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Aligning Performance: The End of Personnel and the Beginning of Guided Skilled Performance[**]

For almost twenty years researchers have predicted the end of personnel as HRM practices increasingly became a line management function. However, while useful for describing shifts in human resource responsibilities, this practice-based view obscures the fundamental strategic reason for this shift – executive demands for effective means to manage performance. This paper contributes a new approach for HRM that may better predict which current practices will be most successful and suggests the characteristics of new practices that may be developed using an example of goal-setting and performance appraisal. The theory includes a model of human performance based on recent advances in cognitive neuroscience that suggests HRM may fulfill a strategic role by reestablishing its core competence as specialists in industrial psychology who create systems for guiding skilled performance. We conclude by proposing a measure that assesses the link between performance and customer perceived value across the value chain, thereby demonstrating the return on investment in human resources.

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Introduction

Prior theory suggests that the strategic value of human resource management is determined by the fit between HRM practices and environmental forces (Guest 1999; Porter 1980). While useful for describing the benefits of human resource programs, this practice-based view fails to meet practitioner demands for prescriptive approaches to improving performance. Consequently for almost twenty years researchers have been predicting the demise of the human resource function as line managers, who are directly responsible for performance management, were asked to take a more active role in human resource matters (Cunningham/Hyman 1999; Schuler 1990; Whittaker/Marchington 2003). This prescriptive approach changes the focus of HRM from monitoring or tracking tangible assets to aligning and improving behaviors with an emphasis on creating customer value (i.e., revenue and productivity increases). Increasingly hypercompetitive markets (D'Aveni 1994) require that organizations view human capital as more than mere assets – a type of inventory, to be acquired, counted, and maintained. Instead, human resources must be seen as dynamic stocks and flows of individual competencies and relationships that combine to form flexible configurations of organizational capability necessary to address rapidly changing strategic requirements (Black/Boal 1994). By facilitating the alignment of organizational activity with performance requirements, HRM becomes a mechanism for developing inimitable resources that are considered the building blocks of competitive advantage (Barney 1991). This behavioral perspective on HRM suggests that expertise in the application of psychological research to developing contingent methods "to elicit and control employee attitudes and behaviors" (Wright/McMahan 1999: 57) is the basis for strategic action.

The purpose of this paper is to propose a theory of cognitive action which alters the role of HRM from managing practices to managing the capabilities and mental capacity of the entire strategic value chain. This cognitive view of HRM addresses several problems with prior approaches to linking human resource practices with organizational performance (Cascio/Aguinis 2005). First, prior theories do not predict which processes or practices will determine the most effective means to accomplish organizational goals (Dyer/Reeves 1995) because they lack a theoretical framework that explains how personnel strategies guide mental efforts in the direction of improved performance. By proposing a cognitive action view of HRM we may be able to better predict which method will be most successful, but more importantly can suggest characteristics of new methods that may be developed to increase the mental capabilities and consequent performance of employees, contractors, partners, and customers. Second, a tangible asset view of human resources positions HRM alongside other non-strategic asset management departments – procurement, records management, and facilities management – who are responsible for monitoring the status of important organizational assets. Conversely, a cognitive action approach makes HRM responsible for the most important and perishable of organizational resources – individual and organizational attention – that is necessary to sustain effort and increase productivity. Accordingly, we propose that the cognitive action approach suggests a need for new methods to determine when and where HRM systems should be developed. We briefly discuss examples of new methods for assessing underperforming or-

ganizational units and assessing motivation levels resulting from emotional arousal. Finally, asset-based theories propose a retrospective, protective role for HR that may create barriers to accomplishing strategic goals. Alternatively, the cognitive action view directs HR practitioners towards prospective objectives that support creating human resource advantages important to organizational leadership. We introduce the concept of guided skilled performance as an approach to creating positive organizational behavior (Cameron/Dutton/Quinn 2003) which links HR practices with competitive advantage.

This paper begins with a brief overview of the literature suggesting the need for a new approach to strategic human resource management. We then propose a model of human performance based on recent advances in cognitive science that supports the need for a new approach to understanding the effect of HR initiatives on organizational outcomes. We conclude the paper by exploring the implications of this theory of cognitive action for the role, function and training of HR managers.

Practice-based vs. cognitive action-based theory of SHRM

In this section, we will discuss the literature supporting a cognitive action-based view of human resource management within the prescriptive framework of goal setting and performance appraisal processes. Recent research in cognitive science supports the hypothesized impact of a cognitive action-based view on performance outcomes. Further, these studies show that a cognitive action-based view provides a better explanation for why SMART goals – those that are Specific, Measurable, Attainable, Relevant and Time-bound – are more effective than "do your best" goals. Similarly, cognitive action-based performance assessment is consistent with normative theory that suggests developmental feedback is more effective than individual critique in facilitating organizational learning and individual attainment of mastery-level performance. We propose a model of human performance that explains how organizational values, beliefs, attitudes and aspirations are transformed into abilities, effort, and behavioral outcomes.

