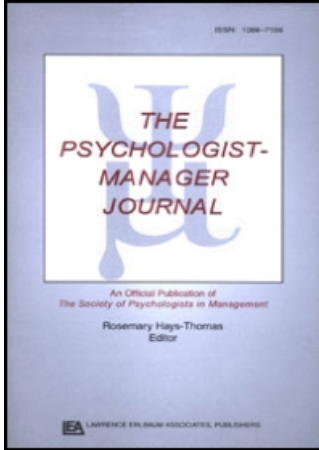


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### Leading and Learning: Lessons on Leadership from the Science of Learning

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## I. PRESIDENTIAL ADDRESS

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# Leading and Learning: Lessons on Leadership from the Science of Learning

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In this 2007 presidential address to the Society of Psychologists in Management, I have examined some of the classic lessons from the psychology of learning and attempted to apply them to issues of management and leadership. In particular, I have looked at some of the major findings related to (a) the effects of feedback on learning and (b) the effects of stress or anxiety on learning. My goal is to understand the behaviors of leadership in terms of theories about how people learn, and to suggest that leadership behaviors can be shaped through the use of principles derived from the science of learning. Three cases provide examples of how lessons from learning theory could have provided a structure for improving critical leadership behaviors.

Most of us have professional identities onto which we overlay our perceptions of ourselves as leaders, managers, or consultants. For example, we in SPIM are all psychologists, and many of us identify ourselves professionally in other ways as well. My first professional identity was as a journalist, but after my work in that field nurtured an intense interest in research and I returned to graduate school and

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subsequently entered the academic world, my identity became that of a scientist. My earliest work was in the psychology of learning and motivation, and my early career teaching focused on the psychology of learning and instruction. As my academic work began to focus on health issues, I applied the psychology of learning to problems of health and health behavior change. So, while I usually describe myself today as a health psychologist, or an executive coach, and a consultant, the issues, strategies, and approaches of research in the psychology of learning seem always to provide the foundation for how I view and approach the issues in which I am involved.

In considering what I might share with SPIM colleagues in my presidential address, therefore, I decided to return to my roots to examine more carefully some of the classic lessons I recall from that earlier training in the psychology of learning. In my current work involving management and consulting, as well as research, I do not think every day about great experiments in the psychology of learning. Quite frankly, I wondered whether I would still find those lessons compelling. The language of science and the language of consulting are not the same, and that fact creates certain demands if we wish to be understood by others. Nonetheless, it seems worthwhile to ponder what research in learning has taught us about leadership behavior, and that brings me to the questions that I want to pose today. How do some of the great experiments, or lessons, about how people learn influence our behavior as leaders? Can understanding those lessons help us to understand better the behaviors of leadership—our own or that of others? And can it help us to understand how we, as psychologists, can shape the behavior of leaders?

## Great Lessons from the Psychology of Learning

Given our time constraints today, I have chosen just two of what I consider “great lessons from the psychology of learning.” They are: (a) the effects of feedback on learning, and (b) the effects of stress or anxiety on learning. It may seem that there is nothing new to be said about these issues. Feedback is good and stress is bad—right? But on reflection, I am sure you will agree that these are actually two very big questions—with some complex and multi-faceted answers.

For this discussion to be meaningful, we’ll need to have a common understanding of what is meant by learning, and that might not be easy to agree upon. Some of you may not like my definition, because it is essentially a “behavioral” one, and in that case, I ask you to indulge me here—at least until we have more content on the table. My definition is this: “Learning is a change in human behavior, disposition or capacity that can be ascribed to experience or practice.”

The premise I put before you now is that, in fact, leadership is *all* about learning—and about just the kind of learning that this definition reflects. Leadership implies providing direction, and direction implies that we are *going*

*somewhere*. To *go somewhere*, of course, implies change, and leadership is about that change in behavior, disposition, or capacity that *takes us somewhere*, that *takes an organization to a new place*—whether that change, that “new place” is in terms of size, shape, content, focus, strategy, or simply a new place in time. But a leader cannot change an organization without changing him or herself. After all, to move others to a new place, a leader actually has to move herself as well.

