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THE GOVERNANCE OF TELECOMMUTERS: AN AGENCY AND TRANSACTION COST ANALYSIS

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ABSTRACT

Telecommuting is a topic of interest for practitioners and scholars alike. However, research on telecommuting is only beginning to scratch the surface (Siha & Monroe, 2006). To better understand the phenomenon, there is a need to understand organizational, managerial, and worker motivations and practices. One challenge for management is to develop control strategies that accurately monitor and evaluate remote employee work. To this end, this paper develops a framework for the managerial control of telecommuting employees based on an integration of transaction cost and agency theories. Specifically, this paper contributes to managerial theory by investigating the effect of transaction uncertainty, outcome uncertainty, and work utility on the utilization of two forms of organizational governance, behavioral and output controls. Propositions are developed and ramifications for further research and practice are discussed.

INTRODUCTION

This paper seeks to stimulate research about the managerial challenges of a constantly evolving bureaucratic workforce. Specifically, this work seeks to add to organizational theory by integrating transaction cost theory and agency theory with forecasted trends in the governance of telecommuting employees. Telecommuters, or "teleworkers", are employees that are allowed to perform organizational work from a residence, or other location, instead of reporting to a centralized office location (Siha & Monroe, 2006). While the two managerial theories have been applied in a large number of organizational settings and circumstances, there have been no prior attempts to integrate these theories to forecast the effects of uncertainty on the control of a telecommuting workforce. This paper proposes a managerial framework that incorporates transaction uncertainty (from transaction cost theory) and outcome uncertainty (from agency theory) as determinants of employee control. First, the two theories are described and then adapted to present the hierarchical governance of a telecommuting workforce. After which, propositions are developed about which managerial control mechanisms are to be used under varying degrees of transaction and outcome uncertainty, considering the gravity of the work to be produced and the level of trust in the employee.

LITERATURE REVIEW

Transaction-Cost Theory

Transaction costs are the costs of negotiating, monitoring, and governing exchanges between people (Williamson, 1975). In transaction cost theory, a main purpose of the organization is to reduce the overall costs of exchanging goods and services in the environment and the costs of supervising exchanges within the organization. In-house transaction costs are generally labeled as "bureaucratic" or "hierarchical" costs and are the costs that are germane to this analysis. Internal business exchange structures of interest here are those that concern the governance aspect of distance employees, commonly referred to as "telecommuters".

Determinants of Transaction Costs

The major determinants of transaction costs are identified as transaction uncertainty (Jones, 1987) and performance ambiguity (Ouchi, 1980; Jones, 1987).

Transaction uncertainty is associated with the extent that the employer-employee alliance is not consistent. This is primarily due to a lack of familiarity of the employer with the employee. The lesser the degree of familiarity with the employee, the more confirmation concerning the employee's work methods, attitude, and capability is necessary for the employer. Transaction uncertainty may decline over time, with augmented communication and interactivity, allowing the operational relationship of both parties to become less unpredictable (Jones, 1987).

Performance ambiguity is linked to the accepted hazard that an employee takes on when work is carried out for an organization (Ouchi, 1980). Specifically, the implicit exposure involves the costs that must be endured by the employee when work is delivered that does not have acceptable utility for the employer. The consequences suffered for sub-par work are typically a deficiency in the agreed upon remuneration for such work and/or the economic opportunity cost related with having to rectify the mistakes or recreate the deliverable(s) entirely. Accordingly, performance ambiguity refers to the employee's capacity to appraise work accurateness and to appropriately assess it's usefulness for the employer (Ouchi, 1980). It is a function of task specificity, employer assistance, and the employee's competence in the performance of said task. The higher the levels of task specificity, employer assistance, and employee competence, the lower the level of performance ambiguity (Ouchi, 1980; Jones, 1987).

Agency Theory

The goal of agency theory is effective control of employees using some form of monitoring (Eisenhardt, 1988). Agency theory approaches the problem of employee control as a matter of risk sharing. It implies that observability (employee monitoring) and outcome uncertainty (the probability of incorrect work) are the determinants of control; and, that there is an element of risk with regard to income streams in any control system (Eisenhardt, 1988, 1989; Kren & Kerr, 1993). The more an employee can be observed, the less risk (performance ambiguity) the employee has to assume. Because of monitoring, the employer is more knowledgeable about the work performed and, thus, uncertainty is decreased.

Outcome uncertainty is also decreased by the nature of the work involved (Eisenhardt, 1989). Standardized, routine outputs are negatively related to outcome uncertainty because the employer and employee know exactly what is to be produced and received. The more secure the employer is about the usefulness of the employee's work, the more certain is the employee's compensation. However, in instances where observability and/or product standardization is low, outcome uncertainty is high and the employee suffers the risk for producing the wrong outcomes. Thus, compensation is dependent on the organization's perceived utility of the outcomes produced. The consequences that the employer suffers when an employee produces low-utility output are a function of the import of the project assigned. If incorrect employee output causes a loss of future income for the employer, the economic ramifications (costs) are high.

Transaction Cost and Agency theories are complements of each other because performance ambiguity and outcome uncertainty are near equivalents. In prior research, performance ambiguity was conceptualized as the costs that client organizations incur to monitor and evaluate the performance of other parties in an exchange (Jones, 1987). Telecommuters may be conceptualized much like independent organizations or other separate entities. Traditionally, telecommuters maintain their own working schedules and have little physical interaction with the traditional organizational center (Bailey & Kurland, 2002). In this paper, performance ambiguity is related to outcome uncertainty as the economic opportunity cost (risk) incurred by employees under conditions of low observability and/or non-routine product expectations within the organization. Non-routine output increases the risk of incorrect employee performance and increases the likelihood of lost economic opportunities by the employer.

Outcome uncertainty is related, therefore, to the real or economic costs (risk) suffered by employers associated with telecommuting employees and the non-standard (or routine) character of their work.

The Transactional Nature of Internal Organization

A transaction is a bilateral exchange between two or more parties. In an employment transaction, the conditions for execution are determined and work is carried out according to procedures developed and/or agreed upon (Commons 1950). Williamson (1975) writes that all societal, financial, and political transactions bring about transaction costs. In transaction cost theory, organizations transform, in both capacity and internal alignment, in order to diminish transaction cost difficulties over time (Yarbrough & Yarbrough, 1987).

The origins of transaction costs may be viewed as transmission problems that are introduced into the exchange process of a market transaction (Williamson 1975). Transaction costs are the negotiating, monitoring, and enforcement costs that must be endured to facilitate a transmission between several parties (Klein, Crawford, & Alchain, 1978). The six main causes of transaction complications (Jones & Hill, 1988) are:

1. Bounded Rationality – Rational human behavior is determined within the bounded limits of each individual's knowledge and the cognitive facility to process information.
2. Opportunism - People tend to act according to what is aligned with their own self-interests. Opportunism occurs when one, or both, of the parties to a transaction seek to alter the provisions of an agreement after the fact.

3. Uncertainty / Complexity – There is extensive uncertainty and complexity in the business environment.
4. Small Numbers Trading Relationships – Reliance on a single supplier for any resource will likely result in opportunistic behavior on the part of the supplier. However, these types of trading relationships are commonly found.
5. Asset Specificity – Significant sunk costs in resources (assets) that have limited use outside of an individual business transaction.
6. Information Impactedness - In a typical business exchange, it is common for one party to the transaction to have more knowledge than the other(s).

Each one, or any combination of these sources, may bring about transaction complications and increase costs. All of these factors make business dealings risky and inefficient. For example, behavioral uncertainty on the part of an employee may increase the cost of enforcing contracts due to the possible lack of productivity brought about by agent opportunism. In order to prevent this situation, the employer must incur the increased cost of authoring comprehensive agreements that will restrain employee behavior under a diversity of situational contingencies (Arrow, 1974). Given that the employer is limited by the bounded rationality of their own cognitive experience and cannot plan for every contingency, increased transaction costs due to opportunism may still be apparent because of information impactedness in favor of the employee. In other words, the employee may find weaknesses in the contract and exploit these to their benefit. In addition, the threat of increased costs due to opportunism may be heightened if there is asset specificity or small numbers bargaining conditions, which further restrains the employer from seeking other agency alternatives due to the high switching costs involved (Pisano, 1990).

There is an economic benefit to the organization when the use of hierarchy is selected over the use of the market as a basis for employer/employee transactions (Jones & Hill, 1988). The use of hierarchy is highlighted by internalization of the workforce, which remains the primary work arrangement in business. Internalization is more efficient than the market because the more exacting the approach implemented, the more influence each party has over the other's actions. If an organization depended solely on the market to carry out its chief objective, each work deliverable produced would be the consequence of a convoluted bartering and monitoring routine that would have to be repeated every working day. By internalizing the workforce, the bartering expense is kept to a single employment search and offer situation; and, monitoring is made unproblematic by including it as an element of the employment agreement. Therefore, the costs of negotiation, monitoring, and exchange are decreased.

The most important advantage that an organizational employment agreement has over mutually exclusive market negotiations is that the employee consents to be compensated with fixed wages in exchange for suborning to the right of superiors to direct and monitor the employees work efforts, thereby, minimizing the likelihood for incidences of self-interest agent opportunism. Furthermore, hierarchy creates an atmosphere of trust much more apparently than a market can between negotiating parties with their inherent self-interest biases (Ouchi, 1980).

Agency theory makes it clear that transaction costs are, likely, still apparent even when organizations opt for bureaucracy instead of the market. The likelihood of agent opportunism continues to be a threat on any occasion that authority is entrusted to an agent (Shapiro, 2005). The employment of bureaucratic mechanisms in organizations routinely results in some control insufficiency of the work systems (Jones &

Hill, 1988). The distribution of authority to subordinates may encourage them to create agendas that further their own self-interests in preference to organizational goals and objectives (Leibowitz & Tollison, 1980). This "moral hazard" inefficiency is characteristic of contractual business exchanges (Alchain & Woodward, 1987). The moral hazard in telecommuting refers to opportunistic shirking, stealing, and other problems that arise when employee actions cannot be viewed by appropriate supervisory personnel. The challenge, therefore, becomes to develop a control structure that provides the organization with the information necessary to discern, and eliminate, opportunistic activity.

Types of Control

Managerial control within organizations may be defined as the practice of developing standards, observing and assessing performance, judging outcomes, acknowledging accomplishments, and taking necessary action to cure deficiencies in the work performed (Hill & Jones, 1993). Most organizational functions are driven off course because individuals who are in charge choose not to behave in accordance with organizational goals and policies (Hofstde, 1978). Agency theory concedes that employees may maximize personal gain by choosing to freeload, embezzle, or otherwise avoiding executing occupational responsibilities (Shapiro, 2005). An indispensable phase in the planning of effective control systems, then, is to make certain that employee decisions correspond with organizational objectives. Agency theory distinguishes two such control methods, behavior control and output control (Eisenhardt, 1989).

Behavior control means that the employee is compensated with earnings at a fixed rate for displaying appropriate work behaviors and that employee work habits during performance can be scrutinized, generally in person, to insure congruence with organizational standards and policies (Eisenhardt, 1988). When output control is used, a worker's pay is dependent on the level of productivity which can be ascertained without the need for observation of the work being performed (Eisenhardt, 1989). With output control, reliance on the use of commissions or piece-rate compensation for performance is customary. Another type of control, clan control, involves self-regulating groups of workers who naturally express behaviors that are congruent with the socialized acceptance of shared organizational customs and values (Ouchi, 1979). Clan control is applied when behavior and output controls cannot be established. Behavior and output controls are of interest here.

In situations involving unfettered behavior control, the worker has no mandate to deliver specific goods or services. The agreement is that he or she will simply employ the required work methodology without deviation (Eisenhardt, 1988). Compensation and incentives are dependent on the demonstration of mandated behaviors through personal observation or written reports. Therefore, risk is diminished for the employee in relation to his or her income by strict adherence to the mandated behavioral methodology. Alternatively, under complete output control workers have a responsibility to deliver goods and services that meet clearly defined standards of acceptance. In cases of failure, the worker suffers by sacrificing rewards (income). Output control indicates that the worker accepts any and all of the effects for any inadequacy connected to the results produced and, therefore, accepts all of the risk involved (Baiman, 1982; Holstrom, 1979) for mistakes. However, the employer also suffers damage when the output from the worker is valuable and necessary to obtain organizational revenues. Consequently, risk exposure and actual damages are experienced by both sides involved in the transaction.

The most advantageous selection between the two options depends on a compromise concerning the cost of evaluating behaviors and the cost of assessing outputs while passing on the risk of the transaction to the employee. Under conditions of diminished surveillance, management can elect to buy information about the employee's behavior; thereby, utilizing a behavioral control approach by developing a structured notification apparatus that can closely monitor the employee's behavior. This notification apparatus might exist in several forms including the usage of incentive-based whistleblowing schemes, additional layers of management, supplementary reporting requirements, and improved fiscal control procedures. Basically, the development of a more restrictive working environment. These mechanisms may be costly, but the employees do not suffer the possibility that mandated behaviors may not yield expected rewards due to causes not within their control.

On the other hand, the organization can choose to employ output control. Agency theory contends that output controls during periods of environmental uncertainty are risky for employees because outcomes are primarily a consequence of their actions and of the prevailing state of affairs (Baiman, 1982). Therefore, a worker may be penalized for inadequate outcomes that are the result of, at least partially, circumstances outside of their control. Due to the perilous nature of this position, organizations may find that they must compensate workers at the highest levels since a significant portion of the risk in the employment arrangement has shifted to the employee. Consequently, it has been previously demonstrated that it is more cost-effective for firms to mitigate this risk by compensating workers by means of fixed salaries than it is to pay high commissions or piece-work rates that recompense for employee acceptance of the risk described (Basu, Lal, Srinivasan, & Staelin, 1985).

To sum up, it is deemed better to implement behavioral controls through a structured notification mechanism when specifics about worker behavior is deficient and when the transaction cost of assembling these details is less expensive than discerning the actual utility of outputs produced.

Trends in Telecommuting

The concept of telecommuting is but one example of what organizations are doing to fight the high costs associated with doing business. By definition, telecommuting is the practice of performing work outside of the traditional workplace while sustaining communication via computer-based means (Wright, 1993). Specifically, work is carried out in locations that are isolated from central offices or production facilities and where employees have no personal contact with co-workers. Typically, there are three types of work locations where telecommuters perform their duties: 1) Satellite work centers, 2) Neighborhood work centers, and 3) Home-based work centers (Olson, 1982). Satellite work centers house groups of employees from a single business and are located a distance from the employee's homes and conventional workplace. Satellite office space is usually selected in an area that is convenient to the employees and/or prospective customers. Neighborhood work centers are identical to satellite work centers with the exception that they are designed to house employees from several businesses at the same time. The most common form of telecommuting occurs within home-based work centers. A home-based work center exists whenever an employee routinely works from their own home. It is estimated that over 20 million workers in the United States telecommute, with the largest portion of this workforce choosing to work from their own homes (Kirk & Belovics, 2006).

Telecommuting is a growing phenomenon that is forecasted to become more of an operational norm in years to come. In the 1990's, an estimated 42% of companies in the United States used telecommuting to cut employee commutes, free office space, offer family friendly flexibility, and to save the company money (Girard, 1997). A more recent study found that the practice of telecommuting is still growing in that 19% of all federal government employees were engaged in some form of routine telecommuting to do their jobs (Arnold, 2006).

How effective are these home-office employees? The National Academy of Science conducted a test in 1985 that showed telecommuting raised productivity by 15% to 25% (Cote-O'Hara, 1993). Other studies have been known to show normative productivity gains from 10% to 40% (Nie, 1999). These productivity gains are largely the result of the conversion of automobile commuting time that is transferred to work time. Other reasons are that telecommuting employees eliminate typical office distractions during the workday (such as personal conversations) and they usually work longer hours than other types of employees (Mello, 2007). Telecommuters generally have more energy than other employees because they can choose to work during the times of day (or night) when their energy levels are highest (Cote-O'Hara, 1993). Also, absenteeism predictably declines because employees can choose to work part-time on those days that they normally would have missed due to illness (Cote-O'Hara, 1993).

The promise of telecommuting offers societal benefits that may ultimately have far greater consequences than increased business productivity. As the population of telecommuters grows, this should result in an inverse decrease in the overall number of traditional automobile commuters. A decrease in the number of conventional commuters should also result in less pollution, less traffic, fewer accidents, and decreased travel-related costs for the worker. A more comprehensive interpretation of telecommuting benefits may envision increased independence from fossil fuels, fewer health-related costs, a healthier (greener) environment, and a redistribution of government investment from infrastructure development and maintenance to helping solve the more critical societal ills (poverty, hunger, education, etc). In essence, the societal benefits of telecommuting may contain partial answers to reinvigorating the economic and competitive strength of the populous.

This premise of this paper is one that visualizes the future workplace as one where employers and employees rarely interact physically. While telecommuting does decrease some bureaucratic costs, such as extensive fixed asset investment in real estate, the question of what type of managerial control should be employed, and under what circumstances, with these satellite employees is an issue that must be resolved.

The Governance Structure of Telecommuting Organizations

Transaction cost theory tells us that the costs of economic activities are not technologically determined but are dependent on the form of organization under which the activities are conducted (Yarbrough & Yarbrough, 1988). Therefore, if an organization wants to structure itself so that it can implement a behavioral control information system, it should and it will. In this case, management may surmise that the increased expense of tight behavioral monitoring is worth it to ensure that the required work methodology is being executed without deviation. Likewise, if management wants to concede observability as a lost cause, an output control system will likely be maintained. It is rational to assume, however, that, in these cases, the nature of products or services produced under an output control environment will be such that delayed acceptance until reasonable quality can be achieved will not place the firm in a position of undue

stress. Therefore, it is of no consequence that telecommuters may utilize higher levels of technology to remain in the privacy of their own homes, or work in satellite locations away from the corporate center, because transaction cost theory claims that the resource requirement to implement this strategy is only a secondary consideration. More importantly, organizations will employ a telecommuting strategy because the internal structure of the firm will naturally evolve to select a strategy and governance structure that minimizes total bureaucratic costs (Coase, 1937). So, the question naturally becomes, how can managers implement a behavioral control system with a workforce that is located in physically remote locations; and, when is the total economic cost of obtaining behavioral information in the circumstance of telecommuting less costly than exposing the firm to the inherent risks involved in the utilization of output monitoring?

Behavioral Controls and Telecommuting

There are six primary methods that managers commonly utilize to control the behavior of telecommuters (Fairweather, 1999; Festead, Jewson, & Walters, 2003). They are summarized as followed:

1. Use of Technological Monitoring Devices - Computer Based Performance Monitoring (CBPM) systems are software programs that collect and transmit a wide variety of data about the productivity and work patterns of employees from their computer (Fairweather, 1999). CBPM allows managers to easily, and constantly, access and monitor data collected on all of the employees networked into the system. Typical uses include monitoring the number of data entry keystrokes per hour for each employee, the length of telephone calls and time between calls, the time an individual spends away from his or her desk, the time to process claims, and to record total work hours logged per day, among other things.
2. Monitoring of Telephone Communications - The recording and/or monitoring of telephone communications has been an accepted practice for many years in a wide variety of industries. Reasons that telephone conversations may be monitored include quality control, curtailment of personal use, and organizational privacy concerns (Fairweather, 1999) .
3. Electronic Mail Monitoring/Archiving - Firms routinely monitor and archive electronic mail transmissions to deter employee abuse of organizational time and resources by conversing with friends and relatives. For business related use, other reasons may include monitoring for illegal or fraudulent purposes, divulging trade secrets, and inappropriate relations with organizational stakeholders (Fairweather, 1999).
4. Use of Video and Audio Recording Devices - A typical use of video and audio recording devices in telecommuting is to help combat feelings of isolation formed in telecommuting employees by allowing them to correspond with the main office by means of teleconferencing (Fairweather, 1999). The two-way visual and audio interaction of teleconferencing, if performed on a routine basis, allows the telecommuter to retain visibility, develop personal relationships with their peers, and preserve the perception that they are a part of the team. Alternatively, cameras and microphones may also be installed around the entire work area of the employee and used as a means for comprehensive behavioral surveillance. In this fashion, managers may monitor and record every movement and utterance of employees while they go about the performance of their organizational responsibilities. In essence, these devices may allow the manager the highest level of intimate knowledge about the

working behavior of employees because the monitoring may be done at any, or all, times work is supposed to be performed and without detection.

5. Home / Satellite Office Visits - Managers use announced, and unexpected, visits to telecommuter work locations for a variety of legitimate business reasons which includes health and safety assessments, performance appraisals, coaching, training, sickness monitoring, feedback, etc. However, personal visits also give managers the opportunity to inspect the demeanor, attitude, and condition of the worker. Many workers (and their families) find unannounced personal visits to be somewhat intrusive but some managers find it imperative to observe employees up close (Festead, Jewson, & Walters, 2003).
6. Trust - Trust exists when telecommuting workers are recognized by management for possessing the capabilities of individual self-discipline, self-motivation, and self-management. It entails a relationship, between selected workers and management, of shared ethical and business commitment in which rewards, productivity, and respect are exchanged without investigation. In practice, trust functions as a form of control and not an alternative to it. When organizations emphasize trust as a component for eligibility to be allowed to telecommute, the employees will be selected because, based on historical performance with different levels of responsibility, management has discerned that there is no need for high levels of observational scrutiny. Generally, higher grade workers who have clear records of proven reliability identify the archetype of a telecommuter selected on the basis of trust (Festead, Jewson, & Walters, 2003).

Each of the aforementioned behavioral monitoring strategies increases the short-term organizational costs of business transactions in terms of resource acquisition (purchase and installation of monitoring devices), labor expense (personnel cost to monitor telecommuters), travel expense (related to site visits), and opportunity costs (when trust is unfounded and the business is exposed to the cost of risk). However, under transaction cost rationale, these costs are justified because they serve to lessen transaction complications and, thereby, decrease the long-term costs of regular exchanges (Hill & Jones, 1993). For example, portable teleconferencing systems (e.g., laptop enabled with web-cam, microphone, and a portable bluetooth-enabled phone) can be taken to meetings, seminars, and other corporate functions and allow managers to listen in and interact with the telecommuting employee in the field so that they can know exactly what occurred and correct any mistakes in real time (decreases uncertainty and information impactedness). Organizations may also choose to conduct comprehensive surveillance with installed video and audio devices in employee work areas in order to make continuous appraisals of employee performance (decreases uncertainty and opportunism). Additionally, there is time-tracking software that can let managers know how much time an employee has put into certain projects (CBPM) and electronic bracelets that can pinpoint the exact location of an employee out of the office (decreases uncertainty and opportunism). When compared to the cost of maintaining office buildings (decreases asset specificity) and hiring managers to supervise employees on location (decreases opportunism), these behavioral monitoring devices are cost-efficient and readily available.

How do managers feel about telecommuting? Many managers oppose the arrangement, dreading the supposed loss of control over, and access to, employees and perceived reduction in their own value to the company (bounded-rationality). In most organizations, telecommuting requires a fairly major change in culture (Cote-O'Hara, 1993).

Output Controls and Telecommuting

Organizations employ output controls to monitor their telecommuting employees mainly because, considering the costs of behavioral monitoring strategies, they are deemed as unobservable (Kurland & Cooper, 2002). In other words, the assumption is that the cost of behavioral monitoring is prohibitive to these firms so observation of the telecommuter is not a viable option for them. For these businesses, the organizational culture has evolved from managing by activity (direct observation of the work in progress) to managing solely by production results. Agency theory argues, however, that output monitoring is more costly than effecting behavioral controls (Basu, Lal, Srinivasan, & Staelin, 1985) since workers must be compensated to take on the risk of possibly producing low utility output. Therefore, the employer must regularly pay a premium for the employee's services. When the employee delivers unacceptable output results on a project that the employer needs to secure income, the employer bears the penalty of missed economic gain. This is the cost (risk) of outcome uncertainty that is of interest here. However, in cases of standardized and routine output risk is negligible because output usefulness is guaranteed. Transaction costs decrease as employee and employer risks decrease. Thus, under the transaction cost theory, output control may not be advantageous under all situations.

Characteristics of Bureaucratic Transactions

In order for the employer-employee bureaucratic agreement to take place, both parties must benefit from it. Reducing the bureaucratic costs increases the mutual rewards each party may gain from the transaction. Therefore, the purpose of investigating the employer-employee interaction from agency and transaction cost standpoints is to discern those dimensions of the exchange that may lead to risk and increased costs. Two transaction characteristics, transaction uncertainty, from the transaction cost perspective (Ouchi, 1980), and outcome uncertainty, from agency theory (Holstrom, 1979), account for the amount of negotiating, monitoring, enforcement and risk-related costs built-in between employers and, in this case, telecommuting employees. Both of these characteristics have an effect on the scale of information that must be managed to conclude such transactions. For this paper, transaction uncertainty represents those elements leading to costs for the organization to monitor the behavior of telecommuters, while, outcome uncertainty represents those costs for the organization related to the nature of employee work (standard or non-routine) and the inherent risks related to producing this work.

