Skinner (1969), Luthans & Kreitner (1975) | Motivation is learned response to positive reinforcements | Reinforcements and sanctions |
| Self concept | Sullivan (1989) | Motivation for behavior is to act in ways consistent with perceptions of one's self, which leads to diversity of behaviors | Match desired behaviors with perceptions of self |
| Fear | Welbourne (1995) | Moderate levels of fear, combined with effective coping techniques, motivate behavior | Evoke moderate sense of fear, with effective coping techniques |

TABLE 2*Descriptive Statistics and Correlations*

2a. Multi-organization data, n=844 (after cases with missing data excluded)

| | Mean | SD | (1) | (2) | (3) | (4) | (5) |
|-----------------------|------|------|---------|---------|---------|--------|------|
| 1. Energy average | 5.86 | 1.89 | 1.00 | | | | |
| 2. Energy SD | 0.95 | 0.95 | -0.21** | 1.00 | | | |
| 3. Pace Average | 3.63 | 0.92 | 0.62** | -0.09** | 1.00 | | |
| 4. Efficiency Average | 3.51 | 0.77 | 0.15** | -0.10 | -0.15** | 1.00 | |
| 5. Job Sat. Average | 3.41 | 0.95 | 0.08** | -15*** | 0.14** | 0.39** | 1.00 |

Note: Descriptives & correlations for individual company dummy variables available from the authors.

2b. Service center data, n=4,629

| | Mean | SD | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|--------------------------|------|------|---------|---------|----------|-------|--------|---------|----------|----------|---------|------|
| 1. Turnover | 0.07 | 0.25 | 1.00 | | | | | | | | | |
| 2. Performance Appraisal | 2.56 | 0.58 | 0.03 | 1.00 | | | | | | | | |
| 3. Energy Average | 5.68 | 1.47 | 0.13* | 0.09 | 1.00 | | | | | | | |
| 4. Energy SD | 1.14 | 1.10 | 0.16** | -0.11 | -0.14** | 1.00 | | | | | | |
| 5. White | 0.84 | 0.37 | -0.14** | -0.03 | 0.15** | 0.10 | 1.00 | | | | | |
| 6. Male | 0.40 | 0.49 | -0.06 | -0.17** | 0.10* | 0.02 | 0.15** | 1.00 | | | | |
| 7. Manager | 0.37 | 0.48 | 0.02 | 0.07 | 0.34*** | -0.03 | 0.11* | 0.16** | 1.00 | | | |
| 8. Operations Dept. | 0.72 | 0.45 | 0.02 | -0.05 | -0.20*** | 0.05 | -0.10 | -0.06 | -0.45*** | 1.00 | | |
| 9. Technical Dept. | 0.19 | 0.40 | -0.03 | -0.11 | 0.13* | -0.07 | 0.031 | 0.18*** | 0.34*** | -0.78*** | 1.00 | |
| 10. Staff Dept. | 0.09 | 0.28 | 0.01 | 0.21** | 0.14** | 0.01 | 0.11* | -0.16** | 0.23*** | -0.50*** | -0.15** | 1.00 |

TABLE 3
Service Center Data
Dependent variable: Voluntary termination

| Variable | Model 1 | | |
|--|----------------|-----------------|-----------------|
| | Block 1 | Block 2 | Block 3 |
| | B (s.e.) | B (s.e.) | B(s.e) |
| Intercept | -2.73 (0.88)** | -5.99 (1.66)*** | -8.35 (1.96)*** |
| <i>Controls:</i> | | | |
| Technical Dept. (reference: staff) | -0.42 (0.99) | -0.26 (1.02) | -0.08 (1.02) |
| Operations dept. (reference: Staff) | -0.43 (0.86) | 0.18 (0.88) | 0.27 (0.88) |
| White (0=non white) | 1.11 (0.52)* | 1.29 (0.53)* | 1.41 (0.56)* |
| Manager (0=non manager) | -0.40(5.39) | -0.11 (0.56) | 0.01 (0.57) |
| Male (0=female) | 0.31 (0.54) | 0.40 (0.55) | 0.72 (0.58) |
| 4 week Energy average | _____ | 0.45 (0.18)* | 0.64 (0.21)** |
| 4 week Energy standard deviation | _____ | _____ | 0.65 (0.19)*** |
| Block chi-square | 5.61 | 6.55 | 10.43 |
| Model Chi-square | 5.61 | 12.16! | 22.59** |

! p < .10
* p < .05
** p < .01
*** p < .001

TABLE 4
Performance – Performance Scale Analysis
Dependent Variable: Performance Appraisal Scores

| | Model 1 | |
|---------------------------------------|-----------------|-----------------|
| | Block 1 | Block 2 |
| Variable | B (s.e.) | B (s.e.) |
| Intercept | 2.90(0.17)** | 2.97 (0.17)*** |
| <i>Controls:</i> | | |
| Operations Dept. (reference: staff) | -0.26 (0.13)* | -0.26 (0.13)* |
| Technical dept. (reference: Staff) | -0.37 (0.15)* | -0.39 (0.15)** |
| White (0=non white) | -0.07 (0.12) | -0.06 (0.12) |
| Manager (0=non manager) | 0.09 (0.09) | 0.09 (0.09) |
| Male (0=female) | -0.14 (0.08)! | -0.14 (0.08)! |
| Independent Variable | | |
| Energy standard deviation: 4 weeks | ----- | -0.07 (0.04)! |
| R2 | 0.07* | 0.08** |
| Adj. R2 | 0.04 | 0.05 |
| R2 Change | 0.07* | 0.02! |

! p < .10
* p < .05
** p < .01
*** p < .001

TABLE 5
Pulse and Job Satisfaction: Multi-organization data
Dependent variable: Average Job Satisfaction

| Variable | Model 1 | |
|------------------------------------|-----------------|------------------|
| | Block 1 | Block 2 |
| | B (s.e.) | B (s.e.) |
| Intercept | 3.46 (0.05)*** | 1.84 (0.17)*** |
| Controls: | | |
| Company A | 0.24 (0.24) | 0.18 (0.22) |
| Company B | 0.12 (0.08) | 0.13 (0.07)! |
| Company C | 0.28 (0.20) | 0.40 (0.19)* |
| Company D | 0.07 (0.08) | 0.11 (0.07) |
| Company E | -0.22 (0.10)* | 0.03 (0.09) |
| Company F | 0.22 (0.12) | 0.32 (0.11)** |
| Independent Variables: | | |
| Average Energy | ----- | -0.02 (0.02) |
| Pace of work 4 Week Average | ----- | -0.02 (0.42) |
| Efficiency Level 4 Week Average | ----- | 0.52 (0.04)*** |
| Standard Deviation Energy | ----- | -0.10 (0.03) *** |
| R2 | 0.02** | 0.21*** |
| Adj. R2 | 0.01 | 0.19 |
| R2 Change | 0.02** | 0.18*** |

! p < .10
* p < .05
** p < .01
*** p < .001

FIGURE 1

Effect of Company Merger on Department Energy (Pulse)
Trend line shows average pulse over 33 week period