I often talk with groups of aspiring academic leaders about the importance of viewing the process of leading as a learning experience. We talk about the most important source of learning being those whom we purportedly are leading. I believe this to be true, but I also have simply trusted that science can support that premise in a variety of ways. So I now want to take you back to some classic lessons from the psychology of learning and look at what they have to do with leading and with the changes in behavior that leadership requires.

Finally, I am going to share with you some anecdotes that may help to persuade you, as they have me, that addressing just one or two elements of the learning process—the effects of cognitive feedback and/or the effects of stress, will go a long way towards sustaining the effectiveness of leadership and providing for its ongoing improvement.

### Effects of Feedback on Learning

We actually know a lot about the effects of feedback on learning. I’ve told you that my work is based in behavioral theories, so you might guess that I would start with operant conditioning. People—as do rats and pigeons—repeat behaviors that are rewarded—more so on some schedules of reinforcement than others, of course. But the world of leadership is more complex than that. In organizations, we don’t have that many opportunities to do exactly the same thing again and again. Even if we did, the kinds of feedback that we receive are generally much more complex than those in the laboratory studies. One reason for all of this complexity is because the environment is nearly always characterized by uncertainty. That is the nature of leadership roles; that is *why* leaders are there—to deal with uncertainty, and to make decisions in uncertain environments. If the environment were certain, leadership would be far less necessary, and perhaps completely unnecessary. Given that, what are the important lessons about feedback and learning that are most critical for leaders?

I suggest that the most important lesson is this: **Cognitive Feedback is more important than Outcome Feedback.** In operational terms, information about relations between perceptions and environment is more important than information about outcomes. There is a great deal of research to support this statement (Balzer, Doherty, & O’Connor, 1989). It tells us that a leader really doesn’t learn very much, in the sense of learning that is reflected in changed behavior, by being told that what he or she did achieved the desired outcome—that it succeeded

or failed. In fact, there is even evidence suggesting that this kind of feedback may *interfere* with learning (Brehmer, 1980). What does support learning for a leader is information about the task, the setting, and perceptions of behaviors, including—presumably, how both the leader and others perceived the important characteristics, the difficulties, and the uncertainties involved in a situation.

This kind of feedback about perceptions is termed cognitive feedback in the scientific literature (Todd & Hammond, 1965). It is described more precisely as information "... about relations in the environment, about relations perceived by the person, and about relations between the environment and the person's perceptions" (Balzer et al., 1989). As important as it is, this kind of feedback is not always easy to get. For a variety of reasons, those in leadership roles often get very sparse feedback. When things go well, there may be a pat on the back or a few words of congratulations, but then we tend to move on to the next task. When things go badly, on the other hand, leaders are likely to get very poor, or inaccurate, feedback. Even our closest associates are likely to avoid the topic or to brush off the negative outcome, citing bad luck or some insurmountable obstacle. So it is important to think about what we can do to build in the kind of "cognitive feedback" that can make a difference—for ourselves or for those whom we coach or advise.

I want to give you some examples of situations in which cognitive feedback, or its absence, has made a difference in an individual's ability to learn and lead effectively. These examples will be heavily disguised, of course, and are composites of situations with which I have dealt, but the behaviors I'll describe have occurred in one form or another, in one person or another.

We have all seen the individual who goes along for years getting good performance reports and then is stunned when he or she is let go, or perhaps just passed over for what seemed the "obvious promotion." This can happen when feedback is focused on outcomes, rather than relations. True, it is less likely to happen when 360 degree evaluation processes are in place, but it can still happen. I'll describe one such case.

### *Situation 1*

Mark was a division director in a small technology-oriented organization. He had followed someone who had failed rather badly in the role, and he frequently reminded his colleagues of that fact. Mark was extremely "chummy" with the group for whom he worked, and took pride in saying that he always formed close friendship bonds with his work colleagues. He worked extremely long hours. His part of the business was absolutely central to the success of the company, and he knew it exceptionally well. Mark's style was unusual in some ways, however. He was fond of story telling, and his e-mail communications were always long and peppered with detailed descriptions of the people with whom he was interacting.