An Organizational Control Framework for the Management of Telecommuters

The determinants for organizational control of telecommuting employees are described by varying levels of transaction and outcome uncertainty while considering the utility of the work performed for the employer.

Transaction Uncertainty and Telecommuters

Transaction uncertainty may be interpreted as the degree of familiarity that the employer has with an employee's work habits, reliability, and performance (Jones, 1987) and exists to the degree that

telecommuting employees are not physically observable. However, the organization must have some evidence that employees are performing those duties which they were hired to perform. If not, workers will remain free from scrutiny and agent opportunism tendencies may surface. To alleviate this risk, the organization should take steps to avoid it

Principally, the organization must make an effort to dissuade telecommuting employees from, among other things, farming out sensitive work, shirking during the workday, and misrepresenting the company to clientele. As the tendency for unsupervised agents is to behave opportunistically (stealing, cheating, selling sensitive information, etc.), organizations must guard themselves against possible security breaches (Shapiro, 2005). Therefore, behavioral monitoring is indicated. This rationale implies, however, that the work output from telecommuters has a fairly high utility value for the employer. In cases where the utility value is not significant, output controls may be established because the risk assumed by the employee is minimal. As risk for the employee decreases, organizational costs for those risks assumed decreases making output control less expensive than behavioral monitoring.

In addition, the level of transaction uncertainty is a function of infrequency. The more repeated the exchange between an employee and an organization, the lower the uncertainty and cost of transactions (Jones, 1987). Initial transaction uncertainty will decrease with extensive behavioral monitoring. Over a period of time, however, extensive monitoring will not be necessary. This is because when exchange is frequent, the parties to transactions become used to dealing with each other and rely more on past experience (Williamson, 1975).

In summary, transaction uncertainty will decrease with behavioral monitoring and is cost efficient under conditions of high work utility and/or high employee assumed risk. The level of behavioral monitoring, however, will decrease with an increase in transaction frequency over time, due to a familiarity of the transacting parties.

Outcome Uncertainty and Telecommuters

Outcome uncertainty refers to the nature of the work performed (standard or non-routine) which affects the amount of risk assumed, by the telecommuting employee, for producing low-utility output (Eisenhardt, 1989). Increased employee risks are positively related to increased bureaucratic costs (Jones, 1987). Outcome uncertainty is heightened by non-standard outputs because they are unique and dissimilar. Examples of non-standard outputs are business plans, consulting services, medical advice, and contract proposals. There is variation in the accomplishment of the work, as well as its usefulness to the employer. If the telecommuter, acting as an agent for the employer, incompetently negotiates a project price for work that will result in a loss for the employer, then it is the employer who will lose profits on the deal because of being legally bound to deliver as per the contract agreement. Behavioral monitoring will reduce this risk of potential lost income. Alternatively, if the type of output expected is of low utility and standardized, one should use pure output monitoring (without paying a premium) because the risks are low for the employer and employee. Therefore, output monitoring may be a less expensive option.

A related workforce drawback forwarded by managers is the impact of telecommuting on both formal and informal communications (Gibson, Blackwell, Dominicis, & Demerath, 2002). The significance of such dialogue to the successful conclusion of assignments is critical. The lack of recurrent advice and criticism (formal and informal) from supervisors and colleagues can cause confusion, needless errors, and duplication

of work (Ford, 1991). This lack of communication increases outcome uncertainty because high utility outputs cannot be guaranteed without strict direction. Behavioral monitoring may decrease this uncertainty by increasing communication.

In summary, outcome uncertainty is increased for work that is non-standard in nature due to the risks that the employer might suffer for high utility work not being produced adequately.

PROPOSITION CONSTRUCTION

Based on the review of literature previously, a framework of governance possibilities for daily telecommuters may be constructed by integrating the employer-employee relationship variables transaction uncertainty, outcome uncertainty, and work utility (See Figure 1). In review, transaction uncertainty is defined as the level and degree of familiarity that employers have in their employees (Williamson, 1975; Jones, 1987). Outcome uncertainty concerns the risk that employees and employers suffer in case the outputs delivered are unacceptable. This risk is tied into the nature of the work performed—there is more outcome uncertainty for non-routine (or customized) outputs than for simple, routine, or standardized outputs (Eisenhardt, 1989). Finally, work utility is a function of the importance of the outputs produced to the organization (Eisenhardt, 1989). It may be surmised that it is rational for organizations to ensure the quality of high utility outputs by taking precautions. In essence, more control may be necessary when the firm depends on the delivery of high utility outputs.

Figure 1: Framework for Organizational Control of Telecommuting Employees

	Work Utility			
	Low	High	Low	High
Outcome Uncertainty (Low)	Output Cell 1	Output or Behavioral Cell3	Output Cell 5	Behavioral Cell 7
Outcome Uncertainty (High)	Behavioral Cell 2	Behavioral Cell 4	Output or Behavioral Cell 6	Behavioral Cell 8
	Transaction Uncertainty (Low)		Transaction Uncertainty (High)	

In CELL ONE, transaction uncertainty, outcome uncertainty, and work utility all assume low levels. Therefore, there is familiarity with the employee and his or her general work habits, the nature of the output expected is routine, and the importance of the product or service is low. Under these conditions, the firm should not invest in technology to monitor the telecommuter because, since there are no risks assumed by the employer or employee, costs will remain low. The firm should, therefore, institute an output control system and compensate the employee at standard rates for the work performed.

In CELL TWO, transaction uncertainty and work utility remain at low levels but outcome uncertainty is high. Specifically, the employer is familiar with the employee's general work habits but the outputs required are non-routine (specialized). Under these circumstances, the firm should implement behavioral

control utilizing technology as an alternative to implementing output control and compensating the employee for the risks assumed due to the probability of producing unacceptable work. In other words, it will be less expensive over the long-term for the employer to interact with the employee and provide direction than it will be to continually pay a premium for work under an output control setting.

In CELL THREE, transaction and outcome uncertainty is low but work utility is high. The employer is familiar with the telecommuting employee and his or her work habits; and, the nature of the work produced is routine. However, work utility is high meaning that the work is important for future company income. Therefore, the choice between control mechanisms rests on the trust that the employer has in the employee. The firm should institute behavioral monitoring using technology if there is any question about employee competence, honesty, or timeliness. However, if agent opportunism is not an issue (based on the historical reliability of the worker) an output control mechanism (no premium) will be less expensive.

In CELL FOUR, transaction uncertainty is low but outcome uncertainty and work utility is high. In other words, the worker's habits are well known but the product or service is valuable to the firm and it is of a customized nature. This condition will require the use of behavioral monitoring so that the firm can be assured that the work is being performed correctly and that it will be done on time.

In CELL FIVE, transaction uncertainty is high, outcome uncertainty is low, and work utility is low. This cell describes a situation where the employer is not familiar with the employee's work habits or abilities; but, the output expected is routine and of little importance. This condition requires the implementation of an output control strategy because, since the output is routine, there are no assumed risks for which the employer has to pay a premium. In the case of employee failure, it is more cost effective, under these circumstances, to cancel the employer-employee agreement and to hire someone else rather than invest in technology that would allow the employer to interact with the telecommuter.

In CELL SIX, the employer is unfamiliar with the employee's work habits and abilities, the work performed is of little importance, and the work is non-standard. Since it has been demonstrated that behavioral monitoring may be less expensive than paying output control premiums for employee assumed risk (Basu, Lal, Srinivasan, & Staelin, 1985), behavioral monitoring using technology is indicated. However, if the cost of behavioral monitoring is more than the cumulated cost of paying higher premiums, output controls will be established.

In CELLS SEVEN AND EIGHT, behavioral monitoring will be implemented because of the importance of the work and the unfamiliarity of the employer with the employee. Outcome uncertainty is not relevant, in these cases, because there is no reason to trust an unfamiliar remote employee to work on vitally important projects without some direction from management, regardless of the nature of the work (standard or non-routine). In this state of affairs, the risk of forgone income to the employer is best mediated by behavioral monitoring.

Propositions

From the framework above, the following propositions are theorized:

Proposition 1: Low transaction and outcome uncertainty is positively related to output control of telecommuting employees for low utility work.

Proposition 2: Low transaction uncertainty and high outcome uncertainty is positively related to behavioral control of telecommuting employees regardless of the utility of the work.

Proposition 3: Low transaction and outcome uncertainty is positively related to behavioral control of telecommuting employees in cases of high work utility and a lack of trust for the employees.

Proposition 4: Low transaction and outcome uncertainty is positively related to output control of telecommuting employees in cases of high work utility and high trust for the employees.

Proposition 5: High transaction uncertainty and low outcome uncertainty is positively related to output control of telecommuting employees in cases of low work utility.

Proposition 6: High transaction and outcome uncertainty is positively related to behavioral control of telecommuting employees in cases of low work utility if the cost of monitoring technology is less than the cumulated payment of output control premiums.

Proposition 7: High transaction uncertainty and high work utility is positively related to behavioral control of telecommuting employees regardless of outcome uncertainty.

DISCUSSION & CONCLUSION

This paper contributes to organizational theory and management practice by integrating transaction cost and agency theories to attempt to forecast the impact of telecommuting on the governance practices and structure of organizations. The impending role of the satellite workforce is one that is changing as technology further evolves. Behavioral control has been identified as the most efficient method to insure the quality of outputs and monitor employees. It is currently possible to maintain control of telecommuters by using readily available technological devices. However, the cost of these behavioral controls can be prohibitive, depending on several work characteristics, and in those instances output controls may be most appropriate.

While the list of new technology that makes it possible to observe the behavior of employees and interact with them is expanding, the fear that these devices will be used to abuse the workforce is rising also (Fairweather, 1999). There is a possibility that "micro-managers" will attempt to implement overly intrusive management systems creating, in effect, a 24 hour "electronic bureaucracy" from which there is no escape. It is possible.

Although the scope of this paper was limited to a partial analysis of hierarchical governance choices for a telecommuting workforce, the investigation did not take into consideration other determinants of control such as professionalism, task specificity, task interdependence, incentive programs, organizational culture,

specific industry application, etc. The areas for future research and speculation are broad and the implications are numerous.

In summary, based on environmental and business trends, a significant and growing percentage of the future workforce might be one where telecommuters work from their homes, or other satellite offices, and are controlled by organizations, through technology, employing behavioral or output controls. This paper is an attempt to discern under what conditions organizations may favor one control strategy over another.

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SOMEWHERE BETWEEN MARKETS AND HIERARCHIES: CONTROLLING INDUSTRY UNIVERSITY RELATIONSHIPS FOR SUCCESS

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ABSTRACT

Since industry-university (I/U) alliances are dynamic with uncertain outcomes, governance mechanisms other than internal hierarchies and external market contracts are needed to assure that the risks and rewards of these relationships are equitably shared. To provide insight into this under-researched area, this study examines the key control factors that facilitate learning and technological outcomes in both the initial and continuing stages of I/U relationships. Findings using structural equation modeling of survey questionnaire data from 189 industrial firm senior managers reveal that a combination of flexible university IP policies, industrial firm champions, trust, and effective communications provide the control framework that is often unavailable through either hierarchical or market governance structures.

INTRODUCTION

The competitive landscape for many firms continues to be re-invented due to rapid technological change, shorter product life cycles, and intense global competition (Ali, 1994; Bettis & Hitt, 1995). In order to successfully compete and survive in this changing competitive environment, firms must continually learn and advance new technologies.

Organizational learning, and the subsequent ability to advance new technologies can be accomplished both intra- and inter-organizationally. An extensive literature continues to grow on the advantages of inter-organizational collaboration (e.g., Hail, Link & Scott, 2003; Adams, Chiang & Starkey, 2001; Jarillo, 1988; Parkhe, 1993; Pisano, 1990; Shan, Walker & Kogut, 1994) since firms are finding it increasingly more difficult to rely solely on intra-organizational initiatives due to limited expertise and resources (Tether & Tajar, 2008; D'Este & Patel, 2007; Hamel & Prahalad, 1994). While much of the inter-organizational literature concentrates on alliances between two or more industrial firms, a growing trend toward industry-university (I/U) collaboration demands that more scholarly attention focus on I/U relationships (Harryson, Kliknaite & Dudkowski, 2007, 2008; Betz, 1996; Cohen, Nelson & Walsh, 2002; Fritsch, 2003; George, Zahra & Wood, 2002; Johnson, Bianco, Grucza, Crawford & Whiteley, 2003; Quetglas & Grau, 2002; Adams, Chiang & Starkey, 2001; SRI International, 1997).

The dynamic nature of I/U alliances and the uncertainties of its outcomes contribute to making the internal mechanisms of a hierarchy or the explicit contracts of a market unreliable in providing adequate governance and control. Thus, I/U relationships often resemble an intermediate form of governance somewhere between the strict boundaries of hierarchies and external markets. Prior research has not investigated the specific governance mechanisms used to insure equity in these relationships that serve to

protect the interests of both parties (Gray, Linblan & Rudolph, 2001; Geisler, 1995). Moreover, few studies have explored the different developmental stages of I/U relationships and the specific factors facilitating each of these stages. This study addresses these needs in the literature and makes a contribution in two important ways. First, we focus on the understudied area of industry-university collaboration and closely examine two important stages of I/U relationships, i.e., the initial establishment stage and the continuing stage. Second, we explore the key antecedent governance factors that facilitate each of these two stages and investigate the possible linkage these key antecedent factors for each stage may have on learning and technological outcomes.

BACKGROUND AND RESEARCH CONSIDERATIONS

Industry-university relationships have a long history (Furman & MacGarvie, 2007). For example, the German pharmaceutical firm Bayer created relationships with universities as far back as the late 19th century (Bower, 1993). In the US, the National Research Council united scientists in the research-oriented universities with those in industry to assist the war effort during World War I (Reams, 1986). Today, industrial firms and universities work together for a number of reasons. For example, industrial firms gain access to highly trained students, professors, facilities, and new technologies (NSF, 1982a). Firms can also enhance their image and reputation when partnering with a prestigious academic institution (Fombrun, 1996). In contrast, universities primarily interact with industrial firms in order to obtain additional funds, particularly to support various research initiatives (NSB, 1996; NSF, 1982a). Research funding from industrial firms is especially appealing since it often involves less bureaucratic red tape than funds from federal or state agencies. Universities also work with firms to expose students and faculty members to practical problems, create employment and internship opportunities for university graduates and students, and to gain access to applied technological areas (Lam, 2007; Austen, 2003; NSB, 1996).

Beyond the above reasons for industrial firms and universities to interact, I/U collaboration can stimulate learning and help drive the advancement of new technologies. As an example, linkages between industry and academe have resulted in many technological advances in the area of microbiology (Pisano, 1990). Similarly, in the areas of pharmacology and chemistry pharmaceutical firms often rely upon university assisted basic research for the development of new drugs (van Rossum & Cabo, 1995). High tech sectors are not the only beneficiaries from I/U relationships. Chrysler Corporation has worked with several universities on a number of applied engineering research projects that resulted in significant knowledge and technology transfer useful in Chrysler's manufacturing value chain (Frye, 1993). With an increased emphasis by industry on working with universities, a better understanding of what is important to industry in establishing and sustaining these relationships is now needed to advance the field further (Betz, 1996; Mowery & Shane, 2002).

We recognize that inter-organizational relationships follow developmental processes (Austen, 2003; Ring & Van de Ven, 1994; Van de Ven & Poole, 1995). Therefore in teasing out what's important to industrial firms in establishing and sustaining I/U relationships, we investigate two distinct stages, i.e., the initial establishment stage and the continuing stage, and examine certain antecedent factors and the types of learning and technological outcomes generated in each of these two stages. In the following section, we present our theoretical framework and the specific hypotheses tested in this study.

THEORY DEVELOPMENT AND HYPOTHESES

Industry-university collaboration involves the commitment of considerable resources by both partners in order to create mutually beneficial outcomes that are equitably shared (Santoro, 2000). Given the uncertain nature of establishing and sustaining I/U relationships, neither the internal mechanisms of a hierarchy nor the explicit contracts of the market can be relied on to provide adequate governance and control. For example, the resources of the university are out of the hierarchical controls of their industrial partner, and similarly the firm's resources are beyond the hierarchical control of their university partner. On the other hand, if contracts alone were adequate to handle the numerous uncertainties of partnering then a market arrangement would be sufficient; an industrial firm could simply hire a university to engage in a specific research or commercialization activity. Unfortunately, the entire array of possible input and output contingencies cannot be fully anticipated, explicated, and adequately written into a contract (Santoro & Betts, 2002). Therefore, neither a hierarchical or contract governance structure can effectively deal with the many nuances and subtleties I/U relationships. As a result, I/U relationships often rely on an intermediate form of governance, such as clan control (Ouchi, 1980), relational contracting (Bolton, Malmrose & Ouchi, 1994; Fritsch, 2003; Zaheer & Venkatraman, 1995), networks (Powell, 1990) and hybrid structures (Williamson, 1991).

Clan control holds part of the key particularly when the goals of the partners and the objectives of the relationship are congruent (Ouchi, 1980; Santoro & Chakrabarti, 1999). I/U relationships can also involve relational contracting when they are long-term relationships and assets specific to the relationship are committed by each partner (Fritsch, 2003). Most often, however I/U relationships resemble hybrid governance structures, in that there can be contracts mediated by elastic control mechanisms and there are certain adaptability characteristics and incentive structures that enable the relationship to take on an intermediate form falling somewhere between the internal control of a hierarchy and the external control of the market (Williamson, 1991).

I/U relationships are volitional, goal-directed efforts where each partner's strategic choices help establish and maintain the partnership (Child, 1972; Santoro & Chakrabarti, 1999). Moreover, I/U relationships evolve over time (Santoro, 2000) and unfortunately little attention has been paid to the evolutionary processes of these relationships. Ring and Van de Ven (1994) proposed a multi-stage process for establishing and sustaining inter-organizational relationships where they identify 'negotiations' and 'commitment' stages in which expectations are explored and agreements reached, and an 'executions' stage in which partners carry out their commitments. Regarding governance, Ring and Van de Ven (1994) state that the negotiations and commitment stages establish "an initial structure of safeguards" and the executions stage is where "subsequent interactions reconstruct and embody new governance structures for the relationship" (p. 93). Following Ring and Van de Ven's (1994) treatise we adopt a two-stage model for understanding key temporal aspects of I/U relationships. Our first stage combines Ring and Van de Ven's (1994) negotiations and commitment stages into what we define as the *initial stage of an I/U relationship*. We follow their typology further by incorporating their execution stage into our model into what we define as the *continuing stage of an I/U relationship*.

Building on this two-stage model we argue that a combination of antecedent factors contribute to provide the necessary control in the initial and continuing stages of I/U partnerships that allow for mutually beneficial learning and technology outcomes. Learning and technological outcomes are important because they usually underlie the reason that industrial firms partner with universities and therefore they often serve

as a key indicator for I/U relationship success (Gopalakrishnan & Santoro, 2004; Santoro & Chakrabarti, 1999; Santoro, 2000). Through successful I/U relationships, as evidenced by generating learning and technological outcomes, firms can improve their competitive position, increase shareholder wealth, and develop a framework for pursuing future opportunities (Cohen, et al., 2002; Evans, Starbuck, Kiresuk & Gee, 1993; George, Zahra & Wood, 2002; NSB, 2000; Porter, 1980). In the following sections we elaborate on the key antecedent factors for each stage in our model and the role each of these antecedent factors play in stimulating learning and technology outcomes in the initial and continuing stages of I/U relationships.

Intellectual Property Rights, Patent Ownership and Licensing Agreements

Intellectual property rights (IPR), patent ownership, and patent licensing agreements can be a major consideration in industry-university relationships (Jelinek & Markham, 2007; Valentin & Jensen, 2007; Feldman, Feller, Bercovitz & Burton, 2002; Fine & Castagnera, 2003; George, Zahra & Wood, 2002; Reams, 1986). When the primary focus of an I/U relationship is on the development and commercialization of new technologies, IPR, patent ownership and licensing are ways that each of the partners can achieve these objectives and can therefore subsequently increase revenues, improve their competitive advantage, and increase organizational recognition. Consequently, universities and firms often compete over these rights (Phillips, 1991). Universities prefer not to grant exclusive IP and patenting rights to firms since this can mean lost revenues to the university. Beyond the revenue implications, exclusive IP and patenting rights to firms can also restrict the university's ability to freely disseminate knowledge. Many universities therefore try to retain IP as a contractual provision to any arrangement with potential industrial partners and retain all patent rights for any inventions or technological discoveries made with the use of university facilities or services (NSF, 1982b). This posture however often hinders the development of I/U relationships because industrial firms perceive this as a university being too rigid, overly self-centered, and inattentive to industry's needs (Gerwin, Kumar & Pal, 1992; Mowery & Shane, 2002).

To demonstrate to the industrial community that a university wants to encourage and spur more interactions with industry, universities must often take the first step by offering IP, patenting, and licensing policies that equitably reward their industrial partners. One way of accomplishing this is by providing industry with meaningful incentives for the development and commercialization of new technologies through flexible IPR, patent ownership and licensing policies (Bower, 1993). With an intermediate form of governance, I/U collaborations still rely on contracts in certain situations of IP, patent ownership and licensing agreements. Although the exact outcomes of I/U relationships often cannot be predicted, a range of potential learning and technological outcomes can be anticipated to some degree, which the university can negotiate within their existing policies. A university with more flexible policies for IPR, patent ownership and licensing are more likely to reach an agreement that can cover the full range of anticipated outcomes (Thursby & Thursby, 2002). On the other hand, universities that insist on more rigid and self-centered policies that do not adequately reward their industrial partner, leave the firm to choose between an inequitable arrangement or to not agreeing to the alliance at all.

It is in the initial stage of I/U collaboration that flexible university policies for IPR, patent ownership and licensing are most needed since it is here that the rights and obligations for each party is explicated prior to any collaborative work beginning (Ring & Van de Ven, 1994). Since IPR, patent ownership and licensing activities often contribute to a wide range of learning and technological outcomes, any policy agreements

consummated once collaborative work commences, i.e., the continuing stage of the relationship, can prove contentious and debilitating to the relationship. The importance of flexible IPR, patent ownership, and licensing policies diminishes over time since once there is agreement of these policies the need to revisit and radically alter these policies is minimal (Santoro & Betts, 2002). Following these combined notions we propose the following:

Hypothesis 1a: Flexible university policies for intellectual property rights, patents and licenses will be more positively related to technology outcomes in the initial stage of I/U relationships than in the continuing stage of I/U relationships.

Hypothesis 1b: Flexible university policies for intellectual property rights, patents and licenses will be more positively related to learning outcomes in the initial stage of I/U relationships than in the continuing stage of I/U relationships.

The Role of I/U Champions

In establishing and sustaining I/U collaborations, sufficient time and effort must be expended in order to identify potential partners, develop an appropriate collaborative agenda, and ensure that results are indeed mutually beneficial solutions to targeted areas of opportunity (Plewa & Quester, 2008; Santoro & Chakrabarti, 1999). An empowered and influential individual, or champion, responsible for boundary spanning activities does much to insure these goals are attained.

The value of champions have been long been recognized, particularly in the area of industry-university collaborations. For example, studies by both Gerwin and colleagues (1992) and van Dierdonck, Debackere and Engelen (1990) found that champions are an important facilitating factor in I/U relationships because champions often provide needed control and governance. While the literature is pretty clear on the importance of champions, questions persist as to how champions go about accomplishing these activities. We follow work done by Ancona and Caldwell (1990) and believe that effective industry-university champions serve a number of diverse roles. First, champions must be the scouts who seek external information about potential liaisons. Second, champions must be ambassadors responsible for establishing and sustaining good relations. Third, champions must be sentries responsible for monitoring activities between the firm and the university. Fourth, champions must be guards who protect against any potential negative internal and external threats to the relationship.

Successful I/U relationships mean that universities must conduct research that industry really needs. In the same way, industry must become aware of, and utilize the kinds of research that universities conduct (Kotnour & Buckingham, 2001; Sparks, 1985). In bridging this gap, there must be frequent, ongoing, and personal interactions between university personnel and their industry partners. As scouts and ambassadors, I/U champions are the key figures that must develop good interpersonal relationships between the partnering organizations. Effective champions are also sentries and guards by providing necessary guidance and direction in all stages of the industry-university relationship (Ancona & Caldwell, 1990; Austen, 2003; Frye, 1993). In doing so, effective champions must be technologically knowledgeable, spontaneous in response to fluid market dynamics and protective of their organization's needs and interests. They must also be

sensitive and delicate in their handling of the philosophical and cultural differences that usually exist between academe and industry (van Dierdonck, et al., 1990).