In a recent study, Bersin (2006) suggests that performance management systems, including goal setting and performance appraisal, link human resource management with firm strategy. However, Barney (1986) suggests that use of such common practices may not result in competitive advantage. Is performance management a common practice as Barney (1986) suggests, or does the activity of performing goal-setting and appraisal differ sufficiently among firms to form the basis of competitive advantage? Can HR be a strategic partner to line management simply by using these practices to achieve goal alignment (Ulrich 1997)? Questions such as these require that we understand not simply what functions comprise each HR practice, but how these practices affect individual and group cognition.

In addition, can we be certain that performance management systems in practice properly address issues of goal setting? Cascio and Aguinis (2005: 84-87) discuss the applied or practical issues in performance management. They point out that various barriers limit effective implementation of these practices in work settings. Congruence with organizational strategy requires such systems to align employee behaviors with organizational goals. However, while it is assumed that programs of performance re-

view will improve results in the future, it is possible that in practice many of these programs are mere formalities and have little to do with goal setting on any meaningful level.

The objective of performance management systems is to identify, measure, and develop the performance of individuals and teams while aligning individual and organizational goals (Aguinis 2007). These fundamental HR practices are expected to facilitate competency development (Lado/Wilson 1994), collaborative relationships with customers (Bowen, 1986), and transformation into a capabilities-based competitor (Stalk/Evans/Shulman 1992) – outcomes that are predicted to be essential components of resource-based competitive advantage (Lado/Wilson 1994; Ulrich/Lake 1990). Yet, research has also found that these systems may result in increased uncertainty, distorted feedback, and dissatisfaction with the effectiveness of the program (Meyer 1991). Despite over forty years of research on how to make goals more effective (Locke/Latham 2002; Locke et al. 1981), some performance management systems continue to measure the wrong things, decrease rather than increase performance, and result in biased appraisals (Latham et al. 2005). Thus, the fundamental HR practice of performance management appears to be missing the critical ingredient that connects goals to performance and aligns personal aspiration with organizational vision.

According to goal setting theory, organizations that follow the practice of setting SMART goals (Mourier 2000) will outperform organizations setting "do your best" goals. However, simply setting SMART goals may not be sufficient. Cognitive psychologists have found that performance outcomes varied widely based upon the process by which individuals establish their intentions to perform an action (Gollwitzer 1993). Additionally, the selection of strategies to accomplish a goal may be determined by unconscious processes responding to non-verbal and environmental cues (Bargh 1990; Bargh et al. 2001). Consequently, the outcomes of goal-setting or performance appraisal are predicted not by the practice method that is used, but rather by the structural elements of the organizational context (Giddens 1979, 1984) that trigger intentions and unconscious action.

Recent findings from cognitive neuroscience research suggest that SMART goals, consistent with predictions of expectancy theory (Vroom 1964), increase the conscious awareness of a discrepancy between valued and actual performance outcomes (Custers/Aarts 2005), but only when accompanied by the unconscious arousal of emotions will SMART goals result in decisions to change behavior (Sanfey, Rilling, Aronson, Nystrom,/Cohen 2003). These findings are consistent with a theory that goal-directed behavior occurs through the establishment of an implementation intention that automatically pushes a goal into working memory in response to environmental cues (Gollwitzer/Bargh 2005). This form of goal enactment is called *prospective memory* to differentiate it from the *retrospective memory* associated with retrieval of past events or factual knowledge. In a summary of this research, Guynn (2003) reported that prospective memory is best modeled as a dual process in which the strategic monitoring of a goal in conscious awareness is separated from automatic performance of intentions and plans by unconscious processes. Thus, a theoretical model based on an interaction between conscious thought and unconsciously directed action best ex-

plains and predicts effective goal-setting practices. However, as Weick noted, the actions may actually precede and more effectively predict goal-directed behavior:

> *Goal consensus is not a precondition of order and regularity*… It is probable that goals are tied more closely to actual activities than has been realized, and that they are better understood as summaries of *previous* actions…(Weick 1969: 37)

Consequently, the actions performed by individuals and the goals they elicit are better predictors of performance than the use of a particular HR practice such as setting SMART goals. Organizations using SMART goals may outperform those using "do your best" goals both because their specific, measurable and attainable characteristics evoke conscious attention while their relevance, time urgency and difficulty of the tasks involved evoke emotional arousal and corresponding effort towards accomplishing the goal.

Like goal setting, performance appraisal is a common HR practice that differs in the degree to which it pertains to specific employee actions. Prior research suggests that the link between goal setting and performance is moderated by the effects of feedback (Becker 1978; Fellner/Sulzer-Azaroff 1984; Locke 1996). Increases in self-efficacy (Bandura 1997) occur as individuals achieve goals and receive positive feedback. Frequent and recurring feedback regarding goal accomplishment has been associated with development of proficiency in a task and a sense of personal mastery (Peterson/Arnn 2005). However, performance appraisal even when provided in a constructive and positive tone does not seem to improve performance unless it is "behaviorally specific…identifying those high-leverage behaviors that can be improved and providing guidance on how to do so" (Baron/Kreps 1999).