Mark was enthusiastic about his work, and he presented himself as something of a martyr, creating the impression that he faced huge obstacles in getting his work done—obstacles that others probably wouldn't be able to overcome. He had always received excellent performance evaluations. He thought of himself as highly effective and a real "people person." He also seemed to think of himself as something of a "wunderkind" who would be going on to better things; he often talked about those potential opportunities and asked advice of others in the company about job applications.

Then there were some changes in the group above him—the group that used his work products, and a couple of the newer people began to ask whether Mark had always talked so much about extraneous issues, such as his interactions with vendors, and other issues that they considered personal. In fact, these behaviors were not new, but no one had known how to respond to them in the past. Mark delivered the products that were so necessary, and everyone had just "put up" with his other behaviors. The fact was, however, that Mark's decisions were seen as unprofessional and even suspect because he so often entwined the reports of his accomplishments and decisions with personal stories about interactions with co-workers or clients. For example, he made no secret of what he considered a power struggle between himself and an important, but somewhat disagreeable, client, and he regularly reported in his e-mails on his ability to get the better of this individual. Mark placed a high value on what he termed "honesty." He believed it was an important part of his success—and perhaps his particular charm, that he was willing to talk about his personal responses to people with whom he worked.

Because Mark was the lead person in his area and in a unique aspect of the business, it was not immediately apparent that he was not as productive as he might have been. Besides, everyone knew he worked long hours, and they were reluctant to criticize. Some of Mark's colleagues began to tire of his stories, however, and still worse, began to believe that he was making bad decisions based on personal biases and opinions. They questioned his total productivity as well, noting that while he worked long hours, he was probably wasting a lot of time and energy, perhaps just not working very "smart."

When Mark's next evaluation included feedback about bringing personal feelings too much into the workspace, he was devastated and, indeed, felt betrayed. He believed that he had entrusted his colleagues with information about himself and about others that was useful in building the business and that demonstrated how much of himself he gave to the job. What others saw, however, was someone who made business decisions on the basis of personal and emotional, rather than rational, factors—someone who was not willing to get past his own feelings to do what was necessary, someone who did not seem to have a long-term commitment, and who just might be a liability for the company.

Mark had never before had cognitive feedback about the kinds of information he was using to make decisions or how that kind of input differed from others' perceptions of good decision-making strategies. Consequently, he struggled to make sense of what he was hearing. Mark had all the skills he needed to do an even better job, but he couldn't see that his strategies were getting in his way. He complained to his boss that it was unfair to be evaluated on anything other than the bottom line, and for a while his performance deteriorated, and he began to withdraw. He felt that he was the victim of mean-spirited colleagues and complained that they were keeping him from getting a better job. Although he desperately needed coaching, he resisted it and is still struggling to understand the feedback he received. He is a long way from seeing that he can use this feedback to improve his work performance.

In Mark's case, we can look at some fairly simple experiments related to learning and performance and see that his model for decision-making seemed to be taking into account factors other than the ones that might be viewed as relevant in an ideal model. In other cases, the link between cognitive factors and learning or performance may be less obvious. But why wasn't Mark getting any feedback about his strategies? The answer, I believe, lies in the bias that organizations tend to have about "bottom-line performance." If someone is delivering on the bottom line, it is difficult to talk about what is wrong—or even the potential for improvement. For Mark, this was complicated because there were few people who actually understood what he was supposed to deliver. With his long work hours and effusive communications, he had created a lot of smoke that suggested a huge bonfire of productivity. When new blood with different experience came into the company, however, much of his activity was seen as "just smoke."

There are other reasons, too, that leaders don't get the cognitive feedback that would be so helpful. Those who report to them don't want to seem critical, or they simply assume that those in charge must know what the problem is. Unless it actually is within the leader's repertoire to debrief after every major event or task, and to do so in a way that truly encourages and supports the input of others, that feedback is not forthcoming. This is especially true, I might add, for those "bottom-line" leaders, or high achievers, whose personal investment is so very sharply focused on goal attainment. They believe that the outcome *is* the feedback.