Ultimately, it is most often the case that the industrial firm determines its level of resource commitment and involvement in I/U relationships (Santoro & Chakrabarti, 1999). That may explain why Santoro and Chakrabarti (2002) found that champions at the industrial firm were more important to the intensity level of knowledge transfer, technology transfer, cooperative research, and research support I/U activities than were their university counter-parts, i.e., champions affiliated with the university. We follow Santoro and Chakrabarti's (2002) findings; that industrial firm champions are more influential in I/U relationships than are champions affiliated with the university. However, we build upon and extend their notion in this research by arguing that I/U champions at the firm play a greater role in advancing learning and technological outcomes in both the initial and continuing stages of I/U relationships than their university counter-parts. More formally we therefore propose,

Hypothesis 2a: The presence of an I/U champion at the firm will be more positively related to the level of technology outcomes in both the initial and continuing stages of I/U relationships than the presence of an I/U champion at the university research center.

Hypothesis 2b: The presence of an I/U champion at the firm will be more positively related to the level of learning outcomes in both the initial and continuing stages of I/U relationships than the presence of an I/U champion at the university research center.

Communication Effectiveness

Effective communications are important to the governance of I/U relationships particularly communications related to the status of the relationship and to performance feedback since both these communications can enhance and improve subsequent relationship performance (Hequet, 1994; Husman, Lahiff & Penrose, 1988; Kotnour & Buckingham, 2001).

In the initial stage of I/U relationships, role expectations are just beginning to crystallize and interactions between participants are more of a formal nature (Ring & Van de Ven, 1994). Over time, as the relationship matures, participants in industry-university relationships learn more about each other and interactions become more personable. When interactions become more personable, communications become more effective and are of more use in governing the relationship (Kotnour & Buckingham, 2001). As such, communications may not be as effective in the initial stages of I/U relationships, but become more so in the continuing stage of the relationship. Besides leveraging interpersonal relationships to aide in governance, effective communications in the continuing stage of I/U relationships help the dissemination of information to the industrial partner, thereby enabling the firm to adapt and integrate learning as it occurs (Santoro & Saparito, 2003; Starbuck, 2001).

Since our focus of this study is on what is important to industrial firms in establishing and sustaining I/U relationships, effective communications refer to the transfer of information by the university research center to their industrial firm partners. Specifically of interest here is the effectiveness, or lack of, with which

the university research center provides feedback to their industrial firm partners on the status and results of joint I/U relationship activities. The following hypotheses reflect this notion:

Hypothesis 3a: Effective communications by the university research center will be more positively related to the level of technology outcomes in the continuing stage of I/U relationships than in the initial stage of I/U relationships.

Hypothesis 3b: Effective communications by the university research center will be more positively related to the level of learning outcomes in the continuing stage of I/U relationships than in the initial stage of I/U relationships.

The Value of Trust

I/U relationships offer many situations that are unanticipated and are not easily controlled by formal arrangements (Bower, 1993). Effective cooperation between the university and their industrial partner depends upon the way in which the two organizations work with each other, relate to each other, and consequently trust each other (Plewa & Quester, 2006; Fritsch, 2003; Santoro & Saparito, 2003; Phillips, 1991). Trust is "the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other party will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party" (Mayer, Davis & Schoorman, 1995:712). Since our interest in this study is on what's important to the industrial firm in establishing and sustaining I/U relationships we focus on the industrial firm's trust, i.e., being the *trustor*, of its university partner, i.e., the university being that *other party*.

The industrial firm must be willing to be vulnerable to the university research center since in I/U relationships the industrial firm may forfeit a certain amount of control over its financial resources and competencies when they contribute them to the I/U partnership (Powell, 1990). For the industrial firm this is significant since a reduction in resource control can negatively impact the firm's current and future competitive advantage since the firm no longer has sole possession or unconditional access to its intellectual property (Pfeffer & Salancik, 1978). Moreover, in the case of non-patented products or services, the firm could experience unprotected technology transfer and any pre-competitive work can negatively impact the firm's ability to leverage its IP into a first mover competitive advantage if other industrial firms are able to obtain this knowledge (Zhao & Reisman, 1992). These possible threats are punctuated when the industrial firm and university exchange tacit knowledge through intense common activities and practices (Spender, 1994) and can be especially damaging to the firm should its I/U arrangement prove to be only short-term or (Pisano, Russo & Teece, 1988). For these reasons we argue that a firm's trust in its university partner is important in both the initial and continuing stages of I/U relationships, however trust's effect may be different for learning outcomes compared to technology outcomes.

The firm's trust in its university partner as a governance mechanism puts the firm at risk of adverse selection and moral hazard (Ring & Van de Ven, 1994). To minimize these risks industrial firms are more likely to rely on trust as an appropriate governance mechanism for the outcomes generated in the relationship that are least vulnerable. We argue that trust may be an appropriate safeguard against opportunistic behavior by its university partner for learning outcomes since they may not be readily converted by the firm into an

immediate source of competitive advantage. In contrast, trust may be an insufficient governance mechanism for the more easily transferable and more immediately convertible technology outcomes. We therefore formally propose,

Hypothesis 4a: The firm's trust of its university partner will be negatively related to the level of technology outcomes in both the initial and continuing stages of I/U relationships.

Hypothesis 4b: The firm's trust of it's university partner will be positively related to the level of learning outcomes in both the initial and continuing stages of I/U relationships.

RESEARCH METHOD

Overall Research Approach

A multi-method field study was used. First, two different sources of exploratory data were initially collected and analyzed in order to develop our theoretical framework and structure our overall study. The initial set of exploratory data included recent program evaluations and survey protocols from National Science Foundation (NSF) supported Engineering Research Centers (ERCs) and Industry-University Cooperative Research Centers (IUCRCs). University research centers such as ERCs and IUCRCs became the focal point of this study since they encompass diverse I/U relationships having an explicit mission to advance knowledge and new technologies with industry (Betz, 1996; Geisler, 1995; Mowery & Shane, 2002). Next, fifteen semi-structured interviews were then conducted. These fifteen face-to-face and phone interviews were conducted with both industrial firm representatives and university research center directors in order to add depth and breadth to the secondary data and to provide face validity to our survey questionnaire.

Upon completion of the exploratory data, a variety of university research centers in prominent public and private US universities were contacted. Twenty-nine university research centers were originally contacted, twenty-one agreed to participate in this study (approval rate of 72%). Those opting not to participate did so largely due to time and resource constraints. The twenty-one participating university research centers provided complete lists of their corporate partners. A survey questionnaire was then mailed to each industrial firm representative identified and this data were used for hypotheses testing.

To complete the data collection, in-depth, structured interviews were conducted in order to validate the survey questionnaire data and to obtain additional details. Interviews were conducted with a total of 31 firms in the semiconductors (10 firms), metals and fabricated metals (12 firms), manufacturing (5 firms), and biotechnology (4 firms) industrial sectors.

Sample

The twenty-one participating university research centers consisted of eight NSF supported Engineering Research Centers, eight NSF supported Industry University Cooperative Research Centers, and

five research centers outside these models. The twenty-one centers represented a diverse, cross-section of disciplines, e.g., optics, large structural systems, off shore drilling, with a wide variation of member companies. This wide cross-section of firms and research centers provided us with the possibility for greater generalizability beyond the idiosyncratic nature of one particular center or one industry environment. On average, each participating research center works with twenty industrial firms. In total, the 21 centers collaborate with 421 industrial firms. Survey questionnaires were sent to all 421 firms. 207 questionnaires were returned, but five were missing significant data. Thus, 202 responses were useable for a response rate of 48%. An analysis was conducted to determine if any response bias existed. No significant differences were found between those responding compared to those not responding based on firm size, industrial sector, partnering research center, or length of relationship.

Our respondents were senior-level members of their firms, e.g., VPs/Directors of R&D, Directors of Technology or Project Managers. Each of these respondents was thoroughly knowledgeable about the I/U relationship, actively involved in the relationship, and had a significant stake in the collaborative venture. Five of the participating firms had more than one person involved in their I/U relationships. In these situations survey questionnaires were sent to each participant within the firm with the multiple responses aggregated into one score for the firm. The average of the two responses in three firms or in two firms the three responses, were used to reflect the firm's collective insight on their relationship with the university research center (Rosenthal & Rosnow, 1991). The data aggregation was done since each participant was knowledgeable about the I/U relationship and each had a significant stake in the relationship. Moreover, the participants were homogeneous since formal I/U relationship objectives existed in each of the firms. Homogeneity was confirmed by high inter-rater reliability (Spearman-Brown Formula = .74 mean individual and .85 mean aggregate reliability for two participants and .71 mean individual and .89 mean aggregate reliability for three participants). As a result of data aggregation, our sample size for analyses was 189.

With respect to firm size, the majority of firms were large. That is, 125 firms or 66% had at least 500 employees while 64 of the firms or 34% were small having fewer than 500 employees. The large firms were quite diverse with respect to size. Some firms had as few as 500 employees while a number of the firms had several hundred thousand employees. The small firms also represented a wide range; a few of these firms had as little as two employees while many firms fell just below the 500 employee threshold. Regarding industry representation, two-digit SIC classifications were used and showed that 21 industries were represented. The largest number of industry concentrations came from the following: industrial/commercial machinery (30 firms), microelectronics and computers (27 firms), chemical or allied products (20 firms), and primary metals or fabrication (17 firms). The smallest number of industry concentrations came from the following industries: paper or allied products (3 firms), food or kindred products (3 firms), military unit (4 firms), and agriculture (4 firms). To further segment our sample, Lawrence's (1984) industrial sector categorization scheme was used and showed 120 of the firms were classified as high tech, 33 firms capital intense, 27 firms resource intense, and 9 firms labor intense.

Measures

The measures used in this study were adapted from the literature and modified slightly to tap into our specific constructs based on input obtained in our exploratory interviews. Each measure utilized seven-point Likert-type scales ranging from such items as "not at all important" (a one on the seven point scale) to "very

important" (a seven on the seven point scale). Since our exploratory interviews indicated that the dynamics in the initial stage of I/U relationships often differ from the continuing stage, we captured data at these two distinct points in time. Specifically, the initial stage refers to the time at which the I/U relationship was first established. The continuing stage refers to the first three years after the relationship was established. Each of the measures listed below were used to capture the constructs at these two points in time, i.e., the initial stage and the continuing stage.

Flexible policies for intellectual property rights (IPR), patents, and licenses.

Flexible policies for intellectual property rights (IPR), patents, and licenses were measured by a one-item scale for each stage, i.e., the initial stage and continuing stage. We asked respondents how important it was to the industrial firm that the university research center customize contractual agreements for IPR, patent ownership, and licensing in order to meet the firm's specific needs.

Presence of an I/U champion at the industrial firm.

A one-item scale for each stage, i.e., initial stage and continuing stage, was used to capture the presence and influence of a dedicated individual at the firm who served as champion. We asked respondents the extent to which there was a dedicated individual in the firm who maintained on-going relations, monitored the relationship's on-going activities, and guarded against any internal or external threats to the on-going relationship (Ancona & Caldwell, 1990).

Presence of an I/U champion at the university research center.

A one-item scale for each stage, i.e., initial stage and continuing stage, was used to capture the presence and influence of a dedicated individual at the university research center who served as champion. We asked respondents the extent to which there was a dedicated individual at the university research center who maintained on-going relations, monitored the relationship's on-going activities, and guarded against any internal or external threats to the on-going relationship (Ancona & Caldwell, 1990).

Communications effectiveness.

Communications effectiveness was measured with a one-item scale for each stage, i.e., initial stage and continuing stage. We asked respondents how effective the university research center was in communicating the status and results of activities directly related to the industrial firm's relationship with the university research center.

Trust.

Trust was measured by a three-item scale (alpha = .70) for each stage, i.e., initial stage and continuing stage. We asked respondents at the firm the following three questions. 1) the extent the firm was willing to share ideas, feelings, and specific goals with the university center, 2) the extent to which the firm doubted

the university center's competence as well as the center's motives and fairness in sharing their abilities (reverse score), and 3) the extent to which the firm perceived that the university center adhered to a set of principles that the firm found acceptable.

Technology outcomes.

Technology outcomes were measured by a four-item scale (alpha = .92) for each stage, i.e., initial stage and continuing stage. We asked respondents at the firm to approximate the technology output generated as a direct result of the I/U relationship. The four items used in this measure were the following: 1) the number of patents, 2) the number of patent applications, 3) the number of licenses, and 4) the number of non-patented and non-licensed products and processes. The number of non-patented and non-licensed products and processes (item 4) were combined into a single item since our exploratory interviews and previous research showed that singularly, low levels of these outcomes are generated in any one I/U relationship (NSB, 2000; NSB, 1996).

Learning outcomes.

Learning outcomes were measured by a three-item scale (alpha = .91) for each stage, i.e., initial stage and continuing stage. We asked the respondents to approximate the knowledge output generated as a direct result of the I/U relationship. The three items used for this measure were the following: 1) the number of research papers published, 2) the number of research papers presented at conferences, and 3) the number of master's theses and doctoral dissertations generated as a direct result of their relationship with the university center.

Structural Equations Analysis

Structural equation modeling was used to estimate the strength of relationships between all variables examined in this study (Maruyama, 1998) where estimated measurement models were created to examine the initial and continuing stages of I/U relationship success as represented by the level of learning outcomes and technology outcomes. In doing so, we estimated the full structural equation models and tested for model equivalence. The equivalence of specific paths were tested and finally structural equation trimmed models were tested against the full models. We used Joreskog and Sorbom's LISREL 8.11 structural equation modeling program with the input for the LISREL program being a 22 X 22 covariance matrix.

For each stage, i.e., initial and continuing stage, technology outcomes, learning outcomes, and trust were multiple indicator latent variables with 4, 3, and 3 indicators respectively. The remaining variables were single indicator latent variables for each stage. As such, the error variances were set to zero for these variables (Bollen, 1989) while the LISREL 8.11 program automatically sets the variance of these latent variables to 1 as a default. The error terms of the dependent variables (learning outcomes and technology outcomes) were allowed to correlate due to the probable presence of unmodeled common causes.

Table 1: Means, Standard Deviations, and Correlations among Variables

	Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	s.d.	Mean	Variable
1	IPR	5.03	1.8		0.14	0.18	-0.06	-0.13	-0.05	-0.09	0.09	-0.01	-0.04	0.02	1.72	5.35	IPR
2	I Champ	5.82	1.12	0.18		0.6	0.15	0.06	0.08	-0.1	0.23	0.07	0.11	0.09	1.18	5.85	I Champ
3	I Champ	5.78	1.14	0.22	0.58		0.03	0.11	-0.09	-0.05	0.12	-0.01	-0.04	-0.08	1.19	5.79	I Champ
4	Comm	4.55	1.33	-0.05	0.1	0.06		0.28	0.25	0.28	0.49	0.55	0.53	0.5	1.24	5.17	Comm
5	Trust 1	5.22	1.26	-0.17	0.12	0.12	0.41		0.44	0.38	0.07	0.3	0.29	0.24	1.16	5.53	Trust 1
6	Trust 2	5.13	1.28	-0.07	0.16	-0.06	0.39	0.43		0.43	0.22	0.3	0.34	0.34	1.38	5.37	Trust 2
7	Trust 3	5.27	1.12	-0.14	-0.02	-0.05	0.38	0.27	0.41		0.09	0.26	0.3	0.31	1.36	5.25	Trust 3
8	Tech	2.02	1.26	0.32	0.19	0.12	0.02	-0.06	0.03	-0.02		0.52	0.5	0.49	1.22	2.33	Tech
9	Learn 1	2.65	1.55	0.23	0.13	0.12	0.09	0.15	0.04	0.12	0.53		0.91	0.73	1.53	3.08	Learn 1
10	Learn 2	2.75	1.56	0.22	0.13	0.09	0.11	0.16	0.06	0.1	0.54	0.9		0.74	1.52	3.17	Learn 2
11	Learn 3	2.6	1.47	0.18	0.18	0.07	0.03	0.12	0.12	0.11	0.55	0.73	0.75		1.47	3.11	Learn 3

N = 189, Lower diagonal is initial industry/university relationship success and upper diagonal is continuing industry/university relationship success
Correlations > .19 are significant at the .01 level (2-tailed)
Correlations > .15 are significant at the .05 level (2-tailed)

RESULTS

Descriptive Statistics and Measurement Model

Descriptive statistics for all indicator variables are displayed in Table 1. A two-group analysis procedure was used. In this method, parameter estimates for two groups, in this case the initial and the continuing stages of the I/U relationship, were estimated simultaneously with fit statistics reflecting the fit of both groups jointly. The factor loadings for our variables were estimated twice, first constrained to be equal in both initial and continuing relationship situations and then free to vary between the situations. All of the path coefficients in the free and constrained models were highly significant ($p < 0.001$). The difference in chi-squared between the constrained and free models was not significant ($p > 0.05$). This indicates that the constrained and free models are not different. Based on these results we are confident that we measured the same constructs in each of the models. From this point on in our analysis we used separate measurement models in order to estimate trimmed path models for each of the two situations, i.e., initial stage and continuing stage.

Table 2: Structural equation modeling Fit Statistics					
Model	χ^2	RMSEA	GFI	CFI	IFI
Measurement model	175.52 ***	.048	.92	.95	.95
Trimmed path models					
Initial relationship	52.07 *	.053	.95	.98	.98
Continuing relationship	63.33 *	.068	.94	.97	.97
* $p < 0.05$ *** $p < 0.001$					

The fit statistics reported in Table 2 include the chi-square statistic, root mean square error of approximation (RMSEA), and three fit indexes: goodness of fit index (GFI; Joreskog & Sorbom, 1993), comparative fit index (CFI; Bentler, 1990) and incremental fit index (CFI; Bollen, 1989). The chi-square results for both the constrained and free models were significant suggesting that we use measures of fit other than the chi-squared statistic (Bollen, 1989; Joreskog & Sorbom, 1993). Values between .05 and .08 on the RMSEA indicate a good fit, and values below .05 indicate a very good fit (Browne & Cudeck, 1993). For the three fit indexes (GFI, CFI, IFI) values of above .90 indicate good fit. As table 2 shows, the RMSEA and fit indexes strongly suggest a good fit for both the measurement model and trimmed path models.

Tests of Hypotheses

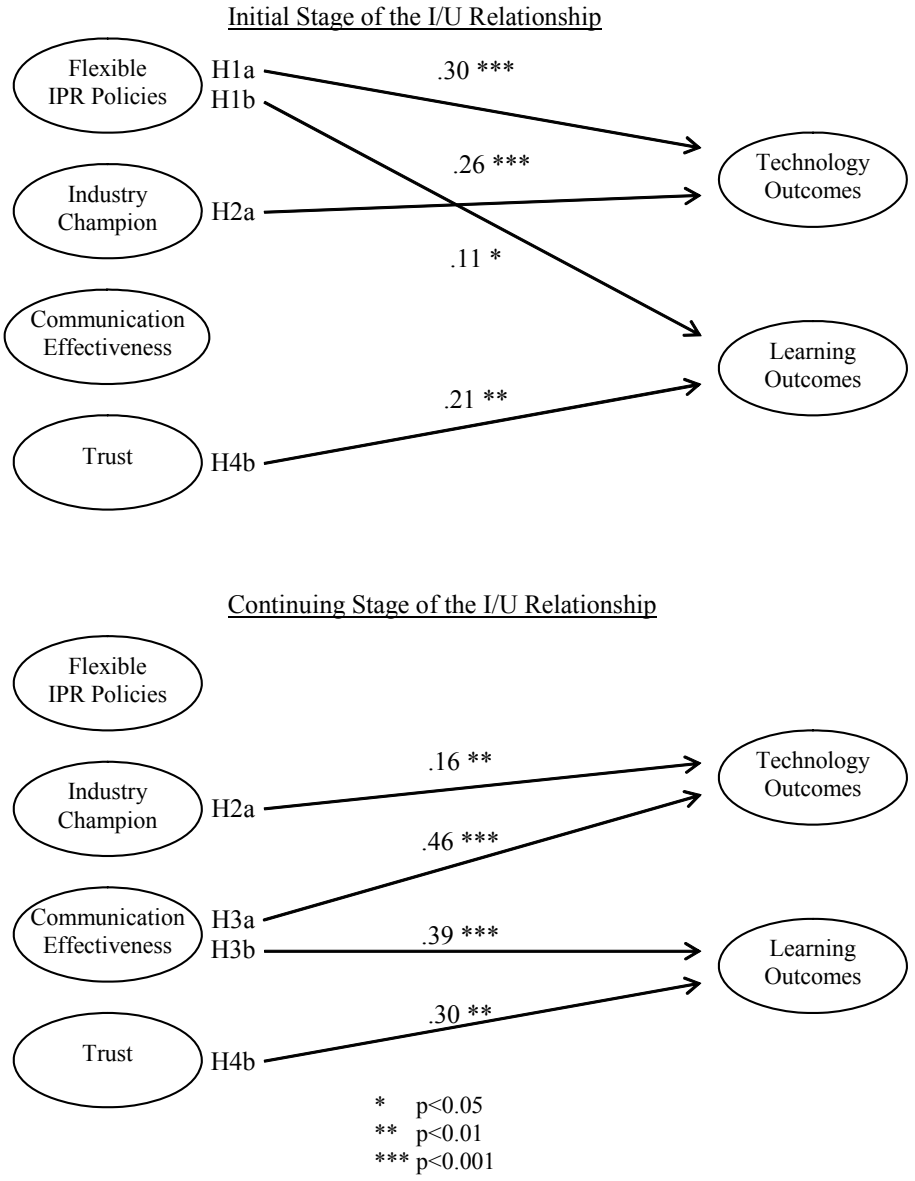
Figure 1 shows the final trimmed structural path models for each time frame and displays the significant relationships in each of the models. The full measurement model originally contained a path for each hypothesis. For parsimony, as the path models were developed, insignificant relationships were eliminated from the models. In the final trimmed models, displayed in Figure 1, each path indicates where there is significant support for the corresponding hypothesis noted.

As figure 1 shows, we found support for hypotheses 1a and 1b. The inclusion of the paths between flexible intellectual property rights and both technology outcomes and learning outcomes in the initial stage of I/U relationships indicates that both hypotheses 1a and 1b were supported in the initial stage (path coefficients = 0.30 and 0.26 respectively, $p < 0.001$). In contrast, our results show that flexible policies for IPR, patents, and licensing are not significant in the continuing stage of I/U relationships. As such, the paths between flexible intellectual property rights and both technology outcomes and learning outcomes were trimmed from the model in the continuing stage of the relationship since these paths were not significant.

We found support for hypothesis 2a. That is, significant relationships exist between industrial firm I/U champions and technology outcomes in both the initial (path coefficient = 0.11, $p < 0.05$) and continuing (path coefficient = 0.16, $p < 0.01$) stages of I/U relationships while no significant relationships exist between university center I/U champions and technology outcomes. For parsimony, university center I/U champions were trimmed from each of these models since their relationship to technology outcomes and learning outcomes were not significant in either the initial stage or the continuing stage. Contrary to our a prior

notion, we did not find support for hypotheses 2b since no significant relationships were found between I/U champions at the firm and learning outcomes at the initial and continuing stages of I/U relationships.

Figure 1 - Trimmed Structural Models for Each Time Frame with Path Coefficients



Hypotheses 3a and 3b were both supported; that effective communications by the university research center are more positively related to technology outcomes and learning outcomes in the continuing stage than in the initial stage of I/U relationships. Specifically, the paths between communications effectiveness and both technology outcomes and learning outcomes were trimmed from the model for the initial stage of I/U relationships, indicating no significant relationship. Consistent with hypotheses 3a and 3b, there were significant paths between communications effectiveness and both technology outcomes and learning outcomes (path coefficients = 0.46 and 0.39 respectively, $p < 0.001$) in the continuing stage of I/U relationships.

Hypothesis 4a was not supported because the paths between trust and technology outcomes were not significant in both the initial and continuing stages of I/U relationships. The paths between trust and technology outcomes were therefore trimmed from both the initial stage and continuing stage models as displayed in Figure 1. Hypothesis 4b was supported because the paths between trust and learning outcomes were positive and significant for both the initial and the continuing stages (path coefficient = 0.21 and 0.30 respectively, $p < 0.01$). Further comparative analysis of these two path coefficients revealed a significant difference between these two coefficients (Δ path coefficients = 0.09, $p < 0.05$) indicating that trust is more strongly related to learning outcomes in the continuing stage of I/U relationships than in the initial stage of I/U relationships.

DISCUSSION

Conclusions and Implications

The results of this study suggest that several factors combine to provide control and governance at different stages of industry-university relationships. With a complementary combination of these elements in place, industry-university relationships can be beneficial collaborative endeavors by stimulating learning and technological outcomes. The results also indicate that there are both similarities and differences in the factors that are associated with the initial stages of I/U relationships compared to the continuing stage of I/U relationships. The following discussion elaborates upon the specific factors that are important in the two different stages of I/U relationships and their role in the outcomes generated.

Factors associated with outcomes in specific stages of I/U relationships.