Recent evidence from cognitive neuroscience provides explanation for why action-specific feedback is more effective than an overall appraisal of performance. Research on attention and adaptation processes underlying task performance has shown a similar dual process as that functioning during goal activation. On one level, attention is re-directed based on action-centered feedback when such action is the focus of attention. A different neural network associated with unconscious processing is triggered when feedback relates to goal selection, i.e., the value of choosing one goal over another (Dosenbach et al. 2007), and may have a greater impact on behavior change over time. Furthermore, neuroscience studies of the incentive-motivation links confirm that the motivational effects of feedback relate to two distinct mental processes modulated by the availability of programmatic response patterns, or mental scripts (Joel 1999). In a comprehensive review, LaBar and Cabeza (2006) found substantial evidence supporting these two distinct neural pathways affecting goal-directed behavior – a consciously-driven neural network effected by valence (positive vs. negative emotional response) and an unconsciously-driven neural network effected by arousal levels. Finally, neuroscience research into purchasing decisions suggest that effective performance feedback must clearly state the connection between current actions and long-term expectations and rewards (Knutson et al. 2007).

In the next section, we present a model of human performance based on the research from cognitive neuroscience which may be used to develop a set of propositions that explains how and why HRM practices may or may not improve performance. By understanding how individual cognition converts values into behavior, we

can predict the type of actions that will tend to produce alignment between individual and organizational performance. Following this section, we will discuss the application of this theory to job analysis, workforce planning, recruitment, selection, compensation, training, and performance management. Consequently, the model supports an integrative approach to HRM. We suggest such an approach enables leaders to manage "the white spaces" in an organization by enabling groups to perform collaboratively, thus yielding increased performance at the organizational level (Rummler/Brache 1995).

V-to-B loop: A neuroscience model of performance

The recent findings in cognitive neuroscience enable development of a model for human behavior that can explain and predict how and why HR practices affect performance by directing the effort expended on specific actions. As shown in Figure 1 below, we use the metaphor of an iceberg to signify the important difference between conscious, preconscious and unconscious processes. The waterline represents the gray area between conscious and unconscious activity that is associated with mental processes that a person can sense but not fully describe, and as such are labeled "preconscious" cognitions. The further removed from the surface, the more our internal processing becomes tacit (Polanyi 1967) and the likelihood increases that our verbal reports may not match actual behavior (Argyris/Schon 1974).

The model depicts a process by which values direct attention through emotive response that determines goals and plans. Emotion is shown as having two components. A cognitive appraisal of valence determines an orientation of approach or avoidance towards a goal (Boekaerts/de Koning/Vedder 2006; Judge et al. 2005). The activation level of a goal, which we propose *as a neurological definition for the motivation construct*, is determined by the level of emotional arousal by which core values are associated with the goal. Active goals are selected in accordance with conscious plans or unconscious scripts recalled from memory. Cognitive psychologists refer to implementation plans as prospective memory (Gollwitzer 1993; Gollwitzer/Brandstatter 1997) and refer to cognitive scripts as procedural memory (Markowitsch 2000). Prospective memory orients attention towards taking specific action while procedural memory may either unconsciously trigger behavior or alert attention to the need for deliberate action. This process may be repeated if the outcome fails to meet expectations and thus causes re-evaluation of goals, plans and actions. Consequently, we refer to this model as the Values-to-Behavior Loop.

As depicted by the placement of the boxes in Figure 1, people are not fully conscious of their values and attitudes but only the output of these processes in verbal behavior – as Weick (1979: 155) said, "How can I know what I think until I see what I say?" Based on a preponderance of evidence from cognitive neuroscience (Anderson 1983; Bargh 1989, 1997, 2004; Gollwitzer/Bargh 2005; Shiffrin/Schneider 1977), the model predicts that behavior is less determined by conscious effort than by scripted response. Behavior change is also generally outside conscious control. The response to feedback in altering values seems to be influenced more by emotional contagion (Barsade 2002; Hatfield/Cacioppo/Rapson 1994) and institutional effects (Douglas 1986).