### *Achievement Motivation and Cognitive Feedback*

The theory of achievement motivation was the primary focus of my doctoral research. Although the field has faded some in popularity since then, a new interest in high achievers has recently emerged. In a *Harvard Business Review* article titled "Leadership Run Amok," Spreier and two of his Hay group

colleagues (Spreier, Fontaine, & Malloy, 2006) described the problems of leaders who are focused intensely on achievement goals. Such individuals are motivated primarily, and sometimes exclusively, by the pleasure of goal attainment—completing important projects or achieving specific results. These are the people that psychologists David McClelland and Jack Atkinson were writing about in the 1950's and 60's (Atkinson, 1958), as they developed a new approach to understanding motivation that was built on basic learned needs for achievement, affiliation, and power.

As we understood the relationship of motives to leadership in the last part of the 20th century, those with high achievement needs clearly were society's winners. Undistracted by social and affiliative needs, and unafraid of failure (which was conceptualized as the motive opposing the need to achieve in an approach-avoidance schema), their eyes are on the prize, and they pursue it relentlessly. Their mentality is "just get it done." When there is a goal before them, and things aren't going well, they just put it in overdrive, and they do usually "win." Countless laboratory studies have demonstrated those effects. But because society, and business as well, traditionally have placed their highest value on achievement, high achievers can be especially immune to cognitive feedback. Consequently, they are usually seen as successful and are admired for their achievements early in their careers, but as time goes by their lack of interest in working with and through other people begins to tell on them. When "how" one succeeds becomes just as important as goal attainment, those high on need for achievement (nAch) are often at a loss. They are thrilled by outcome feedback (OFR), but they just don't know what to do with cognitive feedback (CFR).

Spreier et al. (2006) pointed out the good news in this situation, too. Once these high achievers "get it"—that is, once they understand there is something other than the goal they need to learn about, high achievers will go after that as no one else can—and yes, they'll figure out how to obtain, interpret, and use cognitive feedback. The basic realization that winning is about more than personal effort is not necessarily easy to come by, however. As a result we often see these high achievers burning out, for in today's world, the winners are increasingly likely to be those who are primarily motivated by the incentive values related to affiliation and power—and particularly what we know as social power, rather than by achievement.

Perhaps I have digressed by moving into the theory of achievement motivation, but I believe that learning and motivation are inseparable. Moreover, the conditions under which we learn—and lead—are inextricably related to performance. The pressures exerted on an individual by either external forces, or internal forces such as motivation, are critical to learning and to performance. Perhaps the most powerful of those influences are the ones we describe as anxiety or stress.



## Effects of Stress on Learning

The research literature related to the effects of anxiety and/or stress on learning is voluminous, and I will not attempt to review it here. Instead, I'll describe some of the simple, standout findings from over the years. Early in the 20th century, Yerkes and Dodson (1908) demonstrated that mice stressed by increasing levels of electric shock learn an escape task most quickly when the shock levels are moderate, but that at both low levels and at the most intense levels, learning drops off and the animals persist in non-productive behaviors. That inverted u-shaped curve for learning under conditions of anxiety became familiar to virtually every student of psychology over the next hundred years, notwithstanding a great deal of debate about the findings. Attempts at replication have produced variable results, and a number of theories have been offered to describe how humans, as well as animals, respond to learning under situations of anxiety or stress. It does seem to make sense that some level of anxiety or physiological arousal is productive, while too much can interfere with performance, but more recent research suggests that it is far more complicated than that. It turns out that there are many factors that moderate the effects of anxiety or stress on learning, and I'll describe just a couple of basic principles that are reasonably well supported and that seem to be easily translated to the practicing world of leadership.

Rather than describing particular studies in this area of research, I refer you to an excellent and relatively recent review of the literature on stress, cognition, and human performance produced by a NASA psychologist, Mark Staal (2004). With the caveat that the findings of virtually every study of stress and learning must be qualified in terms of the type of stress involved and the type of learning involved, as well as design and methods, we can nonetheless make statements such as the following: **High levels of stress generally result in impaired ability to learn, impaired memory, and the tendency to rely on better-learned behaviors, rather than newer ones—even when the new ones are clearly more effective. Moreover, individuals under stress tend to be more rigid in their decision-making, to consider fewer alternatives, and to resort to familiar strategies, even when those strategies are failing.**

I daresay that none of these findings truly surprises those of you who work with leaders in high-stress situations, or who have been able to view objectively your own similar behaviors under stress. Nonetheless, I find that looking back at the research and reading those studies provides me with confidence in my attempts to help others threatened by these negative effects on learning—and leading. It also prompts me to ponder the truly devastating effects that stress can have, not only on performance of specific tasks and on decision-making, but on the health and lives of individuals in leadership roles.