Two factors were found to be significantly linked with both learning outcomes and technology outcomes, but each of these factors were important only in either the initial stage or continuing stage of the I/U relationship but not both. Specifically, flexible intellectual property rights, patenting, and licensing policies was associated with both learning outcomes and technology outcomes in the initial stage while communications effectiveness was linked to both learning outcomes and technology outcomes in the continuing stage of an I/U relationship.

Our finding that flexible intellectual property rights, patenting, and licensing policies were linked to both learning and technology outcomes only in the initial stage suggests that firms and university research centers finalize those policies in the initial stage based on each organization's needs (Santoro & Betts, 2002). It also implies that if a university research center's policies on intellectual property rights, patenting, and

licensing are rigid and unresponsive to the industrial firm's needs, these policies could create a serious impediment to the successful establishment of the I/U partnership.

Although our results show that flexible intellectual property rights policies are important for both learning outcomes and technological outcomes, we believe the reasons for their importance are different for each outcome. In the case of learning outcomes, industry is most concerned that the university research center respect the firm's need to keep proprietary knowledge closely held through such things as copyrights and shared authorship. With regard to technology outcomes, a firm is able to maintain its competitive advantage only when patent and licensing policies facilitate the firm's development and commercialization of first-mover technological advances.

Effective communications and learning outcomes and technology outcomes in the continuing stage of I/U relationships.

Our results support and are consistent with the work of other researchers suggesting that effective communications are important in sustaining inter-organizational relationships (e.g., Hequet, 1994; Husman, Lahiff & Penrose, 1988; Lind & Zmud, 1995). Our finding that effective communications were not linked to either learning outcomes or technology outcomes in the initial stage of I/U relationships but were in the continuing stage may indicate that effective communications are not easily achievable in collaborative ventures. Rather, effective communications may need to develop over time as interpersonal relationships across organizations mature (Ring & Van de Ven, 1994). We suspect that in the initial stage of I/U relationships, communications are dominated by more formal role interactions and as a result the effectiveness of the communications between partners is also harder to evaluate. As the relationship endures, formal role interactions are replaced with more interpersonal relationships and as these more personal communications intensify they become not only more effective but easier to evaluate. It is this combination of more personal interchanges and their evaluation that together help determine effective communications (Lind & Zmud, 1995). Additionally, a variation in the university research center's ability to communicate effectively can be triggered by many factors; i.e., depending upon the personality, experience, communications skills, and/or prior relationships of the industrial firm representatives, the university research center director and his/her associates may be more effective in communicating with some firms than with others (Husman, Lahiff & Penrose, 1988). Thus, while we were interested in the firm's perspective of how well the university research center communicated with them, the firm could very well be a key source for this effectiveness or ineffectiveness (Lind & Zmud, 1995).

Factors associated with a specific type of outcome.

Two factors were significantly linked with one of the two outcome variables in both the initial stage and the continuing stage of I/U relationships. The first factor was between industrial firm champions and technology outcomes; the second factor was between trust and learning outcomes.

Industrial Firm Champions.

Our results show that champions at the industrial firm are linked to technology outcomes in both the initial and continuing stages of an I/U relationship. This finding is consistent with Ancona and Caldwell's (1990) typology where they suggest that champions perform 'scout' and 'ambassador' roles during initial stages of a relationship. Of course an industrial firm champion would be primarily interested in outcomes of value to their organization, hence the initial link to technological outcomes where value is more easily measured and quantified. Moreover, industrial firm champions are interested in technology outcomes since they can have the greatest potential for providing an immediate and tangible return on I/U relationship investments (Bower, 1993). Our finding that an industrial firm champion is pivotal throughout both stages of an I/U relationship implies that maintaining the same individual as champion is paramount since the expectations and roles of these individuals become socially embedded over time (Ring & Van de Ven, 1994). A champion from the industrial firm who is involved with the project over time has a better ability to determine the adjustments that need to be made to protect the interests of the industrial partner and are able to make sense of changing situations (Santoro & Chakrabarti, 2002). Champions also occasionally assume the role of overseeing the training of individuals new to a project, an important consideration in universities where there may be considerable turnover of students working on the project and where faculty and students moving in and out of the research center detract from personnel continuity.

Our results showing that champions at the firm were linked to technology outcomes but not to learning outcomes may be explained by considering that champions often serve as a substitute for trust. That is champions, like trust, reduce uncertainty by providing formal guidance and structure to a relationship (Quinn, 1985). Due to the influence champions exert, they provide a more formal control mechanism than does trust. Technology outcomes involve a higher risk because the results are often directly applicable and the benefits are more specific and tangible. The focused nature of developing specific technologies requires greater control and influence than learning outcomes, which can be more amorphous (Tornatzky & Fleischer, 1990). In the case of developing radically new technologies, the inertial and rigid forces of the status quo must be challenged through a new regime of thinking and acting (Dougherty & Heller, 1994). This new regime of thinking and acting can often be advanced through the adroitness of an influential champion since an empowered champion reduces the risk to the other parties involved by placing the risk on themselves (Ancona & Caldwell, 1990).

Consistent with our a priori logic and with previous work by Santoro and Chakrabarti (2002), the results also show that an industry champion was more important than a university champion. This finding may indicate that the firm believes that its own champion is more important to the success of I/U relationships than other key individuals involved in the collaborative venture. Or, it may simply reflect the firm's inability to evaluate the importance of those individuals, particularly the champion affiliated with the university research center. Quite possibly, had our focus been on what's important to the university research center we may have found that university research center respondents felt their champions were more critical to the success of I/U relationships. Thus, our findings may indicate that the utility of a champion is best recognized and assessed in the home of the champion (Schon, 1963) pointing toward a fundamental attribution error (Ross, 1974) regarding the value of one's own champion. Since our focus in this study did not concentrate on this potentially intriguing aspect, more research is needed to tease this out.

Trust and learning outcomes.

Our results indicate that the firm's trust in its university partner is important in both the initial and continuing stages of I/U relationships with respect to learning outcomes but not to technological outcomes. Having trust linked to learning outcomes but not to technology outcomes may indicate that trust reduces uncertainty about the actions of the other parties in the relationship and about the expected outcomes and is therefore an informal regulatory process that substitutes for formal control mechanisms (Das & Teng, 1998). When betrayed, the betrayed has been met with unpleasant and unexpected surprises regarding these expectations. A betrayal of trust could manifest itself in low levels of learning outcomes due to a lack of cooperation in sharing knowledge and/or through the inappropriate sharing of knowledge (Bhattacharya, Devinney & Pillutla, 1998). Moreover, since wide participation among participants is needed in creating learning (Tornatzky & Fleischer, 1990) sharing of ideas is a necessity. It is unlikely that significant learning outcomes developed through such widespread participation can be held by any one party which means that the question is not whether learning outcomes are shared, but rather whether or not the parties can be trusted to actively participate in the ongoing process. Finally, the benefits of learning in I/U relationships and the manifestation of its outcomes are largely intangible and often hard to distinguish. Since it is often difficult to determine who the appropriate beneficiaries are for inter-organizational learning, trust among alliance partners is important since the judgment for knowledge dissemination can be unclear and perplexing (McAllister, 1995).

To summarize, I/U relationships can be beneficial by producing both learning and technological outcomes. We argue in this paper that I/U relationships have an intermediate form of governance, somewhere between the hierarchical control of either organization in the partnership and market contracts. In order to obtain the maximum benefits from these dynamic relationships certain controls must be set in place. Through this study we've illuminated certain control factors that work in tandem to help govern and control I/U relationships and allow for the equitable distribution of risks and rewards based on two important stages of the relationship. Specifically, a combination of flexible intellectual property rights policies, a champion in the industrial firm, and a firm's trust in its university partner can be those controls that facilitate success, as measured by learning and technological outcomes, in the initial stage of an I/U relationship. As an I/U relationship matures, i.e., the continuing stage, an industrial firm champion, the firm's trust in its university partner, and effective communications become especially important.

Limitations and Suggestions for Future Research

While this study helps to deepen and broaden our knowledge of I/U relationships, this investigation has limitations. One limitation has to do with perspective. With a primary focus on the industrial firm, important factors for I/U relationships from the university research center's perspective were not examined. Exploring such things as the existence or lack of effective leadership in the university research center or personality conflicts between the university research center director and industrial firm participants could also prove beneficial in understanding this aspect.

Second, we defined I/U relationship success by the creation of learning outcomes and technology outcomes within two distinct stages of the collaborative venture. Our snapshot in time of the initial and continuing stages is helpful but does leave many unanswered questions. First, there are a number of

alternative multi-stage models of inter-organizational collaboration (Ring & Van de Ven, 1994; Van de Ven & Poole, 1995) which cannot be differentiated with observations at only two points in time. Moreover, our reliance on learning outcomes and technology outcomes as measures of I/U relationship success may not be broad enough. Additional measures such as length of relationship and firm performance may offer additional insights.

Another consideration is that the industry-university technology relationships examined in our study were largely based in NSF supported technology research centers affiliated with US universities. Although this provided us with a diverse array of firms, relationships, and outcomes, this largely confined our study to US borders. A similar investigation examining I/U technology relationships in university technology research centers located in a variety of different countries will serve to extend and enhance these findings. In fact, there is new and growing literature that addresses I/U collaborations in other countries (Hanel & St Pierre, 2006). Some areas of the world investigated are Valencia, (Garcia-Aracil, 2008), Japan (Fukugama, 2005; DeBroux, 2008), Nigeria (Adeoti & Adeoyi, 2005), Europe (Harryson, Kliknaite & von Zedwitz, 2008; Dooley & Kirk, 2007), the UK (D'Este & Patel, 2007), Canada (Heale, Shapiro & Egri, 2004) and China (Harryson, Kliknaite & von Zedwitz, 2008; Wang & Lu, 2007).

Finally, our results show that industrial firm champions are particularly important for influencing both learning and technological outcomes. Future research could consider exploring the exact role that champions play by examining the full range of activities in which they engage, the nature of champion goals and reward systems, and the affect of cultural dimensions on the their role and contributions.

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COMPETITIVE NETWORK AND COMPETITIVE BEHAVIOR: A STUDY OF THE U.S. AIRLINE INDUSTRY

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ABSTRACT

Drawing upon the embeddedness perspective, multipoint competition, and resource-based view, I conceptualize the competitive network based on multimarket contact and resource homogeneity. A competitor analysis should not remain only at the dyadic level, but rather should expand to the whole competitive network. I hypothesize certain effects of a firm's position in the market network and resource network on its competitive behavior. Specifically, the more central a firm is in the competitive network, the more competitive activities the firm will conduct and the more intense the rivalry experienced by it. Also, the more structurally constraint a firm is in the competitive network, the less competitive activities will be conducted by the firm and the less intense the rivalry experienced by it. I also hypothesize that competitive activities and intensity of rivalry will negatively affect organizational performance. Using network analysis, I empirically tested these hypotheses for the case of the U.S. scheduled airline industry during the period 1998 to 2000. The results support my arguments. This study will advance an integrated understanding of the embeddedness perspective, multipoint competition, and resource-based view.

INTRODUCTION

The study of competitive behavior and of inter-firm rivalry has become a central area of research in strategy (Porter, 1980). To understand and predict this interactive competitive behavior, previous research has investigated the effect of multipoint competition on intensity of rivalry between dyadic pairs (Barnett, 1993; Barnett, Greve, & Park, 1994; Chen, 1996; Evans & Kessides, 1994; Gimeno & Woo, 1996b). Meanwhile, researchers have conceptualized competitor analysis at the dyadic level (Chen, 1996). However, no study has conceptualized competitor analysis at the industry-system or network level or examined the effects of a firm's position in a competitive network on its competitive behavior. To obtain a more comprehensive understanding of competitor analysis and competitive behavior, I have conceptualized the competitive network and have empirically tested my theoretical model. My central research question is how a firm's structural positions in a competitive network affect its competitive behavior and ultimately its organizational performance.

The embeddedness perspective (Baum & Dutton, 1996; Dacin, Ventresca, & Beal, 1999; Granovetter, 1985) suggests that competitors are not atomistic entities free to undertake any competitive action, but rather

are embedded in a network of relationships that influences their competitive behavior. Although the effect of cooperative linkages between firms on competitive dynamics has received a great deal of attention (Gnyawali & Madhavan, 2001; Madhavan, Gnyawali, & He, 2004), no researchers have investigated the effect of competitive linkages between firms. In this paper, I will study these negative connections among competitors within the same industry. A firm's structural position in a competitive network will significantly influence the information flow among the network members and consequently will influence its awareness of competitive activities as well as its motivation and capability to conduct such.

Multipoint competition research has studied the effect of multimarket contact on dyadic rivalry in a given market (Gimeno & Woo, 1996a, 1996b, 1999; Young, Smith, Grimm, & Simon, 2000). However, I argue that firms compete in multiple markets against multiple competitors. The shared markets among competitors constitute one part of what I define as a competitive market network. The second part of the competitive market network is the resource network.

The resource-based view (Barney, 1991; Conner & Prahalad, 1996; Peteraf, 1993) argues that firms are different in terms of their unique resources bundles. These varied strategic or resource endowments not only determine the firm's competitive advantage (Conner & Prahalad, 1996; Rumelt, 1984), but also constrains its strategic choices (Collis, 1991; Teece, Pisano, & Shuen, 1997). The conceptual link between market commonality and resource similarity not only exists between a given dyad or pair of competitors (Chen, 1996) but also, I argue, exists at the network level. In the industry system, each firm occupies a unique position in a competitive market network and resource network. The external market contacts and internal resource endowment will collectively influence the firm's competitive behavior and ultimately its organizational performance.

I first propose my theoretical conceptualization of a competitive network in terms of multimarket contacts and resource homogeneity. Next, based on my conceptual model, I hypothesize the effects of a firm's market position and resource position in a competitive network on its competitive behavior, and ultimately on its organizational performance. In the following methodology section, I illustrate the measurement of the constructs by using the data from U.S. scheduled airlines during the period 1998 to 2000. This paper ends with my research findings and implications for research and practice.

COMPETITIVE NETWORK

Firms are collectively dependent upon one another for success (Porter, 1980; Scherer & Ross, 1990); the concept of a competitive network will help researchers to capture this interdependence at the network level. From an embeddedness perspective (Baum & Dutton, 1996; Dacin, et al., 1999; Granovetter, 1985), firms are embedded in a network of connections. Cooperative linkages constitute positive connections; in contrast, firms that are competing against each other are negatively connected. A competitive network is composed of competitive linkages among firms, which in turn are composed of multimarket contacts and resources similarities. A firm's market position and resource position in the competitive network are two building blocks of competitor analysis at the industry level.

Market Position

An industry is composed of many markets in which firms are competing against multiple rivals. Multipoint competition is an appropriate illustration of a competitive network. Shared market implies the mutual dependence of firms. Within the industry, firms' competitive contacts in multiple markets form a competitive network. In many industries, a firm is simultaneously competing against two or more competitors; therefore, competitor analysis should not remain at the dyadic level, but rather should expand to the whole industry. To capture the competitive asymmetry (Chen, 1996) at the network level, I will study the competitive network of shared markets.

Recent research explores the effect of cooperative networks on competitive behavior (Gnyawali & Madhavan, 2001; Madhavan, et al., 2004). The communication literature states that information spreads irregularly through a system, arriving at different locations at different times. In a cooperative network, the structural properties of firms and the structure of the network influence the flow of assets, information, and status among network members. In a competitive network, the structural properties of firms will influence information flow among competitors because variations in market position in the industry produce differences in the communication of market signals. Most signals carry information that can aid in competitive analysis and strategy formulation. Firms with more multimarket contacts will gather more information and knowledge about one another's competitive intent, strategies, tactics, and resources. This differential information flow will affect firms' awareness of competitors' activities as well as their motivation and ability to attack their rivals or to respond to actions of others. Theoretically, a firm's market position in the competitive network will influence its competitive behavior.

Multimarket contact measures the average number of markets in which a firm competes with its rivals in a given market, excluding the focal market (e.g. Gimeno & Woo, 1996a). A firm's structural properties in a competitive network will measure the multimarket competition in the whole industry. Competitive linkages are constructed based on the multimarket contacts of the firms.

Resource Position

The resource-based view holds that firms differ in terms of strategic or resource endowment. Each firm is a unique bundle of tangible and intangible resources and capabilities (Penrose, 1959; Wernerfelt, 1984). Firms acquire resources and capabilities over time and manage them through different routines (Barney, 1991; Peteraf, 1993; Teece, et al., 1997). Within an industry, a firm's unique resources bundle will determine its competitive advantage (Conner & Prahalad, 1996; Rumelt, 1984). Meanwhile, resource endowment may constrain a firm's strategic choices (Collis, 1991; Teece, et al., 1997). The extent to which a focal firm possesses resource endowment comparable to that of its competitors in the whole industry will influence its capability for competitive behavior.

The previous literature diverges as to the effects of resources homogeneity on the level of rivalry. On the one hand, the resource-based view suggests that firms with similar resources are more likely to pursue the same strategy and to have no unique resources or isolating mechanisms to create a sustainable advantage (Barney, 1991). They are more likely to contest each other's market territory; therefore, rivalry will be intense when firms have homogeneous resources. On the other hand, strategic group theory and industrial organization economic explanations of firms (Cool & Djerickx, 1993; Peteraf, 1993; Porter, 1979) argue that

the level of rivalry will be greater between firms with heterogeneous resources than between those with similar resources. I will elaborate on these arguments in the section on hypotheses development.

Network Competitor Analysis

I define a competitive network as a system of competitive linkages based on both multimarket contacts and resource homogeneity. Network competitor analysis investigates a firm's position in the market network and resource network. Market position captures the extent to which a firm shares common markets with its competitors in a competitive network; resource position captures the extent to which a firm possesses similar resources with its competitors in a competitive network. Each firm occupies a unique position in the competitive network in terms of multimarket contacts and resource homogeneity and differs from its rivals in degree along a continuum of market position and resource position. Network competitor analysis refers to the simultaneous analysis of multiple competing firms in a competitive network.

At the dyadic level, there is a conceptual link between market commonality and resource similarity between a given pair of competitors (Chen, 1996). At the network level, I argue a conceptual link exists between market position and resource position of a given firm in a competitive network. A firm's structural properties in the competitive market network and resource network will result in differences in flow of information among the competing actors. This information flow in multiple competitive markets determines a firm's awareness of competitive linkages and action implications and its motivation to act. Simultaneously, the information flow in the resource network determines a firm's ability to attack rivals or to respond to others' actions. These three behavioral antecedents - awareness, motivation and capability - essentially drive the actors' competitive behavior (Dutton & Jackson, 1987; Kiesler & Sproull, 1982; Lant, Milliken, & Batra, 1992; Schelling, 1960).

From the network perspective, I will analyze a firm's competitive position in the industry system. Researchers can use multilevel analysis to study a competitive network, specifically, at the firm level, dyadic level, and network level. Four constructs are identified as the most relevant in explaining the structural embeddedness of competitive behavior: centrality, structural autonomy, structural equivalence and density (Gnyawali & Madhavan, 2001). Among these network constructs, the firm-level structural properties, such as overall firm market position and resource position, and the resulting implications for competitive behavior, are of primary interest to strategy researchers. To explore the effects of a firm's market position and resource position in a competitive network on its competitive behavior, I identified two acknowledged firm-level constructs: centrality and constraint.

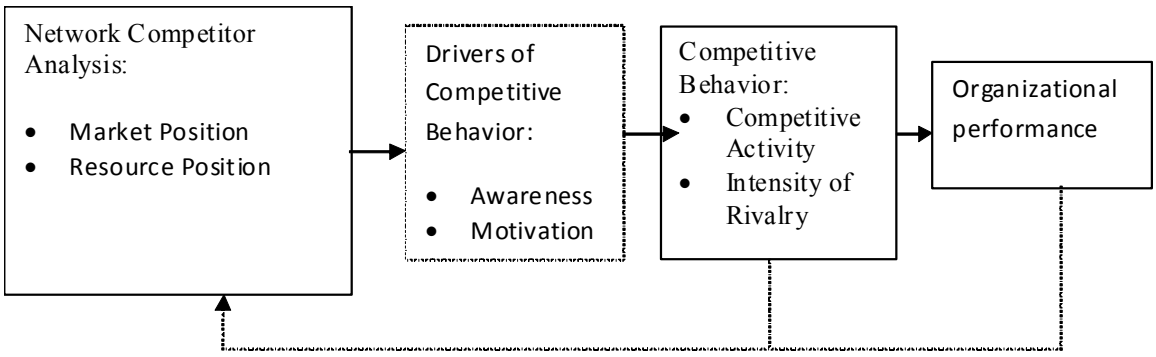
Centrality refers to the position of an individual firm in the business network; it represents the extent to which the focal firm occupies a strategic position in the network (Wasserman & Faust, 1994). Changes in the relative centrality of firms are important indicators of structural changes. Measuring the variation in the firms' levels of centrality may assess the structural changes of the embedded network.

Constraint, in contrast, is a negative measure of a firm's structural autonomy in the network. Structural autonomy is the network feature of actors who have 'relationships free of structural holes at their own end and rich in structural holes at the other end' (Burt, 1992: 45). Constraint, which refers to the lack of structural holes in an actor's network, is an index of how efficient and effective the network is (Burt, 1992). Both structural properties of the focal firm critically influence the information flows among competing firms, and consequently, the awareness of competitive activities and the motivation and abilities of the actors to take

competitive moves. Moreover, among firm-level structural properties, centrality and constraint are the two most studied constructs and have sufficient theoretical and empirical support in the literature (e.g., (Brass & Burkhardt, 1993; Burt, 1992; Wasserman & Faust, 1994). Therefore, I will restrict my scope to the centrality and constraint of a firm in a competitive network.

Figure 1 offers a schematic presentation of my conceptual model. A firm's structural properties in a competitive network - market position and resource position - influence the drivers of competitive behavior (awareness, motivation, and capability). Subsequently, these drivers influence the probability of a firm's competitive behavior measured by its competitive activity and the intensity of rivalry. Next, organizational performance is affected by the firm's competitive behavior. The feedback loop in the model suggests that a firm's performance and competitive behavior will ultimately alter its structural properties in the competitive network. In this paper, I will empirically test the effects indicated by the solid lines in the model.

Figure 1
A Conceptual Model of Network Competitor Analysis, Competitive Behavior and Organizational Performance



HYPOTHESIS DEVELOPMENT

Based on my concept of competitive network and network competitor analysis, I will hypothesize the effects of a firm's market position and resource position on its competitive behavior and organizational performance. My arguments are based on three drivers of competitive behavior: awareness, motivation and capability (Chen, 1996). In a competitive network, the structural properties of firms will influence the information flow among competitors because variations in market position in the industry result in differences in communication of market signals. Most signals carry information that can aid in competitive analysis and strategy formulation. Firms with more multimarket contacts will gather more information and knowledge about one another's competitive intent, strategies, tactics, and resources. This differential information flow will affect the firms' awareness, motivation, and ability to attack their rivals or to respond to actions of others. Therefore, a firm's market positions in the competitive network will influence its competitive behavior, which

includes actions and responses. An action is a specific competitive move, such as a price cut or a new product introduction, initiated by a firm to defend or improve its relative competitive position (Chen, Smith, & Grimm, 1992), whereas a reaction is a discernible counteraction taken by the competitors that is designed to defend or improve its relative position. To capture a firm's competitive behavior, I measure the number of competitive activities the firm conducted and the intensity of rivalry it experienced.

The mutual forbearance hypothesis (Edwards, 1955) in multipoint competition research argues that the mutual dependence between firms interacting in multiple markets will make them less likely to compete aggressively in the common markets (e.g. (Barnett, 1993; Gimeno, 1999; Gimeno & Woo, 1996a, 1996b; Young, et al., 2000). Competitors recognize the effects of their actions on each other, and are compelled to respond to their rivals' moves with countermoves of their own (Chen, 1996; Chen & Macmillan, 1992; Chen & Miller, 1994). As oligopoly and game theory suggest, a firm can use strategic deterrence and threats of retaliation to influence the motivation of a rival so as to erode its position (Chen & Miller, 1994; Schelling, 1960; Tirole, 1990). Although it is increasingly difficult for firms to sustain valuable market positions over time, imitators or rivals may lack the ability to erode a firm's market position. Sustainability of competitive advantage may also be due to a lack of motivation to attack on the part of would-be imitators or rivals (Gimeno, 1999).

In a competitive network, a central firm is competing against more firms in the common markets than a peripheral actor is. A central actor has greater access to information of the competing firms and the whole industry system. This information asymmetry implies how much more motivated and capable the firm is to conduct competitive activities. A firm may use strategic deterrence and threats of retaliation to influence the motivation of a rival to erode its position. In the competitive network, a central firm is more likely and better able to reduce its rivals' motivation and capability to attack, thereby decreasing the peripheral actors' competitive activities. Meanwhile, since the central firm has more competitive linkages in the whole market network, it will experience more intense rivalry, and the competitive activities the central firm conducts will also increase the intensity of rivalry. In contrast, a peripheral firm, which occupies a niche market, is less likely to initiate competitive actions and experience less intense rivalry.