Figure 1: The V-to-B Loop Iceberg drawing,
      adapted from http://en.wikipedia.org/wiki/File:Iceberg.jpg
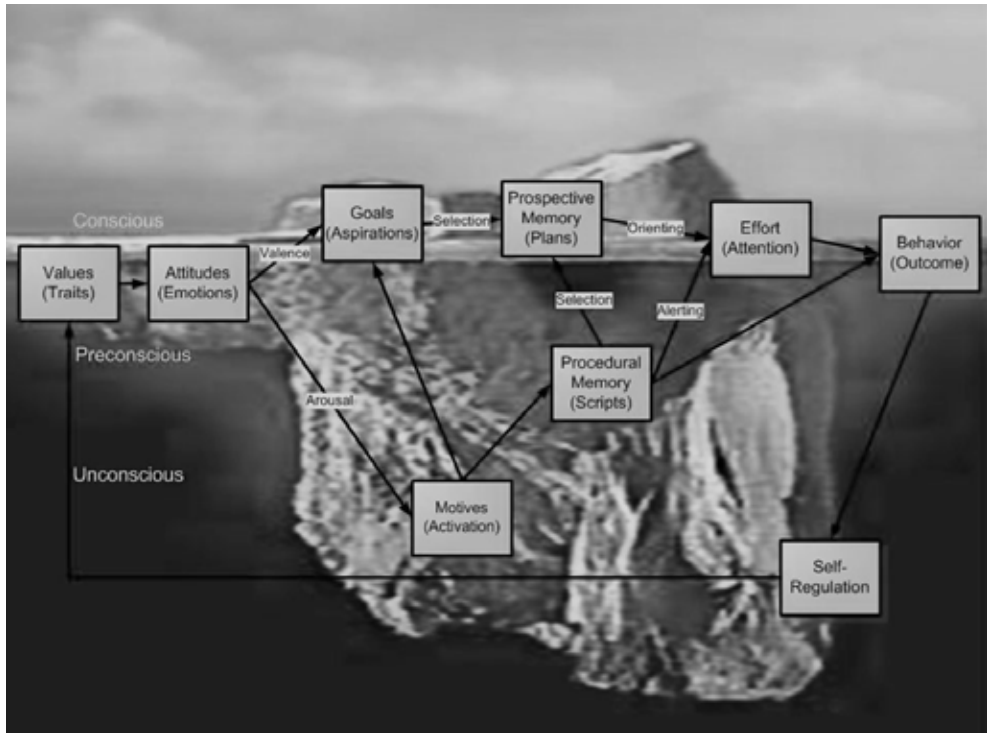
Finally, and perhaps most importantly for human resource management, cognitive scripts determine the degree of conscious effort to be exerted during performance of goals. The model shows that emotional arousal may be addressed either by activating goals in consciousness or by triggering automatic behaviors. This implies that under conditions of high stress, individuals with more appropriate scripts are likely to out-perform those who must deliberate prior to taking action. Such deliberation is expen-sive in terms of cognitive resources (Miller 1956). Consequently, HR practices that evoke values, attitudes, implementation plans, and effective cognitive scripts that are appropriate to direct effort in producing the desired behavior are going to be the most successful, especially in hypercompetitive markets that strain employee attention and increase stress levels. Prior research has shown that a fundamental set of cognitive script building blocks, called *thinkLets* (Briggs et al. 2001; Tobey 2006, 2008) underlie skill development. Moreover, thinkLets enable predictable and repeatable perform-ance on a task. Thus, by eliciting, encoding, and systematizing the use of cognitive scripts throughout a value chain human resource managers can guide skilled perform-ance throughout an organization.

     In the next section, we develop a set of propositions using the Values-to-Behavior Loop model to achieve performance alignment across the entire value chain (Porter 1985) – from suppliers through internal operations to penetrating deep within customer organizations. We begin with a review of the practice-based view of HRM

which seeks to develop organizational capabilities (Ulrich/Lake 1990) that are valuable, rare and inimitable human resources in order to create competitive advantage (Barney 1986). We then contribute an alternative model based on identifying the core actions and systems which best leverage and align human performance across the entire value chain. Finally, we introduce a new metric, the Salary Coverage Ratio (SCR), which links human performance with simple and quantified measures of customer perceived value. The SCR is proposed as key performance indicator for assessing the return on human capital and enabling benchmarking of teams, departments and divisions both against each other and against best-of-breed organizations across multiple industries.

V-to-B: Integrating HR across the value chain

Unlike prior theory which assumes the primacy of conscious action, the Values-to-Behavior Loop (see Figure 1 above) is based on recent advances in cognitive neuroscience that suggest behavior is driven more by subconscious goals, habits, and emotion than conscious will. Therefore, the focus of strategic human resource management should not only include conscious commitment (Ulrich 1997), but also the alignment of goals, structure, ability, and process found to be essential for producing the highly customized products (Pine 1993) required by hypercompetitive markets (D'Aveni 1994). In this section, we will review several normative, practice-based theories of strategic human resource management (SHRM) which seek to create valuable, rare and inimitable human resources that result in competitive advantage (Barney, 1986) through the development of a set of unique capabilities. We then apply the V-to-B Loop model to develop a set of predictions regarding how organizations may create competitive advantage through a cognitive action-based view of SHRM. We will conclude with some recommendations on altering the normative models assuming our propositions find support in subsequent empirical research.

The last decade of the 20th century could have been called the "Age of Competence" because it began in the summer of 1990 with two seminal works. First, Prahalad and Hamel's (1990) article "The Core Competence of the Corporation" appeared in the May-June issue of *Harvard Business Review*. Then in August, Ulrich and Lake (1990) released their book, *Organizational Capability* (New York: John Wiley/Sons). At the same time, Schuler (1990) issued a call to HR practitioners for "Repositioning the Human Resource Function" that appeared in the August issue of *Academy of Management Executive*. Also appearing the same year was Stalk/Hout's (1990) *Competing Against Time* (New York: Free Press) which suggested a capabilities approach that was used by several companies reported in Stalk, Evans and Schulman's (1992) *Harvard Business Review* article "Competing on Capabilities."