I have seen people do incredible things under pressure— things they later look back on in dismay. “I knew better,” they will say, “but I couldn’t stop myself. I had to do it.” Others have told me that they made bizarre, or just

plain stupid, decisions in the face of obvious evidence that suggested a more rational course— decisions about things that range from the trivial to those of the greatest import.

### *Situation 2*

The president (I'll call her Susan) of a non-profit agency with which I worked had been under a great deal of stress related to extra workload created by employee turnover, increased demands brought on by legislative changes affecting the organization, and complicated by conflict on the agency's Board of Directors. One of the directors rarely interacted with Susan outside of Board meetings, but would take those public opportunities to criticize her and the organization, forcing others on the Board to take sides. Each meeting turned into an impromptu hearing on some issue for which Susan and her staff were unprepared. Eventually, the situation came to the attention of one of the local newspapers, and reporters began to attend the Board meetings. Others on the Board were urging her to ignore the director who was so relentlessly critical, but she found this increasingly difficult to do. Although some of the work issues were beginning to be resolved, the now public nature of this opposition to her leadership became intolerable. Susan announced her resignation very suddenly at a Board meeting.

In reflecting on the situation, Susan told me that she had not known she was going to resign until she was saying the words. She said that she had felt tension building in the room as the difficult Board member began to talk, and she developed what now seemed a completely unrealistic sense of the importance of taking dramatic action in that moment. Later, she deeply regretted the action. She told me that just prior to that time she had both said and done a number of things that she could not now explain. She found herself doubting the information that was given to her by highly reliable direct reports. Sometimes she could not remember what she had told someone the day before, and she had missed several important appointments. She couldn't concentrate, and she couldn't sleep. In the aftermath, she could see that— objectively speaking— the situation was not as bad as it had felt to her, and that she could have used her positive relationships with other Board members to develop a strategy for managing the difficult one. The available options were now clear, although the day she resigned, she had been totally unable to see them. Susan's responses are not surprising, however, in light of what the research has told us about the effects of stress.

I have known others in similar situations, incidentally, who did not respond to this kind of stressful situation in the way that Susan did. Most of them were individuals who found a sense of challenge in the situation, who would not have experienced the Board member's attacks as personal, and who would be comfortable in bringing others more closely into their circles as allies.

They almost seemed to grow stronger and more confident in the face of such opposition. But the attacks did seem personal to Susan, and they eroded her sense of self-efficacy. They eroded her cognitive and emotional resources as well. She suffered many of the debilitating effects of stress that have been described in the literature. Her attention was inappropriately tunneled, and her memory was impaired. She felt unworthy of the support of others, and her sense of leadership was virtually destroyed. When Susan most needed to be seeking the support and counsel of others and focusing on potential positive outcomes rather than negative ones, she was unable to do so. Unfortunately, these responses to stress are not unusual, and they can be even more extreme.

### *Situation 3*

The front page of a recent edition of the *Chronicle of Higher Education* bore the following headline, "How Relentless Stress Claimed a Leader's Life" (Fain, 2007). The accompanying article was about the Chancellor of the University of California at Santa Cruz, who committed suicide in the summer of 2006 by leaping from the top of a 42-story building in San Francisco. The chancellor had been in that role for only 16 months, but it was a time filled with student protests, faculty criticism of leadership, and impatient, relentless demands for immediate changes in a variety of university policies and procedures. Those would make for stress in any university leader's life, but this chancellor was young at only 46, and had come to the position from a deanship, having skipped the traditional step of provost or vice-president. Add to that the fact that Santa Cruz is a small and inward-looking community. Anyone in a prominent position lives in a fish bowl, and even a chancellor's trip to the grocery store can wind up in the newspaper. This chancellor's life was filled with media events.