Hypothesis 1a: All else being equal, the more central a firm's market position in the competitive network, the greater will be its competitive activity.

Hypothesis 1b: All else being equal, the more central a firm's market position in the competitive network, the greater the intensity of rivalry it will experience.

From Burt's (1992) work on structural holes, constraint can be seen as another key structural property of an actor in the network. It measures the extent to which an actor does not enjoy structural holes between its alters. If actor A has ties to both B and C but B and C are not tied directly to each other, a structural hole exists between B and C. The absence of a structural hole between B and C poses a constraint on A. In a competitive network, the linkages between actors are negative. The competitive connection between B and C can take part of their attention from actor A; therefore, they are less aware of actor A's competitive behavior and less motivated to compete with A. Actor A can actually take advantage of the competitive connection between B and C. Under this circumstance, a firm can conduct more competitive activities without drawing

its direct competitors' rivalry responses. Consequently, the firm will experience less intensity of rivalry even though it takes more actions.

Hypothesis 2a: All else being equal, the more structurally constrained a firm's market position in the competitive network, the more competitive activities it will conduct.

Hypothesis 2b: All else being equal, the more structurally constrained a firm's market position in the competitive network, the less the intensity of rivalry it will experience.

Competitive linkages exist not only in shared markets, but also in resource endowment. A firm's capability to initiate actions and to respond to others is conditioned by its position in the resource network. Network competitor analysis investigates a firm's position in the market network and in the resource network. A central position in the resource network implies resource endowment similar to that of a majority of firms in the industry. A central firm and its direct competitors possess more homogeneous resources than a peripheral firm and its competitors do.

According to strategic group theory and industrial organization economic explanations of firms (Cool & Djerickx, 1993; Peteraf, 1993; Porter, 1979), the level of rivalry will be greater between firms with similar resources than between those with heterogeneous resources. Firms with similar resources are more likely to generate homogeneous strategies and goals that may serve as very similar sources of distinctive competencies; therefore, firms have scant opportunity to gain competitive advantage by differentiation. Under these circumstances, to maintain profitability, firms will coordinate their actions tacitly (Scherer & Ross, 1990). Meanwhile, similar resource endowment of the members of the same groups will lead them to behave competitively in similar ways. Firms will be better able to recognize their mutual dependence and cooperate, or tacitly collude, with one another (Caves & Porter, 1977; Peteraf, 1993; Porter, 1979). In contrast, firms with heterogeneous resources are better able to generate varying strategies and gain a competitive advantage by differentiation. Their rivals will have more difficulty in predicting and coordinating actions with these firms (Porter, 1980; Scherer & Ross, 1990). The above arguments suggest that the level of rivalry will be greater between firms with heterogeneous resources than between those with similar resources.

However, according to the resource-based view of the firm (Barney, 1991; Peteraf, 1993), to sustain its competitive advantage, a firm must utilize its heterogeneous asset bases (Rumelt, 1984) to prevent competitive imitation (Collis, 1991). When firms have homogeneous resources, they are more likely to pursue the same strategy and to have no unique resources or isolating mechanisms (Rumelt, 1984) to create a sustainable advantage. Therefore, they are more likely to contest each other's market territory. Rivalry will be more intense when firms have homogeneous resources. An implicit assumption of the resource-based view is that resource homogeneity is a competitive linkage between firms; therefore, my hypotheses are based on this theoretical perspective. In a competitive network, a firm's resource endowment significantly circumscribes its ability to attack its rivals and respond to others' competitive behavior. Firms may differ in their ability to draw advantage from the key firm-specific resources. Moreover, occupying a vital position in the information flow, a firm with high resource centrality may be better able to utilize its resources to attack and respond to others. At the same time, a central firm will experience a higher level of rivalry because other firms with homogeneous resources are capable of retaliating. In contrast, a peripheral position in the resource

network means more unique resources that give the firm a niche advantage, so that it will be less likely to attack competitors and will experience less rivalry.

Hypothesis 3a: All else being equal, the more central a firm's resource position in the competitive network, the greater will be its competitive activity.

Hypothesis 3b: All else being equal, the more central a firm's resource position in the competitive network, the greater the intensity of rivalry it will experience.

Constraint is also a structural property of the resource network. However, resource constraint is a weaker predictor than market constraint is, because although resource similarity implies a competitive connection through the resource-based view, it also predicts potential cooperation between firms. Following logic analogous to that used with the market constraint, I hypothesize that in a competitive network, a firm's resource constraint results in more competitive activities and less intensity of rivalry. The firm can conduct more competitive activities without drawing its direct competitors' retaliation because the competitors themselves are competing against each other. Since this competition requires resources investment, the competitors have less available resources to retaliate against the focal firm. Consequently, because of less retaliation, the firm will experience less intensity of rivalry even though it takes more actions.

Hypothesis 4a: All else being equal, the more structurally constrained a firm's resource position in the competitive network, the more competitive activities it will conduct.

Hypothesis 4b: All else being equal, the more structurally constrained a firm's resource position in the competitive network, the less intensity of rivalry it will experience.

The competitive dynamics stream of strategic management research has established a link between inter-firm rivalry and organizational performance (Chen, 1996; Young, 1996). Aggressive competitive behavior is related to better organizational performance. Repeated competitive interaction provides an opportunity for sustainability, since the firm can reduce the rival's motivation to attack, even among rivals with the ability to erode it. At the same time, a firm can achieve better performance if it experiences less intense rivalry.

Hypothesis 5a: All else being equal, the more competitive activities a firm conducts, the better its organizational performance.

Hypothesis 5b: All else being equal, the more intense rivalry a firm experiences, the worse its organizational performance.

RESEARCH METHODS

Sample

I selected the U.S. Domestic airline industry because of its intense competitiveness, well-known competitors, clearly defined boundary, and availability of public information. The U.S. airline industry provides an ideal context for studying competitive interaction in general (Chen & Macmillan, 1992; Chen & Miller, 1994; Chen, et al., 1992; Miller & Chen, 1994) and multipoint competition in particular (Baum & Korn, 1996; Chen, 1996; Evans & Kessides, 1994; Gimeno & Woo, 1996b; Smith & Wilson, 1995) and is ideal for a study of a competitive network. First, detailed data are collected by the Department of Transportation (DOT) from all carriers. The DOT database used in this study was the Form 41 reports. I also obtained data from DOT publications: Air Carrier Financial Statistics, and Air Carrier Traffic Statistics. Second, the airline industry is made up of discrete city-pair markets with little or no cross-elasticity of demand. City-pair markets are defined as 'the set of customers demanding air travel between a given pair of cities, irrespectively of how that demand is satisfied in terms of the trip structure' (Gimeno, 1999: 110). I constructed the competitive network based on more than 7000 city-pair markets. Finally, air transportation was the primary business of almost all of the airlines, which controls for the effects of diversification and multimarket contact outside the industry. Data from all U.S. scheduled passenger airlines operating over the period of 1998 to 2000 (three years) were collected and processed to test the hypotheses. While my initial sample was all U.S. scheduled passenger airlines, because of data limitations my final sample included the 22 largest public airlines for 62 firm-years.

Constructs Operationalization

Competitive Network Measures

Market Network. From DOT's T-100 domestic segment data, I constructed a 58-by-58 relational matrix of competitive links between carriers for each year from 1998 through 2000. This sample period is appropriate for my study, because no dramatic evolution occured in the U.S. airline industry during that time, which helps to control the macro-environmental influence. I selected nonstop and one-stop services for city-pairs, because both services are considered substitutes for each other in the airline competition literature. The air routes data was sorted and processed by computer programs. In this process, I eliminated the city-pair market in which only cargo airplanes operate, because only scheduled passenger services are relevant to my final sample. Meanwhile, I considered only city-pair markets in which both end-cities were at least small hubs, according to the Federal Aviation Administration (FAA) classification, which means that the enplanements in each airport were at least 0.05 percent of the total yearly U.S. enplanements. I generated 7,871 valid routes for 1998, 7,970 for 1999, and 8,879 for 2000.

To construct the carrier-by-carrier square matrix, I first counted the number of common markets two carriers shared. If carrier A and carrier B both operated on a route for that year, they shared one city-pair market. The total number of shared common markets were input into each cell of the square matrix, that is, the number in each cell indicates the total number of common markets of a given pair of carriers. Assisted

by computer programs, I generated one square matrix for each year: a 58-by-58 matrix for 1998, a 60-by-60 for 1999, and a 58-by-58 for 2000.

Market Centrality. I used the network analysis software UCINET 6 (Borgatti, Everett, & Freeman, 2002) to measure the structural properties of each carrier in the competitive network. To measure the extent of central position in the competitive market network, I used degree centrality as the measure of Market Centrality. The number of vertices adjacent to a given vertex in a symmetric graph is the degree of that vertex. Degree centrality, which measures network activity (Freeman, 1979), is appropriate for my study because it indicates the total number of other firms with which the focal firm competes within the industry.

Market Constraint. Constraint is operationalized in the manner described by Burt (1992: 55), and reproduced below:

$$(p_{ij} + \sum_{q} p_{iq} p_{qj})^2, q \neq j$$

where p_{ij} is the proportional strength of i's relationship with j,
p_{iq} is the proportional strength of i's relationship with q, and
p_{qj} is the proportional strength of q's relationship with j.

Resource Network. Aircraft are a vital strategic endowment in the air transportation industry (Chen, 1996). The resource network was constructed by using the fleet data collected from Moody's Transportation Manual, 1999-2001, which reports most carriers' data for the previous year. I identified 35, 37, and 39 major aircraft types for 1998, 1999, and 2000, respectively. Resource similarity, or the extent to which two carriers share comparable strategic endowments, was measured by using a formula in which each competitor's resource similarity to that of a focal firm was developed from a detailed type-by-type analysis across all the aircraft they had in common:

$$R_{ab} = \sum_{i=1}^{aircraft\_types} [(P_{ai} / P_a) \times (P_{bi} / P_i)]$$

where R_{ab} Resource commonality that airline b has with the focal airline a;
P_{ai} Number of aircraft owned by a of type i;
P_a Number of aircrafts owned by a of all types;
P_{bi} Number of aircraft owned by b of type i;
P_b Number of aircrafts owned by b of all types; and
i A type of aircraft used by both a and b.

Assisted by computer programs, I generated one square matrix for each year: a 35-by-35 matrix for 1998, a 37-by-37 for 1999, and a 39-by-39 for 2000. The number in each cell of the square matrix indicates the extent to which two carriers share homogeneous resources.

Resource Centrality and Resource Constraint. Following the procedure similar to that used for market network measures, I used UCINET 6 to calculate the structural properties of each carrier in the resource network.

Competitive Behavior Measures

Competitive Activity. A firm-level database was prepared based on the review of competitive actions of all the carriers as reported in a public journal. I identified the competitive activities of every U.S. scheduled passenger airline from a three-year review of each issue of Aviation Daily, a 50-year-old industry publication which other publications use as a source of information. Competitive actions are considered significant and important only if they were publicized in this journal, a method that has been adopted elsewhere (Chen, et al., 1992; Smith, Grimm, Gannon, & Chen, 1991; Smith, Grimm, Wally, & Young, 1997; Young, et al., 2000). Competitive activity was operationalized as the number of competitive actions undertaken by a firm during the time period under consideration.

Competitive Activity for firm i = count (N_i)
where N_i refers to the total number of actions firm i undertook in a given year.

Intensity of rivalry. Consistent with previous research (Gimeno, 1999), I used domestic yield to measure the intensity of rivalry the carrier experienced. The outcome of inter-firm rivalry is commonly reflected in decreased prices for the services provided by a firm. In the airline industry, price competition is the main dimension of competition; therefore, I used a measure of price known in the industry as yield to capture lack of rivalry. Yield was defined as passenger revenue per revenue-passenger-mile, or the total price paid by customers divided by the total passenger-miles, stated in cents per mile. Higher yields reflect less intense rivalry. Since my study focuses on the domestic competitive market, I calculated Domestic Yield using domestic passenger revenue data obtained from the Air Carrier Financial Statistics 1998-2000 and domestic revenue-passenger-miles obtained from the Air Carrier Traffic Statistics 1998-2000.

$$DomesticYield_{it} = \frac{DomesticPassengerRevenue_{it}}{DomesticRevenue-passenger-miles_{it}}$$

Organizational Performance. I used profitability to measure organizational performance of each carrier. Profitability represents the ability of a firm to obtain revenues above costs. I used the variables yield (price per revenue-passenger-mile) and cost per revenue-passenger-mile to construct the Lerner index, a popular measure of economic performance used in industrial economics, which is defined as the price-cost margin divided by the price. I calculated the Lerner index for each airline route as:

$$LernerProfitability_{it} = \frac{DomesticYield_{it} - DomesticCost\_per\_revenue-passenger-mile_{it}}{DomesticYield_{it}}$$

Control Variables

I used three control variables: size, age, and generic strategy. To measure Size, I used an indicator variable set to 1 for regional airlines and 0 for the major airlines, as defined by DOT. My measure of Age, the number of years of operation for the airlines, was developed from the FAA database on airline certificate issue date. Finally, following Smith et al. (1997), I used an indicator variable for Generic Strategy that was set to 1 for low cost airlines.

Data Analysis

My model suggests a more complex relationship than can be modeled using multiple regression models. Therefore, I ran a three-stage least squares (3SLS) analysis to test the complete model at one time (Greene 2000: 692-3). The equations tested are shown below:

Performance: Lerner Profitability = B0 + B1(Competitive Activity) + B2(Domestic Yield) + Error Term

Competitive Behavior: Competitive Activity = B0 + B1(Control: Size) + B2(Control: Age) + B3(Control: Generic Strategy) + B4(Market Constraint) + B5(Market Centrality) + B6(Resource Constraint) + B5(Resource Centrality) + Error Term

Competitive Behavior: Domestic Yield = B0 + B1(Control: Size) + B2(Control: Age) + B3(Control: Generic Strategy) + B4(Market Constraint) + B5(Market Centrality) + B6(Resource Constraint) + B5(Resource Centrality) + Error Term

RESULTS

The correlation matrix is shown in Table 1. My control variables are significantly correlated with my two measures of competitive behavior, competitive activity and domestic yield. The correlation table also indicates that my measures of competitive behavior (competitive activity and domestic yield) are negatively correlated. This negative correlation indicates that my proxy for rivalry intensity (domestic yield) is low when the number of competitive actions is high, which is as expected. The correlations for the competitive network position variables (market constraint, market centrality, resource constraint, and resource centrality) are such that the centrality measures are negatively correlated with the centrality measures, again as expected.

Table 2 contains the results of the structural model tested using 3SLS regressions. The model shows the relationship of competitive behavior (competitive actions and rivalry intensity as measured by domestic yield) on performance (Lerner profitability) after accounting for three control measures (Size, Age, and Generic Strategy) and competitive network position (market centrality, market constraint, resource centrality, and resource constraint). The three separate regressions of the structural model (DV:Lerner Profitability, DV: Competitive Activity, and DV: Domestic Yield) are each statistically significant.

In the first regression of the structural model, Domestic Yield is positively associated with Profitability, supporting Hypothesis 5b. Competitive Activity, however, was not significant, which does not support Hypothesis 5a.

In the second regression of the structural model (DV: Competitive Activity), hypotheses 1a and 3a are both supported, while hypothesis 2a and 4a are not. As Market Centrality and Resource Centrality increase, Competitive Activity increases.

Hypothesis 2b is supported in the third regression (DV: Domestic Yield). However, hypotheses 1b, 3b, and 4b were not. As Market Constraint increases, Domestic Yield increases.

Table 1: Correlations and Descriptive Statistics

Variables	Mean	s.d.	1	2	3	4	5	6	7	8	9
Performance											
1. Lerner Profitability	-0.02	0.12									
Control											
2. Size	0.46	0.5	.17**								
3. Age	25.85	19.46	-.28***	-.48***							
4. Generic Strategy	0.15	0.36	.18**	.45***	-0.18						
Competitive Behavior											
5. Competitive Activity	48.85	51.52	-0.01	-.64***	.38***	-.31***					
6. Domestic Yield	0.16	0.05	.17**	.51***	-.26**	.74***	-.27***				
Competitive Network Position											
7. Market Centrality	0.03	0.03	-0.05	-.80***	.44***	-.34***	.92***	-0.15			
8. Market Constraint	0.28	0.03	.27**	.53***	-.43***	.55***	-.58***	.34***	-.62***		
9. Resource Centrality	0.43	0.04	-0.05	-.70***	.40***	-.30***	.92***	-.24***	-.62***	.94***	
10. Resource Constraint	0.49	0.24	-.10*	0.01	-0.1	-0.03	-.27**	-.28**	0.01	-.25**	-.17**

* $p < 0.05$
** $p < 0.01$
*** $p < 0.001$ Correlations based on two-tail tests of significance

Overall, I find strong support for the hypothesis that a firm's structural properties in a competitive network are related to the firm's competitive behavior, and some support for the hypothesis that competitive behavior is related to a firm's organizational performance. Although some competitive network properties were more important for some measures of competitive behavior than for others, overall my results support my conceptual model.

Table 2
3-Stage Least Squares Regression Models

Variable	Coefficient	Z	Hypothesized Sign
DV: Lerner Profitability Chi2=4.64 *			
Intercept	-0.15	-2.35 **	
Competitive Activity	0	0.46	H5a (+)
Domestic Yield	0.77	2.14 *	H5b (+)
DV: Competitive Activity Chi2=510.24*** psuedo-R^2 =0.89			
Intercept	-27.01	-0.74	
Size	19.82	2.29 *	Control Variable
Age	0.05	0.42	Control Variable
Generic Strategy	-9.35	-1.21	Control Variable
Market Centrality	789.95	3.57 ***	H1a(+)
Market Constraint	58.2	0.53	H2a(+)
Resource Centrality	549.16	3.81 ***	H3a(+)
Resource Constraint	-8.87	-0.84	H4a(+)
DV: Domestic Yield Chi2=107.46*** psuedo-R^2 =0.63			
Intercept	-0.08	-0.12	
Size	0.04	2.44 **	Control Variable
Age	0	-0.77	Control Variable
Generic Strategy	0.08	5.56 ***	Control Variable
Market Centrality	0.17	0.4	H1b(-)
Market Constraint	0.41	1.95 *	H2b(+)
Resource Centrality	0.26	0.94	H3b(-)
Resource Constraint	-0.02	-1.04	H4b(+)

† $p < 0.10$
* $p < 0.05$
** $p < 0.01$

DISCUSSION

The central research question I sought to investigate in this study was how a firm's structural positions in a competitive network affect its competitive behavior and ultimately its organizational performance. My findings indicate that both market position and resource position of a firm affect its competitive activity, while only market position impacts the intensity of rivalry it experiences. Furthermore, I found that while the intensity of rivalry impacted firm performance, competitive activity was not a significant predictor of performance. My findings, at the network level, are consistent with Chen's (1996) argument, made at the dyadic level, that market commonality would be a stronger predictor of competitive behavior than resource similarity.

This research supports the proposition that competitor analysis should not remain only at the dyadic level, but should consider the whole competitive system or competitor network. The intensity of the rivalry facing a firm and the number of actions taken by a firm have been shown to be related to the firm's position in the competitor network.

The findings from this paper also provide a possible insight regarding the debate between the strategic group literature and the resource-based view. Although the resource network was found to be related to the level of competitive activity undertaken by a firm, the resource network was not found to have an impact on the intensity of rivalry. While my measurement of resources in this industry is admittedly limited, this finding would suggest that firms with more homogenous resources are more likely to be active competitively. This supports the resource-based view perspective and is counter to the arguments put forward in the strategic groups literature.

Finally, this paper supports the network perspective. While previous studies have linked cooperative networks to firm performance and actions, I have demonstrated that competitive networks can also be linked to firm performance and actions. Thus, the development of the network perspective should incorporate both cooperative and competitive networks.

Limitations

Although this study sheds some light on the relationships between competitive network position, competitive behavior, and organizational performance, it has certain limitations. The current study has examined the case of the U.S. domestic scheduled passenger airline industry. While this approach is useful, future studies should examine the generalizability of these findings to other industries and other geographic regions. Future research should also consider more fine-grained analysis of firms' actual competitive activity. For example, actions and responses could be identified, as well as specific categories of actions, that may yield additional insights. As others have indicated, the operationalization of the resource-based view faces many challenges. In this study, I have followed previous researchers and focused upon aircraft type. Future studies may wish to define and explore other operationalizations of resources. Key resources may underlie the competitive advantage of the firm in multiple markets for multiproduct or multimarket firms. Finally, I would suggest that future research should consider the multi-levels of competition. For example, research may consider how dyadic competition interplays with network-level competition.

CONCLUSION

This study will contribute to an integrated understanding of the embeddedness perspective, multipoint competition, and resource-based view. This research contributes to my understanding by considering the larger picture of competitor analysis through examining a network rather than a dyadic relationship. For managers, this approach indicates the importance of considering the relationship between sets of competitors. I would suggest that competitor analysis should be further developed to include the system or network of competitors. Thus, managers need to consider not just their direct competitors, but also key competitors in their system-wide market and resource networks.

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WHITE VS. BLUE: DOES THE COLLAR COLOR AFFECT JOB ATTITUDES AND BEHAVIORS?

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ABSTRACT

The purpose of the present study was to fill a void in the literature by examining a variety of attitudinal and behavioral issues in a sample of white and blue-collar workers. An older body of literature exists which examined the relationship between job size and satisfaction (see review by Hulin & Blood, 1968). However, very few recent studies have focused on the attitudinal and behavioral differences between white and blue-collar workers. Therefore, the purpose of the current research study was to investigate these differences. Specifically, we used the Chow test to compare the equality of a series of regression equations which had evaluated the statistical relationships between variables such as dispositional affectivity, job satisfaction, organizational commitment, turnover intentions, and absenteeism, and tardiness. We examined these models using a sample of 594 employees of a Midwestern manufacturing company. We conclude with a discussion of the results and their implications for management research and practice.

INTRODUCTION

Researchers continue to be curious about the role of job attitudes and behaviors as they relate to a variety of workplace variables. Specifically, past empirical studies have investigated a variety of work attitudes related to dispositional affectivity, with most studies examining a few workplace attitudinal variables within a study. In the current study, we investigate the impact of dispositional affectivity on a wide spectrum of workplace attitudes and behaviors using a sample of white and blue collar workers. Much of the research in the area of dispositional affectivity has largely focused on negative affectivity (Fredrickson & Losada, 2005; Hochwarter et al, 2003). As such, researchers have criticized the exclusive focus on the negative affectivity construct (Fortunato & Stone-Romero, 1999; Stone-Romero, 2005). The positive psychology movement, first advocated by Seligman (2000), has shifted the focus to positive affectivity and its advantage for promoting a healthy organizational environment. Hence, there has been a shift in the literature on dispositional affectivity to a greater emphasis on evaluating positive affect and its statistical relationships with a variety of variables. This paper looks at both positive and negative affect and their impact on a range of job attitudes and behaviors.

In most research regarding workplace attitudes and behaviors, research is conducted with employee samples without regard to the 'type of job'. The assumption seems to be one that holds that workers are workers. Thus, factors that may affect one group will logically affect another group. However, what if this assumption fails to hold true? What if there are differences in attitudes and behaviors that exist independent of one's workplace environment? It seems logical to assume that individuals enter the workplace with certain

predispositions that have been formed as a result of their experiences and perhaps genetics. Further, it seems logical to assume that an element of self-selection exists in the workplace, with certain individuals possessing specific predispositions selecting careers that match these predispositions. Thus, this research fills a void in the literature pertaining to differences in white and blue collar workers. Indeed, little, if any recent research has examined the attitudinal and behavioral differences between white and blue-collar workers. Therefore, another purpose of the current research study was to investigate these differences.

We begin by reviewing the pertinent literature for dispositional affectivity and each of the individual difference variables. Next, we consider the conceptual linkages between these variables, as well as their effects on work-related attitudes and behaviors such as job satisfaction, organizational commitment, turnover intentions, absenteeism, and tardiness. Drawing on this discussion, we use regression analysis comparing the white and blue-collar samples to test a set of hypotheses regarding the relationships between dispositional affectivity and certain work attitudes and behaviors. We examine these models using a powerful sample of 595 employees (an 85% response rate) of a Midwestern manufacturing company. We conclude with a discussion of the results and their implications for management research and practice.