Note that the growth of competency models in the management literature reflects these capabilities at both the individual and organizational level of conceptualization. Competencies are a multi-faceted and complex set of issues in organizational measurement, as seen in such sources as Boyatzis (2006) and Intagliata, Ulrich and Smallwood (2000). At this point we are primarily discussing the organizational level, and later we describe competencies for individuals within the organization. We propose that these levels do combine in complex ways beyond the scope of the present

paper, and note that our model for measuring the action-performance link discussed later in this paper assumes certain parallels across levels of measurement.

Prahalad and Hamal suggested that unlike many other forms of competitive advantage, core competence enables increasing returns to scale, thereby increasing in value with each and every use. They believed that core competence would be dependent upon configurations of technology, skill, intra-organizational coordination, and learning that would be difficult to imitate and contribute to perceived customer benefits. They defined core competency as:

> the collective learning in the organization, especially how to coordinate diverse production skills and integrate multiple streams of technologies… Core competence is communication, involvement, and a deep commitment to working across organizational boundaries (Prahalad/Hamel 1990: 82).

Prahalad and Hamel viewed HR's role as facilitating the movement of expertise across organizational boundaries, through improving communication and instituting job rotation. They feared strategic business unit structures would lead to knowledge hoarding and underinvestment in competence development. Their strategic viewpoint later would become known as the knowledge-based view of the firm (Grant 1996), where, "[t]he benefits of competencies, like the benefits of the money supply, depend on the velocity of their circulation as well as on the size of the stock the company holds" (Prahalad/Hamel 1990: 87).

Prahalad and Hamel introduce the critical concept of stocks and flows by which knowledge resources are assessed value. Yet, this dynamic view of capabilities is very different from the practice-based view of HR that counts the stock of tangible human assets in the form of job skills, diversity classifications, occupational health statistics, headcount reductions, and leadership development programs that comprise what would later be described as IBM's "distinctive competence" in human resource management (Ulrich 1997: 97). Furthermore, HR managers that followed Prahalad and Hamel's recommendation that knowledge hoarding be combated by using the practice of job rotation, often found that knowledge transfer didn't happen (Szulanski 1993, 1996). Rather than facilitating the flow of knowledge as Prahalad and Hamel recommended, HR practices supported by state-of-the-art technology sought instead to "personalize service by encouraging *knowledge* work to flow to the *least expensive* human resources" (Ives/Jarvenpaa 1993, emphasis added). By the end of the decade, the founders of the U.S. award for competitiveness, *The Baldridge Award*, would decry "If Only We Knew What We Know" (O'Dell/Grayson 1998).

A cognitive action-based view of human resources would take a very different approach. Rather than simply moving bodies around like one might do with a machine in a flexible manufacturing line, HR managers would first identify the collection of tools, behavioral scripts and interpersonal interactions that were associated with expert performance (Briggs et al. 2001). The V-to-B Loop informs us that these activity patterns are situated in a context that is essential for their production (Suchman 1987), as without the contextual cues performance must again become deliberate and therefore less productive. Consistent with Prahalad and Hamel's advice, we suggest a cognitive action-based HR manager recognizes that *information is only valuable when it moves*. However, since knowledge is embedded in context, activities would be relocated

to where knowledge resides through creating adhocracies (Waterman 1990) and virtual collaboration environments (Weatherall/Nunamaker 1999) that encourage activity to flow to the *most valuable* human resources. Aligning organizational processes with the contexts where skilled performance occurs facilitates the values to behavior translation, thus making performance more productive. More importantly, by facilitating the use and development of tacit knowledge, this approach also increases the difficulty of imitation by competitors while decreasing the knowledge transfer problems internally. Consequently, their resource advantage should not only be maintained, it should increase. Accordingly, we propose:

P1: Organizations that manage cognitive action through developing scripts that guide skilled performance will outperform organizations using traditional knowledge management practices with increasing returns to scale.

Ulrich and Lake (1990) proposed that organizational capability consists of four critical elements: shared mindset, management and human resource practices, capacity for change, and leadership (53-54). Like Prahalad and Hamel, they suggest an emphasis on the boundaryless organization (Ashkenas et al. 1995) in which HR creates value directly for customers (Bowen 1986). To become a "human resource champion" (Ulrich 1997), they suggest HR efforts be directed towards improving management practice and satisfying customers. Ulrich and Lake (1990) define management practices as "processes and approaches any manager uses that affect how people think, behave, and do their work" (77). This model of management practices suggests that competencies can be

- *generated* through personnel development or recruitment and selection
- *reinforced* through performance appraisal and rewards
- *sustained* through organizational design and communication

Finally, Ulrich and Lake (1990) believe that defining competitive advantage in terms of competitive forces within an industry fails to explain how strategies are enacted, and they propose organizational capability as "the means through which the organization implements policies and procedures to develop and sustain employee commitment" (39, emphasis in original). Ulrich later added a concern that

> increasing attention has been paid to the importance of moving HR professionals into the strategic role. But in answering the call to become "more strategic" and "more involved in the business," many HR professionals have inappropriately identified this as the only HR role… Some of these articles may have fallen into the trap of discounting the operational part of HR in the quest to be strategic (27 and endnote).