From the moment she was appointed chancellor, Denice Denton was front-page news in the *San Francisco Chronicle* and other California papers, as well as the Santa Cruz and university media outlets. Although she had been treated no differently than dozens of the University of California's male chancellors before her, her salary, renovations to the university residence, and her lesbian partner's well-paid new University job were publicly scrutinized, debated, and criticized. Her appearance, her dogs, and her private life in general, were the subjects of often-derisive public comment. At first heralded as "the perfect match" for Santa Cruz, Denice Denton was soon attacked and mocked by the same groups whose causes she had long championed. Within 16 months, this outstanding academic engineer and much-heralded new chancellor, who had risen rapidly through the faculty and administrative ranks at some of the best universities in the country, was reduced to incapacitating depression and finally, suicide. Certainly, no job is worth that. The *Chronicle of Higher Education* reported that it was the first known suicide of a sitting university president or chancellor. And yet, the signs suggest that we could see this again.

There is a tendency to believe that the work life of universities is less demanding than that of the corporate sector, but I would be the first to disagree, and I do have some experience with both worlds. The demands on leaders of large public universities are especially complicated by several factors. First, they answer to too many constituencies, any one of which can undo them. Second, by virtue of tradition and the tenure system, they have no direct control over the quality of their products or those who create them; and they may have no control over revenues either— although they are perceived to control both and are held accountable as if they did. And third, in addition to the usual demands of executive positions, they have endless after-hours social responsibilities linked to friend raising and fund-raising on behalf of the university. University presidents essentially invented the 24/7 commitment.

### *Extreme Ways of Working*

A recent article in the *Harvard Business Review* suggests that we are seeing an increase in this type of position. Termed “extreme jobs” by authors Hewlett and Luce (2006), they are high-paying positions typically involving more than 60 hours of work per week and also characterized by a number of pressures— most important among them unpredictable work flow, fast-pacing with tight deadlines, and responsibilities outside of work hours, including 24/7 availability. These positions tend also to involve profit-and-loss responsibility and extensive travel commitments, as well as large numbers of direct reports. In spite of the fact that 60% of those holding such jobs report that their work interferes with their relationships with their children, and about half say it interferes with their relationships with their spouses, and particularly their sex lives, they are hooked.

Although I have no data on this point, my guess is that those high achievers I talked about earlier are over-represented among these extreme job holders, because achievement striving has some of the same addictive qualities that have been described in extreme job holders. In both cases, we are talking about what is sometimes called the “workaholic”; it just happens to be more highly remunerative in the case of the “extremes.” In both cases, I am guessing that these are people whose greatest rewards come from personal goal attainment, more than from interactions with others or from social activities. Whether the new “extreme” ways of working result inevitably from demands created by new communications technologies and the global economy, or whether they reflect a form of addiction to the adrenaline rush created by the setting and its demands, science has long told us that these ways of working are not good for people—and probably not good for the companies for which they work either. If you know and work closely with individuals in extreme jobs, you’ll start to see the telltale signs of performance decrement: memory loss, missed appointments, and often irritability and inappropriate behaviors at work. The research on learning tells us clearly that stress creates just such responses.

Hewlett and Luce (2006) pointed out that the pace required by these jobs cannot be maintained over the long-term, and they also note that women are far less willing to devote the hours, even if they are willing to tolerate the stress—thereby eliminating an important source of talent for the organizations that depend on such jobs. Yet people seek and take on extreme jobs, and they thrive on them—at least for a while. The kinds of responsibilities and work demands that these jobs entail are the very definitions of stress, and they will eventually take their toll.

The theories of Canadian endocrinologist Hans Selye (1976, 1985), are particularly relevant here. Selye described the General Adaptation Syndrome, or a non-specific physical reaction to stressful events of all kinds, both positive and negative in impact. He asserted that all stresses, or challenges, require that our physical body systems first become excited and prepare for action. This is the arousal stage, which is then followed by a second stage of resistance. In prolonged stress, a third stage follows and involves the exhaustion of one or more body systems. This last stage translates into wear and tear on our bodies, making them more vulnerable to opportunistic illnesses. Selye believed that all stresses result in damage to the body and that, over time—whether one enjoys the experience or not, running continuously in high gear will also contribute to the kinds of decrements in learning and performance that have been noted by psychologists studying learning in the laboratory. Selye's theories have undergone a lot of adaptation of their own, and we eventually began to hear more about the hypothalamus-pituitary-adrenal system than the General Adaptation Syndrome. The debate about just how these processes work continues, but the basic notion that prolonged stress of any kind can create a variety of physical problems is now reasonably well accepted in medicine.