LITERATURE REVIEW

Dispositional Affectivity and Work-Related Attitudes and Behaviors

Social scientists have long been intrigued by individual differences in people's interpretations of their own emotional experiences (Berry & Hansen, 1996). In particular, research shows that some individuals report experiencing increased amounts of positive emotions relative to others. The phenomenon is referred to as positive affect, and these persons are usually self-described as joyful, exhilarated, excited, and enthusiastic. Those low in PA have been described as listless, lethargic, drowsy, apathetic, and dull (Cropanzano et al, 1993; Watson & Tellegen, 1985). In contrast, other individuals describe themselves as experiencing greater amounts of negative feelings than others, and are often referred to as high-negative-affect individuals (Berry & Hansen, 1996; Cropanzano et al., 1993). Such individuals report being afraid, anxious, angry, and tend to be nervous and tense. Those low in NA tend to view conditions as less upsetting and stressful than high NA individuals (Chiu & Francesco, 2003). Interestingly, the research on dispositional affectivity has shown that there are two general dimensions of affective responding: trait-positive affect (PA) and trait-negative affect (NA). These dimensions do not appear to represent opposite ends of a continuum; but rather they are independent of one another (Berry & Hansen, 1996; Diener & Emmons, 1985). That is, it is possible for an individual to be high on both, low on both, or high on one but not the other (George, 1992; Watson & Tellegen, 1985). An individual who rates high on both dimensions would be characterized as quite emotional, and would experience fluctuating moods in response to environmental stimuli (Diener & Emmons, 1985). In sharp contrast is the individual that rates low on both who would likely display little affect; i.e. the person would likely be unemotional and unresponsive (Cropanzano et al., 1993).

Several researchers have documented the significant relationship between dispositional affectivity and work attitudes. For example, an inverse relationship has been found to exist between NA and job satisfaction ENRfu(Levin & Stokes, 1989; Staw, Bell, & Clausen, 1986). A minority of researchers has criticized negative affectivity as a construct (Stone-Romero, 2005) citing construct validity problems, however, several others have shown success in using an established and validated scale (Watson et al., 1988;

Watson, Clark, & Carey, 1988; Watson 1988a, 1988b). Researchers have documented that NA may be negatively correlated with not only job satisfaction, but also organizational commitment, and positively correlated with turnover intentions; the exact opposite pattern of correlations has been obtained for PA ENRfu(Cropanzano et al., 1993). One explanation for these relationships is that work attitudes are primarily a function of how an individual affectively responds to his or her work environment, and are therefore influenced by one's underlying affective disposition. Consequently, high PA individuals are likely to exhibit extremely positive responses to their work environment which are reflected in their work attitudes, while extreme negative responses are usually seen in high NA persons ENRfu(George, 1992).

Research notes the tendency of individuals to be dispositionaly inclined to form positive or negative attitudes about their work (Cropanzano et al., 1993). Interestingly, Arvey, Bouchard, Segal, and Abramson (1989) demonstrated that approximately 30% of the observed variance in general job satisfaction was attributable to genetic factors. Longitudinal studies indicate that scores on job satisfaction measures remain correlated over time, and that this relationship holds even when individuals change employers or occupations (Staw et al., 1986; Staw & Ross, 1985). These findings do not mean that work attitudes are entirely stable, or that the job context is unimportant; in actuality, work attitudes do indeed fluctuate over time. Instead, these longitudinal studies are consistent with the view that while work attitudes vary as a function of changes in the work setting (Cropanzano & James, 1990; Newton & Keenan, 1991), the rank ordering of individuals' attitudes remains relatively stable, and that such stability can be attributed to certain underlying personality dispositions (George, 1992) such as positive or negative affectivity (Cropanzano et al., 1993).

Research by Fredrickson (1998, 2001) has proposed a "broaden-and-build" theory of positive affect which contends that individuals who experience positive emotions and generally experience "chronic" positive affectivity are able to adapt and be flexible to workplace changes. Further, it has been proposed that positive affect individuals possess a wider range of thoughts than individuals who experience negative affectivity on a regular basis. Recent empirical support has shown how positive affect influences behavioral responses (Fredrickson & Branigan, 2005), and psychological growth (Fredrickson, Tugade, Waugh & Larkin, 2003). Indeed, Fredrickson and Losada (2005) contend that PA individuals experience a broader range of thoughts that are proactive in nature as opposed to thoughts that are single-mindedly stagnant, which in essence broadens their behavioral repertoire. Based on this reasoning, Fredrickson (2001) hypothesized that positive affectivity may lead to an increase in psychological resources over time.

In a recent study by Fisher (2002), it was found that positive affectivity was predictive of affective commitment and helping behaviors. Interestingly, in the same study, intention to leave was predicted by work attitudes rather than affective reactions. Further, research has indicated that positive affectivity is characteristic of employees that are successful at dealing with organizational stressors (Isen et al, 1987; Fredrickson et al 2003; Fredrickson & Branigan, 2005; Watson, Clark, & Tellegen, 1988). Moreover, in a study by Chiu and Francesco (2003) it was found that dispositional affectivity predicted turnover intentions. Based on the research outlined above, we hypothesized the following:

H1a: Higher positive affect levels will be significantly and positively related to organizational commitment levels for both white and blue collar workers.

H1b: Higher negative affect levels will be significantly and negatively related to organizational commitment levels for both white and blue collar workers.

H2a: Higher positive affect levels will be significantly and negatively related to turnover intention levels for both white and blue collar workers.

H2b: Higher negative affect levels will be significantly and positively related to turnover intention levels for both white and blue collar workers.

Most measures of job satisfaction include questions containing both positively and negatively worded items, for example, "my job makes me content", and "my job is disagreeable" from the Job in General scale by Ironson, Smith, Brannick, Gibson, and Paul (1989). Fisher (2002) contends that items such as these most likely trigger recall of both positive and negative emotions experienced in the workplace. Indeed, Price (2001) notes that PA and NA may impact job satisfaction through selective perception. That is, PA individuals may selectively perceive positive aspects of the job rather than the negative, resulting in greater job satisfaction. Other researchers have confirmed a similar relationship between dispositional affectivity and job satisfaction (Judge, 1993; Agho et al, 1992; Levin & Stokes, 1989; Cropanzano et al, 1993). Hence, we hypothesized the following:

H3a: Higher positive affect levels will be significantly and positively related to job satisfaction levels for both white and blue collar workers.

H3b: Higher negative affect levels will be significantly and negatively related to job satisfaction levels for both white and blue collar workers.

Other workplace behaviors have also been linked to dispositional affectivity. Interestingly, Iverson and Deery (2001) found that high PA individuals were associated with increased tardiness and early departure but decreased absenteeism. These same authors note the lack of empirical research exploring the causes of tardiness and absenteeism. Indeed, most research on these two workplace variables has focused on the Big Five personality traits (Iverson & Deery, 2001). For example, Cooper and Payne (1967) found that extraversion was significantly associated with both tardiness and absenteeism. In a more recent example, Furnham and Miller (1997) found that PA had a positive relationship to absenteeism. With regard to NA, Ferris, Youngblood, and Yates (1985) and Cooper and Payne (1967) both found that anxiety was associated with absenteeism. Based on the research noted above, we hypothesized the following:

H4a: Higher positive affect levels will be significantly and negatively related to levels of absenteeism for both white and blue collar workers.

H4b: Higher negative affect levels will be significantly and positively related to levels of absenteeism for both white and blue collar workers.

H5a: Higher positive affect levels will be significantly and negatively related to levels of tardiness for both white and blue collar workers.

H5b: Higher negative affect levels will be significantly and positively related to levels of tardiness for both white and blue collar workers.

METHODS

It was determined that the sample for this study should be drawn from a firm engaged in manufacturing operations employing both white and blue-collar workers. This firm had approximately 400 employees engaged in blue collar shift-work and 300 white-collar workers. Therefore, the population consisted of 700 hourly employees of a manufacturing firm located in the Midwestern United States. The final sample size resulted in 594 workers.

In the construction of the survey, a variety of standardized instruments were used to measure the variables included in the research model. Descriptions of these measures and the evidence of reliability and validity are provided below.

Positive and negative affect were measured using the Positive and Negative Affect Schedule (PANAS) developed by Watson, Clark, and Tellegen (1988). The PANAS includes a list of 20 mood-relevant adjectives, of which 10 indicate positive (e.g., active, enthusiastic) and 10 indicate negative (e.g., angry, afraid) mood states. Respondents are instructed to "indicate to what extent you generally feel this way, that is, how you feel on the average." Extensive validity evidence is provided by Watson et al. (1988), Watson, Clark, and Carey (1988), and Watson (1988a; 1988b). Alpha coefficients of .86 and .80 for the PA and NA scales, respectively, were obtained in the current study.

A measure of intent to leave developed by O'Reilly, Chatman, and Caldwell (1991) was employed in this study. This scale is composed of four 7-point Likert-type questions: (1) "To what extent would you prefer another more ideal job than the one you now work in?" (2) "To what extent have you thought seriously about changing organizations since beginning to work here?" (3) "How long do you intend to remain with this organization?" (4) "If you have your own way, will you be working for this organization three years from now?" Each employee was asked to respond to these questions. A coefficient alpha of .80 for this scale was obtained in this research.

Tardiness was measured by a single item which read "How frequently do you arrive at least 10 minutes late to work?" A 7 point Likert scale was used ranging from "never" (1) to "very often (7)." Absenteeism was also measured with a single item which read "Not counting holidays, vacation days, hospitalizations and surgeries, how many days of scheduled work did you miss over the past year?"

In a review of the organizational commitment literature, Meyer and Allen (1991) identified affective, continuance, and normative commitment as three distinctive components of commitment. Affective commitment refers to an affective attachment to the organization. Continuance commitment involves a perceived cost of leaving the organization. Normative commitment stems from a perceived obligation to remain with the organization. Based on the Organizational Commitment Questionnaire developed by Mowday et al. (1982), Allen and Meyer (1990) developed and validated separate measures for each component. Given the focus of the current study, we included Allen and Meyer's 8-item Affective Commitment Scale (ACS) as our measure of organizational commitment. Coefficient alphas for the ACS of .87 and .90 were obtained by Allen and Meyer, and in the present study, respectively.

Overall job satisfaction was measured using the 18-item "Job in General" (JIG) scale (Ironson, Smith, Brannick, Gibson, & Paul, 1989) from the revised version of the Job Descriptive Index (JDI) (Smith, Kendall, & Hulin, 1969). Validation evidence for the JIG is provided by Ironson et al. (1989); coefficient alphas for the JIG scale range from .91 to .95. In the present study, an alpha coefficient of .89 was obtained.

Additionally, a single item was used to assess job satisfaction. Subjects were asked to respond to the following question using a 7-point Likert scale: "All in all, how satisfied are you with your current job?"

The administration of the instrument packets was conducted in cooperation with contact members of the targeted organization. Specifically, data collection was designed to reach all employees at the participating manufacturing firm. The method used was a "drop-off" method whereby contact persons in the firm distributed the survey packets to all employees in their work units. Respondents completed the instruments during normal work hours, and returned them directly to the researchers using a pre-addressed and pre-paid postage packet.

Of the survey packets distributed, 594 were completed and returned for a response rate of 85 percent. Table 1 provides a summary of the demographic attributes of the subjects.

Table 1: Demographic Attributes

Gender	**Frequency-Percentage**
Male	272-92.5%
Female	22-7.5%
Skill Level	
High	94-32.9%
Med-High	69-24.1%
Low	65-22.7%
Shipping	27-9.4%
Maintenance	31-10.8%
Education	
Less than High School	46-16.0%
High School	132-46.0%
Some College	79-27.5%
Associates	11-3.8%
Bachelor's	5-1.7%
Graduate	2-.7%
Other	12-4.2%
Marital	
Single	50-17.2%
Married	197-67.9%
Widowed	2-.7%
Divorced	41-14.1%
Average Years Worked in Company	11.3
Average Years Worked in Job	7.2

ANALYSIS

The research plan was designed to first determine whether there were significant relationships between the variables of interest and positive and negative affect levels exhibited by both white and blue collar workers. Second, the research was then focused on whether white and blue collar workers exhibited similar levels of organizational commitment, turnover intentions, job satisfaction, tardiness, absenteeism, positive affect, and negative affect. The third research question was whether the regression equations relating positive and negative affect levels to the dependent variables of interest were fundamentally equal with regard to the statistical relationships.

Since the research was designed to compare the mean levels of organizational commitment, job satisfaction, absenteeism, tardiness, and turnover intentions of workers, regression analysis were used to investigate the relationships between worker type and the outcome variables. A separate regression analysis was performed for each of the outcome variables. Further, we used the Chow test to compare the equality of a series of regression equations which had evaluated the statistical relationships between the variables. The results of all analyses are presented in the results section.

RESULTS

As the results in Table 2 indicate, H1 is supported by the results. Both groups of employees, white and blue collar, show significant univariate relationships between their levels of positive affect, negative affect, and organizational commitment. Positive affect scores are significantly and positively related to levels of organizational commitment. Thus, as positive affect levels rise, levels of organizational commitment also rise. Conversely, as levels of negative affect increase, both groups of workers' organizational commitment levels decline significantly. An examination of the results indicates that positive affect contributed over 20 percent of the explanation of the variation in organizational commitment levels for both blue and white collar workers (R2 > .20).

Table 2: Relationship Between Positive/Negative Affect and the Dependent Variables

	Dependent Variable (R2)	Independent Variable (B)	F-Value	Significance
White Collar	Commit (.21)	Positive (.46)	65.6	< .0001
Blue Collar	Commit (.25)	Positive (.51)	107.8	< .0001
White Collar	Turnover (.09)	Positive (-.31)	18.8	< .0001
Blue Collar	Turnover (.22)	Positive (-.47)	60.3	< .0001
White Collar	Job Satis. (.25)	Positive (.50)	80.0	< .0001
Blue Collar	Job Satis. (.23)	Positive (.48)	94.8	< .0001
White Collar	Absent (-.003)	Positive (.02)	.11	.74
Blue Collar	Absent (-.003)	Positive (.03)	.20	.65
White Collar	Tardy (.03)	Positive (-.17)	7.6	.007
Blue Collar	Tardy (-.003)	Positive (.02)	.1	.71

Table 2: Relationship Between Positive/Negative Affect and the Dependent Variables				
	Dependent Variable (R2)	Independent Variable (B)	F-Value	Significance
White Collar	Commit (.03)	Negative (-.17)	7.4	.007
Blue Collar	Commit (.01)	Negative (-.10)	3.7	.05
White Collar	Turnover (.09)	Negative (.31)	18.7	< .0001
Blue Collar	Turnover (.07)	Negative (.27)	15.9	< .0001
White Collar	Job Satis. (.17)	Negative (-.41)	49.7	< .0001
Blue Collar	Job Satis. (.15)	Negative (-.38)	55.3	< .0001
White Collar	Absent (-.004)	Negative (.008)	.01	.90
Blue Collar	Absent (.010)	Negative (.10)	2.93	.09
White Collar	Tardy (.03)	Negative (.17)	6.9	.007
Blue Collar	Tardy (.02)	Negative (.15)	7.6	.006
* regression coefficients are standardized				

Table 2 also indicates that H2 was supported by the results, as turnover intentions are significantly related to the workers' levels of positive/negative affect. As levels of positive affect increase turnover intentions decline and as levels of negative affect increase turnover intentions increase. While these findings are significant for both blue and white collar workers, an examination of the results indicates that 22 percent of the variance (R2 = .22) in turnover intention levels was explained by positive affect scores for blue collar workers, but less than 10 percent of the variance (R2 = .09) in turnover intention levels was explained by positive affect scores for white collar workers.

The findings also lend support to H3. As indicated in Table 2, positive affect scores are significantly related to the levels of job satisfaction for both white and blue collar employees. Also, the findings show that higher levels of negative affect lead to significantly lower levels of job satisfaction (lower levels of negative affect lead to higher levels of job satisfaction). Positive affect scores explain over 20 percent of the variation (R2 > .20) in job satisfaction levels.

The fourth hypothesis is not supported by the findings as neither positive nor negative affect are significantly related to worker absenteeism. As shown in the table, for both white and blue collar workers, the results indicate the affect levels are not significantly related to levels of absenteeism.

H5 is largely supported by the findings as negative affect levels are positively related to worker tardiness for both white and blue collar employees. However, with regard to the levels of positive affect, the relationship is significant only for white collar employees. As indicated in Table 2, as white collar employee levels of positive affect increase, worker tardiness levels decline. However, the relationship between tardiness and positive affect levels is not significant for blue collar workers.

While the tests of the hypotheses provide some insight into the issues regarding whether blue and white collar workers are substantially equal with regard to the relationships existing between affect levels (positive/negative) and the dependent variables (organizational commitment, turnover intentions, job satisfaction, absenteeism, and tardiness), questions may still remain regarding the equality of the two groups and their relationships. To determine whether differences exist between the two groups, the Chow (1960)

test was used. Chow (1960) developed an equation designed to determine the degree to which two sets of observations might be "regarded as belonging to the same regression model." The equation for assessing these differences is provided below:

$$\text{Chow} = \frac{(RSS - RSS_1 - RSS_2)/k}{(RSS_1 + RSS_2)/(n_1 + n_2 - 2k)} \sim F_{k,n_1+n_2-2k}$$

Where: RSS = residual sum of squares - pooled
RSS1 = residual sum of squares - group 1
RSS2 = residual sum of squares - group 2
n1 = number of observations - group 1
n2 = number of observations - group 2
k = number of parameters

Using this test, models were tested which evaluated the relationships existing between positive/negative affect and the relevant dependent variables (organizational commitment, turnover intentions, job satisfaction, absenteeism, and tardiness). The results of these regressions and the Chow Test are provided in Table 3 and are discussed below.

With regard to organizational commitment, the relationship existing between worker affect levels and organizational commitment is not significantly different between the two worker categories. The regression equations indicate that only positive affect is significantly related to organizational commitment in the regression model, while negative affect is not significantly related. The findings in this case indicated that there are no differences based on worker type (white vs. blue).

Similar findings exist pertaining to the relationships between positive/negative affect and turnover intentions. As shown, the differences between the two regression equations are not significant, and one can thus assume that the two models are equal. However, for these two equations, both positive and negative affect levels are significantly related to turnover intentions.

The Chow Test indicates significant differences between the two regression equations computed for job satisfaction. As shown, the Chow Test reveals that the two equations are not equal ($p = .0021$). A review of the findings indicates that the differences may lie in the increased size of the standardized betas for the blue collar grouping. As may be noted, the blue collar betas are .56 and .51 for positive and negative affect levels while the white collar betas are .45 and .43 respectively.

The results also indicate that differences between the two regression equations computed for absenteeism exist. However, in this case, interpretation is limited because the regression models themselves are not significant for either the white or blue collar workers. However, a review of the results indicates that the differences may lie in the increased standardized beta coefficient pertaining to the relationship between negative affect and absenteeism for the blue collar sample.

Table 3: Comparisons of Models Using the Chow Test					
	Dependent Variable (R2)	Positive Affect (p)	Negative Affect (p)	F-Value	Significance
Full Model	Commit (.26)	.63 (<.0001)	-.10 (.0843)	98.7	< .0001
White Collar	Commit (.21)	.59 (<.0001)	-.07 (.4661)	32.2	< .0001
Blue Collar	Commit (.26)	.60 (<.0001)	-.07 (.3492)	53.7	< .0001
Chow Test				1.8	.1461
Full Model	Turnover (.23)	-.36 (<.0001)	.24 (<.0001)	56.4	< .0001
White Collar	Turnover (.14)	-.22 (.0015)	.30 (.0010)	15.7	< .0001
Blue Collar	Turnover (.26)	-.42 (<.0001)	.18 (.0120)	36.6	< .0001
Chow Test				2.4	.07
Full Model	Job Satis. (.37)	.55 (<.0001)	-.51 (<.0001)	162.2	< .0001
White Collar	Job Satis. (.33)	.45 (<.0001)	-.43 (<.0001)	59.2	< .0001
Blue Collar	Job Satis. (.34)	.56 (<.0001)	-.51 (<.0001)	80.5	< .0001
Chow Test				4.9	.0021
Full Model	Absent (.01)	.01 (.7437)	.08 (.0222)	2.7	.0711
White Collar	Absent (-.01)	.01 (.7502)	.01 (.8206)	.06	.9419.
Blue Collar	Absent (.01)	.03 (.4568)	.10 (. 0728)	1.7	.1791
Chow Test				3.1	.0282
Full Model	Tardy (.02)	.00 (.8130)	.04 (.0012)	5.5	.0045
White Collar	Tardy (.04)	-.03 (.0343)	.03 (.0669)	5.7	.0040
Blue Collar	Tardy (.03)	.01 (.2873)	.04 (.0047)	4.3	.0150
Chow Test				1.8	.1545
* regression coefficients are standardized					

Finally, the Chow Test indicates that the two regression equations are not significantly different as they relate to the relationship between the employees' affect (positive/negative) levels and their tardiness. Nevertheless, the findings show that tardiness is significantly affected by positive affect for the white collar grouping and significantly affected by negative affect for the blue collar grouping. Yet, these differences are not significant and thus one cannot interpret the two equations as being significantly different.

DISCUSSION AND IMPLICATIONS

The findings clearly indicate that the workers' relative PA/NA levels are significantly related to their job satisfaction, organizational commitment, turnover intentions, and tardiness. These findings suggest that firms could logically use PA/NA as a tool in their employee selection and training processes. By selecting employees with higher levels of positive affect and lower levels of negative affect, firms might discover that

their employees are more satisfied, more organizationally committed, and have lower levels of turnover intentions.

Indeed, these findings suggest that managers might use positive and negative affect levels as a selection tool. It has generally been assumed that "positive people" make better employees. However, these findings indicate that being "positive" alone is not the "ideal" circumstance. Similarly, the results indicate that one's being negative alone is not the "worst" circumstance. Instead the findings show that one who has the following traits: positive, happy, perceiving the "best" in situations; combined with traits of being low in anger, negativity, etc. will obtain the optimal work attitudes. On the separate end of the continuum, the individual who has traits that don't allow him/her to experience joy, to see the good in situations, or to be positive; combined with the worker who possesses traits that make him/her angry, negative, etc. will possess the least desirable work attitudes. However, combinations of these traits, may allow a worker to experience less than optimal work attitudes.

Thus, it may be concluded that managers might use positive and negative affect levels of their employees discriminately. For example, the fact that a worker has a high positive affect score (or a high negative affect score) alone should not necessarily qualify (or disqualify) him/her for a job. Instead, the manager needs to assess the combinations of affect levels to use this as a tool in selection.

A manager interested in selecting and developing high performing workers may discover that the measurement of the individual's dispositional affect is an indicator of his/her likely work attitudes. However, the findings in this study indicate that the relationship is not a clear-cut as one might speculate. Instead, the findings indicate that combinations of positive and negative affect levels are related to work attitudes. Based on this finding, managers should evaluate the applicants' levels of both positive and negative affect to ensure that those with the lowest (i.e., worst) combination of scores are not selected and then encourage the development of higher levels of positive affect and lower levels of negative affect through selection decisions.

This study examines a topic which has not been studied in depth in nearly 30 years. Indeed, an important purpose of the current study was to assess differences in work attitudes in blue and white collar samples. Further, a strength of the current study was the high response rate (85%) which reduces non-response bias in the data. Within the sample, significant differences were found with regard to dispositional affectivity and job satisfaction and absenteeism. In both instances, it was found that the relationships were stronger for the blue collar sample. It is interesting to note that there were no significant differences found with regard to dispositional affectivity and organizational commitment, turnover, and tardiness. Hence, companies should be aware of the strong relationship that exists for blue collar workers in terms of dispositional affectivity and job satisfaction and absenteeism. That is, companies desiring high levels of both of these job attitudes should certainly pay attention to their blue collar workers. Selecting for certain levels of both positive and negative affectivity might be advantageous for companies employing large numbers of blue collar workers. Given the mounting evidence of the impact of dispositional affectivity as it relates to many work attitudes, firms should seriously consider selection issues with regard to both positive and negative affectivity.

LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

While the findings reported in this research provide strong indications that there exist significant differences in specific work attitudes and behaviors between blue and white-collar workers, limitations do

exist. The first limitation is related to the fact that these results are based on a single company, a single group of workers, at a single point in time. Thus, the sampling frame limits the generalizability of these findings. Although a strength of the current study was the examination of many attitudinal and behavioral variables in a single sample, it also warrants replication. Second, the research is limited by the degree to which both the criterion variables and the independent variables are accurately measured.

These limitations provide potential avenues for future research. The first suggestion for subsequent research involves expanding the sample to include workers from other firms, industries and in other geographic regions. A related extension of the present research could entail a longitudinal study. This research would assess the stability of these relationships over time and could lead to a more concrete evaluation of the empirical relationships between these variables. A third area for future research might entail an evaluation of the measures used in the research. This research would then lead to an establishment of norms for the scales which could then be used in identifying employees with the most desirable work attitudes and behaviors.

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THE THEORETICAL BASIS AND DIMENSIONALITY OF THE TALENT MANAGEMENT SYSTEM

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ABSTRACT

This is a treatise on the development and validation of the ExecuSmart Talent Management System which has the ability to determine leadership roles in organizations, and provide a fit for that role through the assessment of applicants. The ability to determine who is best fitted for an organization and those who must be eliminated for the benefit of the organization is in and of itself an exceptional tool; however, this system can be utilized for the training and development of those personnel already entrenched in an organization. The theoretical basis and dimensionality are also explicated.