Ulrich and Lake (1990) provide a normative model of SHRM that extends the Prahalad and Hamel framework beyond intra-organizational boundaries to embrace HR involvement in the customer relationships, defining the strategic value of HR practices on the basis of revenue production and customer satisfaction – two criteria that senior executives would likely also list as central to business performance. They also extend the definition of competency to address the means, or actions, to effect the changes necessary to achieve superior performance. However, as Guest (1999) noted in a review of the strategic capabilities literature, normative theories assume that high employee commitment would lead to superior performance and have not differentiated

the behavioral outcomes which mediate this relationship. Furthermore, a meta-analysis of organizational commitment found that "commitment has relatively little direct influence on performance in most instances" (Mathieu/Zajac 1990: 184).

A cognitive action-based approach permits exploration of the relationships between HR practices and behavioral outcomes and therefore may be able to better explain the role of HR in improving performance. While enabling better prediction and improved understanding of every element of competency management, a cognitive action approach may be most beneficial for establishing the first of the three competency management processes proposed by Ulrich and Lake (1990): the generation of competencies through development and selection.

Ulrich and Lake (1990) propose that one way competencies may be generated is through developing new competencies in existing staff. The V-to-B Loop offers an explanation for how this may occur by identifying the antecedents and consequents of procedural knowledge. These scripted collections of *thinkLets* form the basis for the development of task proficiency. According to this model, cognitive scripts form when goals associated with high states of arousal overwhelm conscious resources causing outcome failures. As self-regulation processes begin to re-organize neural operations to support future performance, scripts are stored that can offload processing and become increasingly refined through repeated trials (i.e., practice). However, if arousal is relatively low, environmental cues necessary to encode these scripts will not be attended to and effort will be restricted to substantially lower amounts that are produced by deliberative processes. Thus, deliberate and methodical performance of a new procedure is insufficient for thinkLet formation (Briggs et al. 2001). Accordingly, we propose:

P2: Skill development will be constrained by the emotional value placed on performance. *Both* a heightened state of arousal and a positive attribution toward a new task will be necessary to develop procedural knowledge, *ceteris paribus*. In other words, rationally reasoning through a problem is insufficient to encode the thinkLets necessary to learn a new task.

Ulrich and Lake (1990) also suggest that competencies may be generated through selection. The V-to-B Loop model would suggest that this may only occur if the following conditions hold:

- emotional balance of the organization does not materially change the valence or arousal conditions associated with goal pursuit for existing members of the organizations as a result of adding new personnel
- new personnel share values with corresponding appraisal of valence and levels of arousal as existing members of the organization
- procedural memory associated with added personnel is appropriate for the context and goals of the organization
- procedural memory associated with added personnel involves tools, language scripts (e.g., industry vernacular), and relationships with other expertise which exists in the local environment where the new personnel will work

These conditions suggest that selecting on the basis of competency and prior performance is insufficient to determine success. These conditions will become more important as the cognitive complexity (Shetzer 1993) of the job increases. Accordingly, Ulrich and Lake (1990) provide examples of complex work environments where realistic job previews are used to select new personnel. Similar HR practices that facilitate early socialization and value-clarification should result in improved knowledge transfer and higher performance in cognitively complex environments. Alternatively, environments low in cognitive complexity may engender excessive costs with little benefit from using such practices. Thus, we propose:

P3:   The performance improvement associated with selection of job candidates using realistic previews and other early socialization practices will be directly correlated with the degree of cognitive complexity associated with the job.

SCR: Measuring the action-performance link

Regardless of how capabilities are generated, reinforced and maintained for a sustainable resource-based advantage to be created measurable performance differences must result from use of these resources (Barney 1991). As David Guest (1999) noted in his review of HRM theory, creating unambiguous links between HRM and firm performance has been very difficult. To correct this deficiency he proposed that various strategies, practices, and outcomes are possible. Guest's article differentiates between the HRM and behavioral outcomes referenced in the practice-based literature and performance and financial outcomes by which most business executives may measure performance. However, it is not clear how these metrics may apply to a cognitive action-based model of HRM. Therefore, we will briefly discuss a method of measurement used by the first author in evaluating the plans and performance of early-stage entrepreneurial ventures called the Salary Coverage Ratio, or SCR, as a possible metric to assess the relative performance of HRM both within a firm and across comparable companies.

The Salary Coverage Ratio was developed to provide a method for translating periodic financial outcomes, such as those available in a profit and loss statement and balance sheet, into a simple measure that could be calculated on a daily, weekly or monthly basis to determine the relative performance of a process activity, work team or a structural entity such as a department or the overall organization. It also can be used to conduct benchmark analyses across organizations. The ratio is based on the revenue production directly supported by the measured organizational unit net of all third-party cash outlays (or "Net Revenue") divided by the cumulative compensation costs of all personnel involved in the measured unit. For an entire organization (used to evaluate the CEO), this would translate to the total Net Revenue of the company divided by the CEO total compensation. For most entrepreneurial organizations the ratio range for a CEO is between 25 and 75 times their compensation, so that a CEO receiving $100,000 in annual compensation should be able to manage a company producing between $2.5 and $5 million in Net Revenues per year. However, for most client service personnel this ratio is typically equal to 3 such that a consultant (without any expected third-party costs) should expect to bill approximately three times their income in order to provide sufficient cash flow to compensate the required support

staff and produce a reasonable profit. Simply dividing the compensation amount by the appropriate time increment, a ratio can be determined for any time period for which revenues are tracked (e.g., daily, weekly, or monthly sales). To calculate an SCR for a team, the compensation for the appropriate period would be aggregated and compared with the revenue production for the same period. People and teams at the same organizational level – determined by distance from revenue-producing activity – should have approximately the same SCR allowing easy comparison across groups. Finally, any increases in personnel costs will raise everyone's SCR involved in the same activity, so strong incentives exist to only add human resources who enable synergistic increases in performance, thus supporting a capability-based approach to SHRM.