How one reacts to stress is important, of course, and there has been plenty of research on that topic as well. Lazarus and Folkman (1984), and later Dienstbier (1989), emphasized the importance of cognitive processing related to stressful events and helped to explain why some individuals seem more resistant to the negative effects of stress than others. Some individuals experience most work-related pressures and stresses—even those of the extreme jobs, as positive challenges, rather than negative and threatening events. This suggests that it is not just a matter of how many stressful events we are experiencing, but rather, how stressful we perceive those events to be. Both personal and social interpretations play a role in reactions to work challenges, but there are no interpretations to negate completely the physiological effects of stress on the body.

In attempting to sum up what science has taught us about the effects of stress on performance, learning, and leading, I would offer you this: Stress is in the eye of the beholder, but it also is in that beholder's body. Experience tells us that there is a limit to human endurance and probably even a limit to the capacity of the brain to deal with continuing new demands. When working

as managers and leaders, we owe it to ourselves to begin understanding those limits, to acknowledge when we are experiencing a work demand as positively challenging, and when we are experiencing it as unwelcome stress. As psychologists working with leaders, we need to help them to do the same. Only if we are able to recognize stress can we begin to manage the situation that has created that stress.

### Feedback and Stress: How are They Related?

This discussion takes me back around to where I started with the science of the psychology of learning—that is, with cognitive feedback. Cognitive feedback is important not only because it helps us to choose and shape our behaviors as leaders, but also because it helps us to understand how we are responding to the work demands and the stress in our lives. Some of the early models for studying performance in the context of decision-making focused on comparing the strategies used by individuals with some ideal strategy—which could be one described in advance by the participant himself. After involvement in a task, individuals then were asked to assess how well they were doing at applying the strategies that they articulated earlier. When task difficulty levels or other forms of interference added stress to the tasks, performance inevitably was impaired—both in terms of successful completion of the task and in terms of constructive interpretation of cognitive feedback. Stress, in these cases, then both *is* cognitive feedback and a factor that *interferes* with that feedback. This is extremely important for understanding the stress value of various demands in a work setting.

In thinking about the loss of an important young University chancellor to the stresses of an impossible job, I cannot help but wonder whether Chancellor Denice Denton had any real help in dealing with what she was confronting. There has been no indication that she did. It was said that she had never before faced a situation in which she had not excelled, and there is no reason to think that she could not have excelled in this one as well. It appears that Denice Denton may have needed desperately cognitive feedback of the type I have been describing, and I believe that she could have made extraordinarily good use of such feedback—had the levels of stress she was experiencing not interfered so completely with that learning. Perhaps more than many, she was a person of such stature and mystique that others dared not offer feedback, and also dared not offer support. We don't know, and now we never will.

In closing, I want to focus again on the proposition that the science of psychology has a great deal to offer us, both as leaders and as consultants. It provides important clues for understanding performance in leadership roles—and clues for learning how to improve that performance. In the space of this paper, I could share with you only a few of the intrinsically interesting and exciting

studies that I uncovered in my journey back to my roots in the psychology of learning. Of necessity, I have glossed over some important findings to which we should all attend, but I hope I have left you with the same excitement that I felt about rediscovering important knowledge that is available to us. It would be a mistake to think that we are good enough without it. It would be a mistake to think that clinical skills, our experience, or our well-honed intuition about how to work with people are enough to get the job done. So I would encourage all of us to take a review course from time to time—not just another course focused on the latest trend in coaching or a new way of assessing work styles, but a course in some scientific aspect of our field of psychology. If nothing else, it will remind us that psychology is not only a practicing art; it is an academic discipline that is firmly grounded in science.

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