INTRODUCTION

After more than 15 years of development, field completion by more than 10,000 executives, and rigorous statistical evaluation, the collection of instruments incorporated in the ExecuSmart Talent Management System is highly reliable, valid and robust. Existing research shows that past attempts to predict leader behavior based upon a single cognitive mechanism has not demonstrated the predictability that business and Human Resource Leaders find useful in assessing and developing leadership capability. The *Talent Management System* is predicated on the idea that key cognitive dimensions have the ability to be predictive of performance only when they are specified together in a unified model. In this article, the scholarly background of the collection of instruments is presented and the statistical testing which demonstrates a robust nature is described.

DESCRIPTION OF THE SYSTEM

The *Talent Management System* is an integrated set of analytical tools for the creation and management of Talent Knowledge. The Research Team established the *System* on a theoretical foundation, enlightened by actual field experience and application, and concentrated on a process of continuous improvement based upon actual implication impact. It includes four modules: the *Leadership Success Profile*, the *Leadership Capability Indicator*, the *Context Based 360° Leadership Assessment*, and the *Talent Director*, each of which is an instrument based tool, and each of which contributes to the completion of a system of talent management for organizations involved in executive and leadership assessment, evaluation, training and development.

The first step in the process is the *Leadership Success Profile*. This instrument, which requires about 45 minutes to complete, is administered to an organization's subject matter experts: those individuals who have a high level of knowledge about the company and the specific position in the organization which is under review. The instrument assesses the shared perspectives of the top management team of the specific, ranked, leadership competencies which are necessary for success in a specific leadership position within that organization, taking into consideration the market and competitive environment of the organization, its strategic orientation and culture. These ranked competencies are therefore unique to the individual company, and form a foundation for understanding the leadership needs of a given position within that company. The process uses a forced choice format built upon a foundation of redundancy which avoids the potential for response bias and fosters the development of a set of Tier One, Two and Three, empirically defined specific competencies required for success by an individual executive in a specific leadership position within a specific organization.

The second step in the process is the *Leadership Capability Indicator*. This instrument, which requires about 45 minutes to complete, is administered to a specific individual who is the subject of assessment, evaluation, training or development. It is a forced choice format in 22 dimensions which assesses an individual's self evaluation of his or her leadership behavior predispositions with respect to Five Cs of Leadership: Leadership Capacity, Leadership Character, Leadership Communication, Leadership Collaboration and Leadership Change. It produces an empirically defined perspective of an individual's cognitive natural state with regard to the various leadership behaviors and compares those to benchmark averages of the other executives in the specific organization, and to a selected group of executives, which can consist of *Fortune 1000* or *Inc. 500* executives, or executives from any of more than 40 specific industries.

The third step in the process is the *Context Based 360° Leadership Assessment*. This instrument, which requires about 45 minutes to complete, is administered to a specific individual in a specific position within an organization, and to that individual's superiors, peers, and subordinates. The instrument is a forced choice format in 16 dimensions which permits the identification of perceived and preferred behaviors with respect to the Four Types of Leadership: Directive Leadership, Transactional Leadership, Transformational Leadership, and Empowering Leadership. It produces an empirically defined comparison of an individual's perspective of the intensity of a leadership behavior which is desired by the organization to that individual's self evaluation of his or her delivery of that leadership behavior. Further, the instrument produces a comparison of the individual's perceptions to those of his or her superiors, peers and subordinates.

The fourth step in the process is the *Talent Director*, which is a graphical interface of the previous three measures. Specifically, the *Talent Director* prioritizes graphical representations of the outcomes of the *Leadership Capability Indicator* and the *Context Based 360° Leadership Assessment*, to the prioritized leadership competencies identified by the organization through the *Leadership Success Profile*. The outcome is an empirically derived fit index which demonstrates the percentage of each specific desired leadership competency which the individual embodies in his or her cognitive predispositions.

Taken as a whole, the *Talent Management System* is a complete package which provides empirical support to an organization in the executive recruitment and assessment process, executive evaluation process, and executive training and development process. As it is customized to a given organization and position, it is useful in determining positional fit and in establishing experience ladders for targeted, long term, executive development.

THEORETICAL FOUNDATION, RELIABILITY AND VALIDITY OF THE LEADERSHIP SUCCESS PROFILE

The first component of the System, the *Leadership Success Profile*, began with a rejection of traditional competency model building. The traditional approach is to utilize leadership competency interviews with selected executives or teams of executives within an organization, or to rely on focus groups of executives within the organization. Such approaches are highly dependent on the expertise of the facilitator. They are extremely time consuming and can be prohibitively expensive. Further, they are subject to varying and unidentifiable levels of response bias. When groups are used, differences of opinion which arise within the groups are difficult to resolve and may lead to yet more response bias and political issues. When individuals are surveyed, establishing priorities among the resulting myriad of competencies becomes highly subjective.

The Research Team evolved an approach which eliminates response bias and empirically and independently establishes priorities of leadership competencies. The approach involves beginning with a predetermined set of leadership competencies. The *Leadership Success Profile* starts with a list of 45 specific leadership competencies which the research team identified as having strong theoretical support in the literature. The specific competencies have been identified over a period of years and are still evolving as research team members continue their research. These competencies are displayed in Table One, along with the specific theoretical support for each competency. Administrators of the System can expand the initial list when requested by a specific organization with competencies which its executives feel are omitted, however, training of the administrators emphasizes the need for extreme care in such an expansion, due to the potential for response bias identified above.

Table One: Theoretical Foundation for the Leadership Success Profile

Leadership Competency	Citation
Able to effectively confront Direct Reports	Paglis, L. & Green, S. 2002. Leadership Self-Efficacy and Managers' Motivation for Leading Change. *Journal of Organizational Behavior*, 23 (2): 215-235.
Action Oriented	Kirkman, B. & Rosen, B. 1999. Beyond self-management: Antecedents and consequences of team empowerment. *The Academy of Management Journal, 42 (1): 58-74.* Bass, B. 1998. *Transformational leadership: Industrial, Military, and Educational Impact.* Mahwah, NJ: Erlbaum.
Approachable and Warm	Podsakoff, P., MacKenzie, W. & Bommer, W. 1996. Transformational Leader Behaviors and Substitutes for Leadership as Determinants of Employee Satisfaction, Commitment, Trust, and Organizational Citizenship Behaviors. *Journal of Management,* 22 (2): 259-298. Hopper, J. & Nielsen, J. 1991. Recycling as Altruistic Behavior: Normative and Behavioral Strategies to Expand Participation in a Community Recycling Program. *Environment and Behavior*, 23 (2): 195-220.
Challenges the Status Quo	Dess, G. & Pciken, J. 2000. Changing Roles: Leadership in the 21st Century. *Organizational Dynamics*, 28 (3): 18-34. Zhou, J. & George, J. 2003. Awakening Employee Creativity: The Role of Leader Emotional Intelligence. *The Leadership Quarterly*, 14 (4-5): 545-568.

Table One: Theoretical Foundation for the Leadership Success Profile	
Leadership Competency	**Citation**
Composed in Pressure Situations	Burke, C.S., Fiore, S. & Salas, E. 2002. The Role of Shared Cognition in Enabling Shared Leadership and Team Adaptability. *Shared Leadership: Reframing the Hows and Whys of Leadership.* Thousand Oaks, CA: Sage. Goleman, D. 2000. Leadership That Gets Results. *Harvard Business Review*, March-April.
Creative	Bellows, R.M. 1959. *Creative Leadership*. Englewood Cliffs, NJ: Prentice-Hall. Ford. C. 1996. A Theory of Individual Creative Action in Multiple Social Domains. *The Academy of Management Review,* 21 (4): 1112-1142.
Deals well with Paradox	Cameron, K. 1986. Effectiveness as Paradox: Consensus and Conflict in Conceptions of Organizational Effectiveness. *Management Science*, 32 (5): 539-553. Farson, M. 1996. *Management of the Absurd: Paradoxes in Leadership*, New York, NY: Touchstone.
Delegates Effectively	Klein, K., Ziegert, J., Knight, A. & Xiao, Y. 2006. Dynamic Delegation: Shared, Hierarchical, and Deindividualized Leadership in Extreme Action Teams. *Administrative Science Quarterly*, 51 (4): 590-621. Bass, B. & Avolio, B. 1994. *Improving Organization Effectiveness: Through Transformational Leadership*, Thousand Oaks, CA: Sage.
Develops Subordinates	Yukl, G.A. 1989. *Leadership in Organizations* (5th ed.). Englewood Cliffs, NJ: Prentice-Hall. Kuhnert, K. 1994. Transforming Leadership: Developing People Through Delegation. *Improving Organizational Effectiveness Through Transformational Leadership*, Thousand Oaks, CA: Sage
Effective at giving orders	Goleman, D. 2000. Leadership That Gets Results. *Harvard Business Review*, March-April. Pearce, C. & Sims, H. 2002. Vertical versus shared leadership as predictors of the effectiveness of change management teams: An examination of aversive, directive, transactional, transformational, and empowering leader behaviors. *Group Dynamics: Theory, Research, and Practice*, 6 (2): 172-197.
Effective at Managing Innovation	Howell, J. & Avolio, B. 1993. Transformational leadership, transactional leadership, locus of control, and support for innovation: Key predictors of consolidated-business-unit performance. *Journal of Applied Psychology*, 78 (6): 891-902. Tushman, M. & Anderson, P. 1997. *Managing Strategic Innovation and Change*. New York: Oxford University Press.
Effective Communicator	Marks, M., Zaccaro, S. & Mathieu, J. 2000. Performance implications of leader briefings and team-interaction training for team adaptation to novel environments. *Journal of Applied Psychology*, 85 (6): 971-986. Jarvenpaa, S. & Leidner, D. 1999. Communication and Trust in Global Virtual Teams. *Organization Science*, 10 (6): 791-815.
Effective Listener	Bennis, W. & Nanus, B. 2003. *Leaders: Strategies for taking charge*. New York, NY: HarperCollins.
Effective Negotiator	Kozlowski, S. & Doherty, M. 1989. Integration of Climate and Leadership: Examination of a Neglected Issue. *Journal of Applied Psychology*, 74 (4): 546-553. Tepper, B., Uhl-Bien, M, Kohut, G., Rogelberg, S., Lockhart, D. & Ensley, M. 2006. Subordinates' Resistance and Managers' Evaluations of Subordinates' Performance. *Journal of Management,* 32 (2): 185-209.

Table One: Theoretical Foundation for the Leadership Success Profile	
Leadership Competency	**Citation**
Effective Planner	Mintzberg, H. & Waters, J. 1985. Of Strategies, Deliberate and Emergent. *Strategic Management Journal,* 6: 257-272. Ancona, D. 1990. Outward Bound: Strategies for Team Survival in an Organization. *The Academy of Management Journal,* 33 (2): 334-365.
Effective Presentation Skills	Vandewalle, D. 2001. Goal Orientation: Why Wanting to Look Successful Doesn't Always Lead to Success. *Organizational Dynamics*, 30(2): 162-171. Conger, J. 1991. Inspiring Others: The Language of Leadership. *Academy of Management Executive,* 5 (1): 31-45.
Effective Team Builder	Dirks, K. 2000. Trust in Leadership and Team Performance: Evidence from NCAA Basketball. *Journal of Applied Psychology*, 85 (6): 1004-1012. Druskat, V. & Wheeler, J. 2003. Managing from the Boundary: The Effective Leadership of Self-Managing Work Teams. *The Academy of Management Journal,* 46 (4): 435-457.
Effective Time Manager	Yukl, G.A. 1989. *Leadership in Organizations* (5th ed.). Englewood Cliffs, NJ: Prentice-Hall. Marx, R. 1982. Relapse Prevention for Managerial Training: A Model for Maintenance of Behavior Change. *The Academy of Management Review*, 7 (3): 433-441.
Effectively Sets Priorities	Zohar, D. 1980. Safety Climate in Industrial Organizations: Theoretical and Applied implications. *Journal of Applied Psychology*, 65 (1): 96-102. Morden, T. 1997. Leadership as Competence. *Management Decision*, 35 (7): 519-526.
Effectively Solves Problems	Mumford, M., Zaccaro, S., Harding, F. & Jacobs, T. 2000. Leadership Skills for a Changing World: Solving Complex Social Problems. *The Leadership Quarterly*, 11 (1): 11-35. Kirkpatrick, S. & Locke, E. 1991. Leadership: Do Traits Matter? *Academy of Management Executive,* 5 (2): 48-60.
Focused on Customers	Miller, D. 1986. Configurations of Strategy and Structure: Towards a Synthesis. *Strategic Management Journal*, 7 (3): 233-249. Slater, S. & Narver, J. 1995. Market Orientation and the Learning Organization. *Journal of Marketing*, 59 (3): 63-74.
Goal Oriented	House, R. 1971. A Path Goal Theory of Leader Effectiveness. *Administrative Science Quarterly,* 16 (3): 321-339. House, R. 1996. Path-goal Theory of Leadership: Lessons, Legacy, and a Reformulated Theory. *The Leadership Quarterly,* 7 (3): 323-352.
Great at Motivating Others	Vera, D. & Crossman, M. 2004. Strategic Leadership and Organizational Learning. *Academy of Management Review*, 29 (2): 222-240. Katz, D. & Kahn, R. 1978. *The Social Psychology of Organizations.* New York, NY: Wiley.
Has Work and Life in Balance	Lambert, S. 2000. Added Benefits: The Link Between Work-Life Benefits and Organizational Citizenship Behavior. *Academy of Management Journal*, 43 (5): 801-815. Hill, E.J., Hawkins, A., Ferris, M. & Weitzman, M. 2001. Finding an Extra Day a Week: The positive Influence of perceived job Flexibility on Work and Family Life Balance. *Family Relations*, 50 (1): 49-58.
High Levels of Integrity and Trust	Kim, P., Ferrin, D., Cooper, C. & Dirks, K. 2004. Removing the Shadow of Suspicion: The Effects of Apology Versus Denial for Repairing Competence-Versus Integrity Based Trust Violations. *Journal of Applied Psychology*, 89 (1): 104-118. Wicks, A., Berman, S. & Jones, T. 1999. The structure of optimal Trust: Moral and Strategic Implications. *Academy of Management Journal*, 24 (1): 99-118.

Table One: Theoretical Foundation for the Leadership Success Profile	
Leadership Competency	**Citation**
Inspirational	Boas, S., House, R. & Arthur, M. 1993. The Motivational Effects of Charismatic Leadership: A Self-Concept Based Theory. *Organization Science*, 4 (4): 577-594. Bass, B. 1988. The Inspirational Processes of Leadership. *Journal of Management Development*, 7 (5): 21-31.
Interpersonally Savvy	Giglio, L, Diamante, T. & Urban, J. 1998. Coaching a Leader: Leveraging Change at the Top. *Journal of Management Development*, 17 (2): 93-105. Lipman-Blumen, J. 2000. *Connective Leadership: Managing in a Changing World.* New York: Oxford University Press.
Is Compassionate	Frost, P. 2004. Handling Toxic Emotions: New Challenges for Leaders and their Organization. *Organizational Dynamics*, 33 (2): 111-127. Brodbeck, F.C, Frese, M. and Javidan, M. (2002) Leadership made in Germany: Low on Compassion, high on performance. *Academy of Management Executive*. 16(1): 16-25. Boyatzis, R.E., Smith, M.L., and Blaize, N. 2006. Developing Sustainable Leaders Through Coaching and Compassion. *Academy of Management Learning and Education. 5*(1): 8-24.
Learns on the Fly	Kirkman, B. & Rosen, B. 2000. Powering Up Teams. *Organizational Dynamics*, 28 (3): 48-66. Karaevli, A. & Hall, D.T. 2003. Growing Leaders for Turbulent Times: Is Succession Planning Up to the Challenge? *Organizational Dynamics*, 32 (1): 62-79.
Makes Decisions When They Need to be Made	Van De Ven, A. & Delbecq, A. 1974. The Effectiveness of Nominal, Delphi, and Interacting Group Decision Making Processes. *The Academy of Management Journal*, 17 (4): 605-621. Eisenhardt,, K. & Bourgeois, L.J. 1988. Politics of Strategic Decision Making in High-Velocity Environments: Toward a Midrange Theory. *The Academy of Management Journal*, 31 (4): 737-770.
Managerial Courage	Adair, J. 1983. *Effective Leadership.* London: Pan. Kotter, J. 1990. *A Force for Change: How Leadership Differs from Management.* New York, NY: Free Press.
Manages Conflict Well	Thomas, K. 1992. Conflict and Conflict Management: Reflections and Update. *Journal of Organizational Behavior*, 13 (3): 265-274. Pondy, L. 1967. Organizational Conflict: Concepts and Model. *Administrative Science Quarterly*, 12 (2): 296-320.
Manages Organizational Vision and Purpose	Baum, R., Locke, E. & Kirkpatrick, S. 1998. A Longitudinal Study of the Relation of Vision and Vision Communication to Venture Growth in Entrepreneurial Firms. *Journal of Applied Psychology*. 83 (1): 43-54. Kirkpatrick, S. & Locke, E. 1996. Direct and Indirect Effects of Three Core Charismatic Leadership Components on Performance and Attitudes. *Journal of Applied Psychology*, 81 (1): 36-51.
Manages Up Well	Spreier, S., Fontaine, M. & Malloy, R. 2006. Leadership Run Amok: The Destructive Potential of Overachievers. *Harvard Business Review,* June.
Perseveres through Difficult Times	Kirkpatrick, S. & Locke, E. 1991. Leadership: Do Traits Matter? *The Executive*, 5 (2): 48-60. Norman, S., Luthans, B. & Luthans, K. 2005. The Proposed Contagion Effect of Hopeful Leaders on the Resiliency of Employees and Organizations. *Journal of Leadership & Organizational Studies*, 12 (2): 55-64.

Table One: Theoretical Foundation for the Leadership Success Profile	
Leadership Competency	**Citation**
Politically Savvy	Rosenbloom, R. 2000. Leadership, Capabilities, and Technological Change: The Transformation of NCR on the Electronic Era. *Strategic Management Journal*, 21 (10/11): 1083-1103.
Reads People Well	Goleman, D. 1998. What Makes a Leader? *Harvard Business Review*, 76: 93-104. Kellettm J., Humphrey, R. & Sleeth, R. 2002. Empathy and Complex Task Performance: Two Routes to Leadership. *The Leadership Quarterly*, 13 (5): 523-544.
Rewards People Effectively	Bass, B. & Avolio, B. 1994. Transformational Leadership and Organizational Culture. *International Journal of Public Administration*, Spring: 112-121. Katz, D. & Kahn, R. 1978. *The Social Psychology of Organizations.* New York, NY: Wiley.
Self Confident	Paglis, L. & Green, S. 2002. Leadership Self-Efficacy and Managers' Motivation for Leading Change. *Journal of Organizational Behavior*, 23 (2): 215-235. Shamir, B., House, R. & Arthur, M. 1993. The Motivational Effects of Charismatic Leadership: A Self Concept Based Theory. *Organization Science,* 4 (4): 577-594.
Smart	Finkelstein, S. 2003. *Why Smart Executives Fail*. Penguin Group. Day, D., Gronn, P. & Salas, E. 2004. Leadership Capacity Teams. *The Leadership Quarterly*, 15 (6): 857-880.
Tolerates Ambiguity	Lengnick-Hall, M. & Lengnick-Hall, C. 1999. Leadership Jazz: An Exercise in Creativity. *Journal of Management Education*, 23 (1): 65-70. Furnham, A. & Ribchester, T. 1995. Tolerance of Ambiguity: A Review of the Concept, its Measurement and Applications. *Current Psychology*, 14 (3): 179-199.
Understands the Business	Bennis, W. & O'Toole, J. 2005. How business schools lost their way. *Harvard Business Review*, 83 (5): 96-104. Gordon, M., Slade, L.A. & Schmitt, N. 1986. The "Science of the Sophomore" Revisited: From Conjecture to Empiricism. *The Academy of Management Review*, 11 (1): 191-207.
Very Organized	Bennis, W. & Nanus, B. 2003. *Leaders: Strategies for Taking Charge*. New York, NY: HarperCollins. Zaleznik, A. 2004. Managers and Leaders: Are they different? *Harvard Business Review*, 82 (1): 74-81.
Very Patient	Russell, R. 2001. The Role of Values in Servant Leadership. *Leadership & Organization Development Journal,* 22 (2): 76-84. Conger, J. 1998. The Dark Side of Leadership. *Leading Organizations: Perspectives for a New Era.* Thousand Oaks, CA: Sage.
Visionary	Baum, R., Locke, E. & Kirkpatrick, S. 1998. A Longitudinal Study of the Relation of Vision and Vision Communication to Venture Growth in Entrepreneurial Firms. *Journal of Applied Psychology*. 83 (1): 43-54. Conger, J. & Kanungo, R. 1987. Toward a Behavioral Theory of Charismatic Leadership in Organizational Settings. *The Academy of Management Review,* 12 (4): 637-647.

The Research Team recognized that a strong library of leadership competencies has limited value for a specific organization without empirical prioritization. The number of competencies which are identified as valuable is simply too large to be of practical value to the organization. Those competencies must be ranked in a way which establishes the most critical of skills without conflict of interest challenges and without participant bias. Consequently, the Team developed a Patent Pending process which is based on an advanced

conjoint application. Such conjoint applications have been demonstrated to be effective in a range of situations that require an understanding of the importance of certain characteristics or capabilities (see Louviere, 1988; Wittink and Cattin, 1989; Green and Srinivasan, 1990; and Krishnan and Ulrich, 2001, for some key examples). As described above, the conjoint application involves a forced choice pairing of the various competencies in a redundant model which permits the independent, empirical determination of ranked outcomes.

The outcomes are tested for agreement using James, Demaree, and Wolf's (1984) RWGJ approach to testing and understanding agreement. This provides the administrator an understanding of agreement or consistency between the various executives who have been involved in the process. Further, the system produces specific measures of the consistency of each individual's responses across the large number of matched pairs. The combination of the two tests informs the administrator as to the level of agreement on each competency and the consistency of the responses of each executive participant. Administrators are trained to conduct outlier analysis when the results of the tests demonstrate the need. Administrators are cautioned, however, as to the danger of excessive interference in the process as each human intervention has the potential to introduce bias.

From a theoretical perspective, Hoyle, Harris and Judd (2002) were very clear that a field application with a larger number of subjects will have higher reliability and validity. Podsakoff and Organ (1986) reported that designs with multiple informants are capable drivers of reliability and validity. The *Leadership Success Profile* incorporates both aspects.

A series of interviews were conducted with actual, trained administrators of the *System* with regard to their experience with outliers. Without exception, the administrators reported that outliers were rare in practice. When an individual competency has a low level of agreement, the administrators remove it from the ranked list of competencies. Given the large number of competencies which result from the process, the authors find that to be a robust approach to preserving the reliability and validity of the process.

The Tier 1 and Tier 2 competencies which emerge from the empirical process become the customized foundation for the implementation of the System. However, the individual competencies themselves are problematic. Both Hoyle, Harris and Judd (2002) and Nunnally and Bernstein (1994) report that outcome variables such as these leadership competencies are difficult to directly measure. Consequently, the actual measurement process is based upon examination of underlying drivers of the various leadership behaviors. The rest of the System is devoted to examining those drivers. Consequently, the overall reliability and validity of the *Leadership Success Profile* is deeply bound with that of the other modules of the System. The authors will examine each of the remaining modules in turn, before arriving at an overall assessment of the System.

Theoretical Foundation, Reliability and Validity of the Leadership Capability Indicator

Judge and Bono (2000) and Judge, Erez, Bono and Thoresen (2003) developed the concept of Core Self Evaluations as a means of understanding key cognitive patterns that drive behaviors. Judge and Bono (2000) and Judge et al. (2004) demonstrated empirically that there is a strong linkage between these core self evaluations and leader behaviors like transformational leadership. Ensley, et al. (2001; 2003; 2006) expanded this work and demonstrated this link to directive, transactional and empowering leader behaviors. However,

Judge and Bono (2000) and Judge and Hurst (2008) argue that the core self evaluations model and the *Big Five* personality model are too coarse and that there is a need to refine a cognitive patterning model or set of core self evaluations. In response to that call, the Research Team refined the core self evaluations concept to include a full range of cognitive functions. The result was a set of 22 dimensions of cognitive predispositions. Table Two outlines each of the expanded set of core self evaluations and presents examples of the literature support which links the variables to leadership behaviors.

A sample of 1,754 executives from 44 industries was developed to examine the reliability and validity of the *Leadership Capability Indicator*. The subjects were 68% male, held a variety of managerial positions, and ranged in age from 28 to 71. The participants were chosen on a convenience basis. The central limit theorem (Tijms, 2004) suggests that, due to the sample size, the level of confidence of this sample approaches that of a random sample. This provides us with a higher level of confidence such that the findings can be extrapolated to the broader universe of all executives.