This approach to calculating financial performance has two main advantages. First, it does not require waiting until accounting records are completed, allocations of costs determined and extraordinary items discussed and removed. Therefore, it can serve as a valid real-time assessment of current performance. Second, when used in conjunction with a business plan it provides a way for every employee to immediately understand the contribution they are expected to make to the organization in terms of revenues from customers and in support of those required to produce such revenues; and to provide a simple statistic that they can frequently track to determine how well (both efficiently and effectively) they and/or their team are performing.

Most notably for present purposes, the SCR of a process increases dramatically as cognitive scripts improve reflecting the increased productivity of mental effort. Human resource managers can use the SCR to identify target processes whose mental production is below average in relation to other organizational units or as a benchmark against comparable companies. Underperforming processes could then be deconstructed into a set of thinkLets (de Vreede/Kolfschoten/Briggs 2006) based on an incident analysis of prior team interactions (Davis et al. 2006). Best practices for each step in the process can be identified and information systems developed to augment the cognitive processes to better orient attention and effort (Pavel/Wang/Li 2003; Reeves/Schmorrow 2007).

In applying this to a cognitive action-based model of SHRM, each organizational process would have a pro forma and actual SCR calculated during each reporting period to determine the relative effectiveness and efficiency of the activity in producing company performance. SCR ratios would also be calculated for each team and individual to enable comparison both across personnel groups and across people within an activity. Finally, SCRs would be estimated for their industry group using salary survey data to enable comparison with industry norms thus controlling for variances in physical capital investments. The industry group calculations can then be used to determine relative performance and competitive differentiation in performance associated with specific resource configurations.

Implications for practice and future research

We now turn our attention to the implications of the model and assessment methodology for practice and future research. We will first discuss the methods for measuring human performance to assess the various components of the V-to-B Loop model. We

then discuss the practice implications associated with the role of HR in a cognitive action-based approach.

Methods for measuring human performance

The V-to-B Loop model of human performance provides a framework for integrating human resource roles and practices throughout the value chain of a company. Values, attitudes, goals, plans, scripts, and outcomes can become targets for HR strategy and suggest new methods of assessment of results. We have already discussed one such method, the SCR, for enabling comparison across individuals, groups, and organizations at outcome level that can facilitate the targeting of underperforming processes and opportunities for guiding skilled performance in a new direction. However, the model also suggests new methods are needed that incorporate the predominantly unconscious nature of human performance.

First, methods for assessing emotive responses to company vision, mission, and goals will be required. One such method, the Dictionary of Affect in Language (Petrone/Whissell 1988), can measure the level of emotion associated with a textual response. The DAL has been used to analyze responses to open-ended survey responses (Mossholder et al. 1995) and could also be used on personal journals or other written reactions to organizational statements, policies or programs.

Second, while some measures are being developed that can assess cognitive appraisals of valence associated with goals (Hijzen/Boekaerts/Vedder 2006) very little work has been done to understand the arousal levels associated with a goal. One method for acquiring this information is to use galvanic skin response (GSR) devices, but these can only be used effectively in laboratory settings. Another promising possibility is the use of signal processing techniques to detect the relative level of emotion displayed during recordings of speech when someone is describing their goals and implementation plans (Chul/Narayanan 2005). Finally, developments in the automated recognition of facial expressions may enable the development of tools for determining the state of arousal.

Finally, perhaps most important but also the most difficult will be the development of methods for assessing procedural memory and the development of thinkLets. Since these scripts are not available to conscious awareness, people generally cannot report this critical element of expert performance (Polanyi 1964). Currently, the only way to monitor procedural memory is using brain imaging techniques such as EEG and fMRI in highly controlled laboratory settings. As these technologies develop further perhaps field-based tools will become available.

Practice implications: A new role for HRM

The placement of human resources in the organizational structure may change as its role becomes more central to the production process of the organization through the management of cognitive scripts, emotions and resulting actions. Consequently, the role of human resources in relation to other departmental functions will also need to change. Education and evaluation of human resource professionals may need to adapt to the new challenges of this strategic position.

Training and assessment of HR managers will need to consider a broader role for HRM in organizational performance. The cognitive action-based view suggests that HRM should be responsible for facilitating the translation of the values, attitudes and goals of the organization into performance programs that create customer value. Therefore, HR managers will need to learn how to conduct business process analysis, design, and development. However, an HR manager cannot become an expert in every business process. HR staff may need to specialize in specific functional tasks such as sales presentations, accounting audits, or product design. Others may specialize in cross-functional processes such as strategic planning, goal setting, and quality control. Furthermore, the purview of human resources may need to extend beyond the walls of the organization. The greatest benefit from taking a cognitive action approach may be guiding the performance of suppliers, partners, and customers to increase the capacity for action across the entire value chain. This may involve collaborating with counterparts at affiliated organizations to facilitate the encoding of cognitive scripts involved in executing supply chain or customer delivery processes. Thus, the measurement of HRM success may need to include performance improvements outside the organization as well as inside.

A cognitive action-based HRM program will also fulfill calls for HRM to become partners with operations management in the pursuit of internal business goals (Ulrich 1997). As HR begins to evaluate both its performance and the employees' performance in terms of SCR or similar metrics, it will become a financial partner to operations staff because it will also be measured on bottom-line results. Accordingly, HR managers will either need to develop skills to become operations managers, or operations managers may become future HR executives who can apply a detailed knowledge of core activities to HR practices intended to increase capabilities by improving the translation from values into behavior.

Consequently, the future of HR education will also need to adjust to a cognitive action-centric view. Training will need to include survey courses in expert methodologies, such as strategic planning, product design, and quality control. Also, courses on methodology development will be necessary to enable HR professionals to assist knowledge workers in developing cognitive scripts that can be executed unconsciously following immersion in context-rich simulation training that can facilitate the development of tacit knowledge. Finally, HR professionals will need to learn a new set of tools as further developments in cognitive science create new ways of observing, measuring, and intervening in the development of expert performance.

Limitations of our model and the need for a new field of organizational studies

We have proposed a theoretical model of human performance that suggests that human resource management may become a positive force in creating sustainable competitive advantage (Cameron et al. 2003). Our model suggests this may occur in two different ways. First, performance management systems may be improved by identifying or developing the cognitive scripts and basic mental operations (i.e., thinkLets) necessary to effectively produce behavior. Secondly, human resource managers can begin to diagnose the emotional state of the organizations necessary to both build new capabilities (Fredrickson 2000) and to enable rapid and sustainable organizational change

(Tobey/Manning, in press). This model suggests that HRM is best targeted towards those organizational units which are underperforming in terms of productively producing customer value or in relation to industry benchmarks as measured by the SCR.

However, this model and the proposed SCR productivity measure are not without its limitations. The model assumes a positivistic approach to human resource management that is consistent with executive demands for prescriptive solutions. Future research will need to critically examine whether skilled performance may be guided in ways that disadvantage some groups over others, or which might motivate undesirable actions in the quest to achieve challenging goals (Schweitzer/Ordonez/Douma 2004).[1] Also, little is known about how neural processes affect organizational outcomes as most cognitive neuroscience studies are performed on individuals acting alone (for a review of exceptions, see Cacioppo/Berntson 2004). This suggests the need for a new branch of management inquiry that might be called "organizational neuroscience." Organizational research and management education have, for the most part ignored developments in these areas (for an exception, see Senior/Butler 2007) and consequently our approach to HRM may be exceedingly difficult for organizations to implement for lack of requisite knowledge and skills. Finally, the example methods described only address two of many ways in which cognitive action may be assessed, diagnosed, and linked with performance (Paauwe 2004).[2] Since much of cognition occurs outside conscious awareness (Bargh 1997; Soon et al. 2008) it will be important for future research to identify how the techniques for guiding skilled performance may be made transparent to those whom it effects so that performance improvements may be effectively linked with their causes, and those manipulated by these techniques may be made aware of how their behavior has been altered.

Conclusion

We have attempted in this paper to provide a brief sketch of the possibilities and challenges for developing a strategic approach to human resources management based on a new perspective brought about by the recent advances in cognitive neuroscience. By utilizing these new methods, human resource managers may again become a strategic asset to the organization because of their specialized knowledge of industrial psychology. We have proposed that these developments enable a new approach – the cognitive action-based view of HR – that moves beyond a traditional practices-based approach. In so doing, we hope that have encouraged others to explore the potential of cognitive neuroscience to inform the link between human resource practices and organizational performance, and to enable practitioners to find new ways of aligning performance throughout an organization and across the network of organizations that create resource-based competitive advantage throughout a value chain.

This special issue focuses on the end of personnel. Changes in employment patterns and the locus of responsibility for human resource development create the risk that the human resource function will become irrelevant (Keenoy 1990). However, we believe these claims are made based on an obsolete model of HRM that is practice-

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[1]   We wish to thank an anonymous reviewer for bringing this point to our attention.

[2]   We again thank an anonymous reviewer for bringing this point to our attention.

based. Instead, we proposed a new approach based on advances in cognitive neuroscience that suggests personnel managers offer an important and unique competency in applying recent developments in psychology to organizations. Rather than signaling the "end of personnel," we believe new theories of human performance, such as the one proposed here, may increase the strategic value of HRM by directly linking the management of behavior to performance while enabling new measurement metrics that facilitate the development of mental capacity throughout a value chain. Thus, HRM can meet executive demands for improved performance by changing the focus from managing practices to managing minds.

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