Table Two: Theoretical Foundation for the Leadership Capability Indicator

Leadership Measure	Citation
Self Regulation	Kark, R. & Van Dijk, D. 2007. Motivation To Lead, Motivation to Follow: The Role of the Self-Regulatory Focus in Leadership Processes. *Academy of Management Review*, 32 (2): 500-528. Brockner, J. & Higgins, E.T. 2001. Regulatory Focus Theory: Implications for the Study of Emotions at Work. *Organizational Behavior and Human Decisions Processes,* 86 (1): 35-66.
Cognitive Activity	Hooijberg, R., Hunt, J. & Dodge, G. 1997. Leadership Complexity and Development of the leaderplex Model. *Journal of Management,* 23 (3): 375-408. Day, D., Gronn, P. & Salas, E. 2004. Leadership Capacity in Teams. *The Leadership Quarterly*, 15 (6): 857-880.
Ambiguity Tolerance	Madzar, S. 2001. Subordinates' Information Inquiry: Exploring the effect of perceived leadership style and individual differences. *Journal of Occupational and Organization Psychology*, 74 (2): 221-232. Cox, T. & Blake, S. 1991. Managing cultural diversity: Implications for organizational competitiveness. *Academy of Management Executive*, 5 (3): 45-56.
Coping Mechanisms	Sosik, J. & Godshalk, V. 2000. Leadership Styles, Mentoring Functions Received, and Job-Related Stress: A Conceptual Model and Preliminary Study. *Journal of Organizational Behavior*, 21 (4): 365-390. Lipshitz, R. & Strauss, O. 1997. Coping with Uncertainty: A Naturalistic Decision-Making Analysis. *Organizational Behavior and Human Decision Processes,* 69 (2): 149-163.
General Outlook	Brown, D. & Keeping, L. 2005. Elaborating the construct of transformational leadership: The role of affect. *The Leadership Quarterly*, 16 (2): 245-272. Ilies, R., Judge, T. & Wagner, D. 2006. Making Sense of Motivational Leadership: The Trail from Transformational Leaders to Motivated Followers. *Journal of Leadership & Organizational Studies*, 13 (1): 1-22.
Big Five Personality Factors: Emotional Stability Agreeableness Openness	Schien, E. 2004. *Organizational Culture and Leadership*. San Francisco, CA: Jossey-Bass. Lim, B. & Ployhart, R. 2004. Transformational Leadership: Relations to the Five-Factor Model and Team Performance in Typical and Maximum Contexts. *Journal of Applied Psychology*, 89 (4): 610-621.

Table Two: Theoretical Foundation for the Leadership Capability Indicator	
Leadership Measure	**Citation**
Conscientiousness Extraversion	Bono, J. & Judge, T. 2004. Personality and Transformational and Transactional Leadership: A Meta-Analysis. *Journal of Applied Psychology*, 89 (5): 901-910.
Individual Consideration	Kipnis, D. & Vanderveer, R. 1971. Ingratiation and the use of power. *Journal of Personality and Social Psychology*, 17 (3): 280-286. Avolio, B. & Bass, B. 1995. Individual Consideration Viewed at Multiple Levels of Analysis: A Multi-level Framework for Examining the Diffusion of Transformational Leadership. *The Leadership Quarterly*, 6 (2): 199-218.
Learning Agility	Karaevli, A. & Hall, D.T. 2003. Growing Leaders for Turbulent Times: Is Succession Planning Up to the Challenge? *Organizational Dynamics*, 32 (1): 62-79. Lombardo, M. & Eichinger, R. 2000. High Potentials as High Learners. *Human Resource Management*, 39 (4): 321-329.
Need for Achievement	Yukl, G. 2002. *Leadership in Organizations*. Englewood Cliffs, NJ: Prentice-Hall. Hofstede, G. 1980. Motivation, Leadership, and Organization: Do American Theories Apply Abroad? *Organizational Dynamics*, 9 (1): 42-63.
Need for Control and Locus of Control	Miller, D., Kets De Vries, M. & Toulouse, J. 1982. Top Executive Locus of Control and Its Relationship to Strategy-Making, Structure, and Environment. *The Academy of Management Journal*, 25 (2): 237-253. Etzioni, A. 1964. *Modern Organizations*. Englewood Cliffs, NJ: Prentice-Hall. Ghoshal, S. & Moran, P. 1996. Bad for Practice: A Critique of the Transaction Cost theory. *The Academy of Management Review*, 21 (1): 13-47.
Self Confidence	Kipnis, D. & Lane, W. 1962. Self-confidence and Leadership. *Journal of Applied Psychology*, 46 (4): 291-295. Conger, J. & Kanungo, R. 1987. Toward a Behavioral Theory of Charismatic Leadership in Organizational Settings. *The Academy of Management Review,* 12 (4): 637-647.
Self Awareness: Emotional Quotient	Goleman, D. 2000. Leadership That Gets Results. *Harvard Business Review*, March-April. Sosik, J. & Megerian, L. 1999. Understanding Leader Emotional Intelligence and Performance. *Group & Organization Dynamics,* 24 (3): 367-390.
Communication Competence	Penley, L. & Hawkins, B. 1985. Studying Interpersonal Communication in Organizations: A Leadership Application. *The Academy of Management Journal*, 28 (2): 309-326. Bass, B. & Avolio, B. 1994. *Improving Organization Effectiveness Through Transformational Leadership*, Thousand Oaks, CA: Sage.

Using this sample, Internal Consistency (Cronbach's Alpha), Split Half, and Test Retest reliability were assessed. Reliability refers to the consistency of an instrument, or the tendency for that instrument to produce the same outcomes consistently over time. Table Three outlines our findings. Cronbach's Alpha is a statistic commonly used as an estimator of the internal consistency reliability of a psychometric test score for a sample of subjects. It was first named as alpha by Lee Cronbach in 1951 (Cronbach, 1951). In general, the higher the statistic, which ranges from 0 to 1, the higher the reliability of the instrument. The alphas ranged from 0.69 to 0.92, strong findings, across the 22 dimensions.

Table Three: Reliability Test Results for the Leadership Capability Indicator			
Instrument Dimensions	**Cronbach's Alpha**	**Split Half**	**Test Retest**
Cognitive Activity	0.89	0.80	0.76
Learning Agility	0.83	0.71	0.71
Ambiguity Tolerance	0.91	0.74	0.81
Self Regulation - Prevention	0.72	0.77	0.67
Self Regulation - Promotion	0.74	0.79	0.65
General Outlook	0.77	0.71	0.73
Emotional Quotient/Self Awareness	0.84	0.83	0.77
Self Confidence	0.79	0.90	0.68
Individual Consideration	0.73	0.81	0.63
Locus of Control	0.78	0.72	0.59
Need for Control	0.83	0.84	0.81
Need for Achievement – External	0.87	0.67	0.71
Need for Achievement – Internal	0.76	0.72	0.67
Problem Solving	0.71	0.64	0.65
Support Seeking	0.69	0.77	0.77
Problem Avoidance	0.73	0.81	0.66
Communication Competence	0.68	0.71	0.74
Emotional Stability	0.91	0.86	0.83
Extraversion	0.88	0.91	0.87
Openness	0.87	0.93	0.79
Agreeableness	0.88	0.89	0.88
Conscientiousness	0.92	0.94	0.84

The Spilt Half test is estimated as the Pearson product-moment correlation coefficient between two halves of the instrument, treated as alternate forms of the measure (Allen and Yen, 2002). Again, the statistic ranges from 0 to 1, and the higher the statistic, the higher the reliability of the instrument.The split half reliability range was 0.64 to 0.94, strong findings, across the 22 dimensions.

The test-retest involved a second administration of the instrument to the subjects 24 months after the first administration. To estimate reliability, the authors calculated the Pearson product-moment correlation coefficient of the two administrations (Allen and Yen, 2002). The test-retest statistics ranged from 0.59 to 0.88, strong findings, across the 22 dimensions.

Reliability is not the same thing as validity. Reliability means that an instrument is measuring something and measuring it consistently. That does not mean that the instrument is measuring what it is

supposed to be measuring. Consequently, in evaluating an instrument, validity is tremendously important, yet it is not the authors' intention to downplay the importance of reliability. The entry in Wikipedia (2009) is instructive: "...reliability is precision, while validity is accuracy."

In determining the best approach to examining validity, the Research Team recognized that practical application of an instrument with 22 dimensions was challenging. Consequently, the Team established a mapping of the 22 dimensions into five constructs, which they called the Five Cs of Leadership. These are Leadership Capacity, Leadership Character, Leadership Communication, Leadership Collaboration, and Leadership Change. As these constructs constitute the actual application of the instrument in practice, it is the accuracy, or validity, of the instrument to produce measures of the constructs that are of value. Consequently, a confirmatory factor analysis was utilized to assess the validity of the instrument.

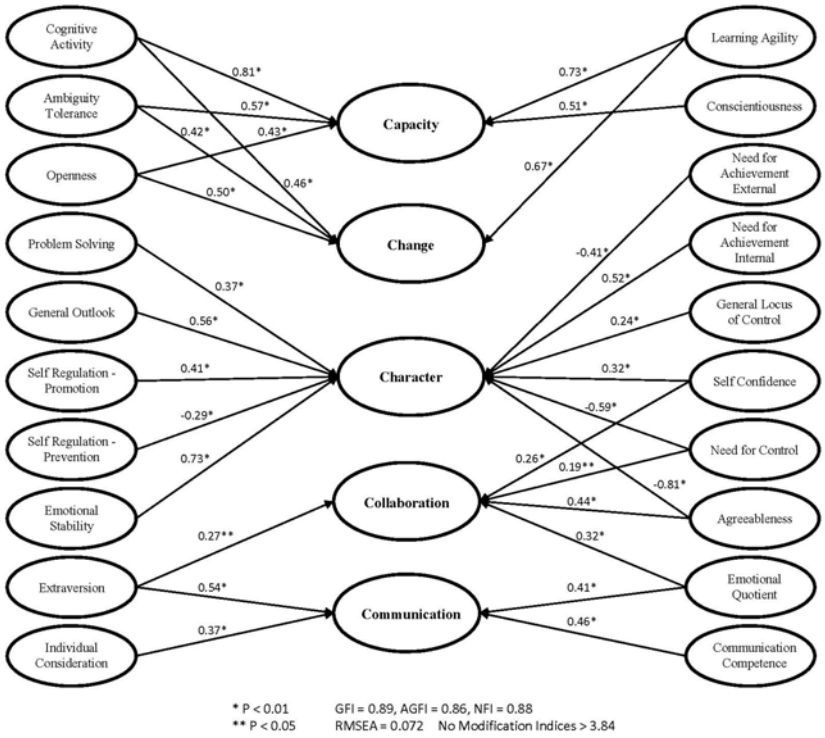
Exploratory factor analysis is inappropriate in this situation, because it seeks to uncover the underlying structure of a set of variables, like the 22 dimensions in this instrument. In this method, one begins with an à priori assumption that any variable may be associated with any factor. One does not have prior theory and one uses the factor loadings to intuit the structure of the data (Kim and Mueller, 1978). In this case, a theoretical foundation was established and the Research Team mapped the dimensions into five factors. Consequently, an identification of the correct approach to Confirmatory factor analysis was indicated which seeks to determine if the number of factors and the loadings of the various measures conform to what the Research Team expected on the basis of its à priori theory (Kline, 1998). The Team selected indicator variables from the 22 dimensions and structured them into five factors on the basis of prior theory. That means that a test is needed as to whether the Team structured the dimensions properly. Confirmatory factor analysis will do this, and it will establish whether the measures mapped into each of the five factors actually belong together. In other words, confirmatory factor analysis will assess how well the proposed model captures the covariance between all the items on the instrument. If the fit is poor, that may imply that some of the items measure multiple factors, or it may imply that some items within one or more of the factors are more related to each other than other items. If the fit is good, it will confirm construct validity. That is, it will confirm that the appropriate variables have been mapped into the appropriate constructs and that the model accurately measures what it purports to measure.

The authors used the approach to confirmatory factor analysis suggested by Nunnally and Bernstein (1994) to test the within and between structural relationships. Figure One displays the outline of the confirmatory factor analysis and presents the goodness of fit measures. The level of fit is high under the Bollen (1989) vote method. Further, the Goodness of Fit Index, the Adjusted Goodness of Fit Index, the RSMEA, and the Chi Square Statistic all demonstrate sufficient fit to confirm construct validity. That is, the model as specified by the Research Team is a valid instrument.

One might note that there are some significant cross-loadings in the confirmatory factor analysis displayed in Figure One. Most important among these are the cross-loadings on Leadership Change. It was concluded that the loadings are appropriate as leading through change is one of the most prominent subjects in all of the management literature (Hofer and Schendel, 1978; Aldrich, 1979; Rumelt, 1986; Lawrence and Lorsch, 1967). In fact, the purpose of much of the strategy literature is to understand and adapt to change (Mintzberg, 1987; Miller and Friesen, 1981). Clearly, the theoretical foundation for the

model recognizes the value of treating leadership change as a separate latent variable, separate from leadership capacity.

Figure One: LCI Confirmatory Factor Analysis



A cross-loading between leadership communication and leadership collaboration was observed, thus it was concluded that the loadings are appropriate. As the Team has defined it, leadership collaboration is clearly a latent construct which is independent from leadership communication. Collaboration is more than building and maintaining relationships; it is feedback enabled and goes to a willingness to effectively share information.

As a further test of construct validity, an examination of convergent and discriminant validity was conducted. Convergent and discriminant validity are subtypes of construct validity. An explanation by Trochim (2006) is instructive: If the measures of a construct which have been theoretically identified as being related to each other are, in fact, observed to be related to each other, then the authors have demonstrated a convergence between similar constructs. Secondly, if the measures of a construct which have been theorized as not related to each other are, in fact, observed to not be related to each other, then the authors have demonstrated a discrimination between dissimilar constructs.

The best approach to testing convergent and discriminant validity remains the Campbell and Fiske (1959) Multi-Trait-Multi-Method approach. This approach requires one to measure the same variables with a completely different approach and then correlates the measures to test conformity between the different methods with different traits and approaches. A sample of 783 executives from 31 industries was utilized. The sample ranged in age from 33 to 71 and averaged 23 years of industry experience. As before, the sample was convenience based, but the central limit theorem (Tijms, 2004) suggests that, due to the sample size, the level of confidence of this sample approaches that of a random sample. As before, the authors believe that this establishes a high level of confidence such that the findings can be extrapolated in this study to the broader universe of all executives.

To execute the Multi-Trait-Multi-Method approach, the authors administered the *Leadership Capability Indicator* to the sample of executives. This constituted the first method of measurement. Secondly, detailed interviews with each participant across all 22 of the dimensions were conducted. Patton's (1990) "conversation with a purpose" approach was utilized to collect data on each of the executives. A Delphi Process was subsequently employed to create scaled ratings of each dimension for each executive. The details of the process are outlined in the following steps.

1. The authors recorded, then transcribed the responses of each Executive to the 22 conversational questions related to the dimensions. Then they analyzed the transcriptions using *Ethnograph 5.0*, a program specifically designed for purposes of content analysis. *Ethnograph 5.0* reports frequencies of words and word phrases, and these frequencies are used to identify patterns in the responses provided by participants.

2. The results provided by the *Ethnograph 5.0* program were discussed in detail with a panel of three Industrial Psychology/Organizational Behavior Ph.D. students who were trained in methods of content analysis and the use of the Delphi technique. Panel members, who were blind to the identity of the executives and did not know whether they were high or mid level executives, then met and rated all 22 dimensions for the 783 executives. The ratings were dependent on the emphasis of the dimension on the interaction, how often particular word or word patterns were found, and how they were used in the responses. The ratings were made on 10 point scales.

3. The findings of the *Ethnograph 5.0* assessment were utilized in conjunction with the deliberations by panel members to produce a score for each participating executive on each of the 22 indicators. Following the process outlined by the Campbell and Fiske (1959) Multi-Trait-Multi-Method, these scores were correlated with the 22 dimensional measures which resulted from the administration of the *Leadership Capability Indicator*.

4. The Multi-Trait-Multi-Method matrix which resulted from the work is displayed in Table Four. An examination of the findings in the Table shows that the 22 *Leadership Capability Indicator* measures and the 22 Interview measures are highly and significantly correlated with each other, demonstrating convergent validity. The correlations ranged from 0.38 to 0.83 with all correlations significant at the 0.01 probability level. Further, the Table shows little to no

significant correlations between the measures that were not theorized to correlate, demonstrating discriminant validity.

Table Four: Leadership Capability Indicator Multi-Trait Multi-Method Matrix	
Instrument Dimensions	**Correlation to Delphi Interview Measures**
Cognitive Activity	0.76*
Learning Agility	0.54*
Ambiguity Tolerance	0.63*
Self Regulation - Prevention	0.77*
Self Regulation - Promotion	0.79*
General Outlook	0.69*
Emotional Quotient/Self Awareness	0.67*
Self Confidence	0.52*
Individual Consideration	0.63*
Locus of Control	0.59*
Need for Control	0.83*
Need for Achievement – External	0.71*
Need for Achievement – Internal	0.76*
Problem Solving	0.65*
Support Seeking	0.51*
Problem Avoidance	0.47*
Communication Competence	0.38*
Emotional Stability	0.81*
Extraversion	0.74*
Openness	0.68*
Agreeableness	0.79*
Conscientiousness	0.81*
* $p < 0.01$	

Next the authors performed the final test of validity: predictive validity. Nunnally and Bernstein (1994) and Cohen, Cohen, West, and Aiken (2003) make it clear that effective prediction is predicated on two key factors. First, is the creation of a fully specified model of normal, reliable, and valid measures. Secondly, is a sufficient understanding and norms for those measures to establish a prescriptive understanding of the implications of prediction which the measure purports to make. The previous reliability and validity testing satisfies the first requirement.

In essence, if the *System* which is being tested does in fact achieve its stated objective, then the performance of subject executives should improve and the financial performance of the organizations for which they work should improve. Consequently, the authors focused their efforts on testing whether such improvements did, in fact, occur.

The sample of 783 executives which was described in the previous section was utilized. Each of these executives had actually been a subject of application of the System, and each had either been selected as a result of the utilization of the *System* or had been involved in training and executive development efforts supported by the *System* which were targeted at improving his or her performance. The authors identified a large number of executives to whom these 783 subjects reported or who reported to them, and asked these executives to participate in the study. A total of 3,289 executives participated in the study, and a ninety minute interview with each of those executives was conducted. The purpose of the interview was to determine how each executive perceived the subject to be performing with regard to each of the 45 leadership competencies identified in the *Leadership Success Profile*. This was an extensive and exhaustive process, which also followed the Patton (1990) "conversation with a purpose" approach, followed by application of the Delphi technique. The details of the process are outlined in the following steps.

1. The authors developed 45 conversational questions which related to the 45 leadership competencies. They then asked these questions of multiple direct report informants, an average of three for each subject, and recorded and transcribed their answers. The authors analyzed the transcriptions by *Ethnograph 5.0*.

2. The results provided by the *Ethnograph 5.0* program were then discussed in detail by a panel of three Industrial Psychology/Organizational Behavior Ph.D. students who were trained in methods of content analysis and use of the Delphi technique. Again, panel members were blind to the identity of the executives and did not know whether they were high or mid level executives. The panel members met and rated each dimension for each of the 45 leadership competencies for each of the 783 subject executives. The ratings were dependent on the emphasis of the dimension on the interaction, how often particular word or word patterns were found, and how they were used in the responses. The ratings were made on 10 point scales.

3. The authors used the findings of the *Ethnograph 5.0* assessment in conjunction with the deliberations by panel members to produce a score for each participating executive on each of the 45 leadership competencies. If, in fact, the System had been successful as a screening or training device, then the original 22 ratings resulting from the application of the *Leadership Capability Indicator* should predict the results of the 45 leadership competency scores. To test that point, regression analyses were conducted using the leadership competency scores as dependent variables, and the 22 dimensional ratings as independent variables for each subject executive.

   Regression analysis is widely used for prediction, but is also used to understand which among the independent variables are related to the dependent variable. It can also be used to infer causal relationships between the independent and dependent variables (Berk, 2004). In the application, the authors intended to test whether the application of the System has influenced the

perceptions of performance of the direct report executives. Specifically, they wanted to examine the impact of the System. Impact factors are defined by Cohen and Cohen (1983) as the effect of a particular individual predictor variable or set of predictor variables on a chosen predicted variable.

The control variables which were included in the analysis were age, industry experience, functional experience, and gender. In addition, the authors collected performance appraisal data on all 783 executives in the sample. This data was included as an additional dependent variable in the regression analysis. Finally, the authors created a leadership balance index based on the *Context Based 360° Leadership Assessment* for each executive. The authors utilized the *c360° Index* as a final independent variable.

4. The outcomes of the 45 regressions are presented as impact factor ranges in Table Five. Because of the large number of regressions, the authors have presented ranges of impact factors for the 45 regressions. The impact factors demonstrate a highly predictive linkage between the instrument and perception of leadership capability. There was a strong and statistically significant relationship with performance appraisal, as the R^2 was 0.32 and the adjusted R^2 was 0.25. Finally, the analysis showed a strong and statistically significant relationship with the *360° Index*, as the R^2 was 0.54 and the adjusted R^2 was 0.42. The authors concluded that the *Leadership Capability Indicator* has predictive validity.

Table Five: Leadership Capability Indicator Dimensions Regressed Against Delphi Based Measures of Success Profile Leadership Competencies

Success Profile Leadership Competencies	Impact Factor Ranges 22 LCI Dimensions
Able to effectively confront Direct Reports	0.08 to 0.33
Action Oriented	0.11 to 0.41
Approachable and Warm	0.06 to 0.24
Challenges the Status Quo	0.12 to 0.37
Composed in Pressure Situations	0.09 to 0.31
Creative	0.11 to 0.44
Deals well with Paradox	0.07 to 0.29
Delegates Effectively	0.13 to 0.51
Develops Subordinates	0.07 to 0.25
Is effective at giving orders	0.15 to 0.36
Effective at Managing Innovation	0.11 to 0.39
Effective Communicator	0.12 to 0.23
Effective Listener	0.07 to 0.35
Effective Negotiator	0.04 to 0.21
Effective Planner	0.15 to 0.44

Table Five: Leadership Capability Indicator Dimensions Regressed Against Delphi Based Measures of Success Profile Leadership Competencies	
Success Profile Leadership Competencies	**Impact Factor Ranges 22 LCI Dimensions**
Effective Presentation Skills	0.11 to 0.29
Effective Team Builder	0.12 to 0.43
Effective Time Manager	0.14 to 0.37
Effectively Sets Priorities	0.17 to 0.46
Effectively Solves Problems	0.14 to 0.33
Focused on Customers	0.08 to 0.21
Goal Oriented	0.14 to 0.29
Great at Motivating Others	0.07 to 0.32
Has Work and Life in Balance	0.04 to 0.19
High Levels of Integrity and Trust	0.05 to 0.16
Inspirational	0.09 to 0.27
Interpersonally Savvy	0.11 to 0.31
Is Compassionate	0.08 to 0.27
Learns on the Fly	0.12 to 0.44
Makes Decisions When They Need to be Made	0.09 to 0.28
Managerial Courage	0.14 to 0.39
Manages Conflict Well	0.08 to 0.34
Manages Organizational Vision and Purpose	0.04 to 0.27
Manages Up Well	0.06 to 0.23
Perseveres through Difficult Times	0.11 to 0.37
Politically Savvy	0.07 to 0.19
Reads People Well	0.10 to 0.28
Rewards People Effectively	0.05 to 0.27
Self Confident	0.06 to 0.39
Smart	0.08 to 0.33
Tolerates Ambiguity	0.05 to 0.42
Understands the Business	0.17 to 0.31
Very Organized	0.06 to 0.26
Very Patient	0.11 to 0.24
Visionary	0.06 to 0.31
Using age, gender, and industry experience as control variables N=783 990 Total Regressions	

The authors have applied established empirical evaluation methodologies to the *Leadership Capability Indicator* in the evaluation of reliability and validity. A test of predictive validity, which is often omitted in empirical evaluations of such instruments, was conducted. The findings to this point are that the *Leadership Capability Indicator* is a reliable and valid instrument.

Theoretical Foundation, Reliability and Validity of the Context Based 360° Leadership Assessment

The Research Team designed the *c360°* to be an instrument of leadership balance. Leadership Balance is based on Fiedler's (1966 & 1971) Contingency Theory of Leadership, and the Situational Leadership Theory developed by Kerr and Jermier (1978). The essence of these leadership theories is principally that leaders have to read and understand their direct reports and execute leader behaviors at a level which will be most motivating for the group. While this perspective may appear simplistic, leadership is an extremely complex phenomenon. Yukl (1999) was insistent that Transformational Leadership, a form of leadership on which many leadership assessment instruments are based, has a series of conceptual and practical weaknesses. Consequently, the practice of Transformational Leadership alone, is not likely to be adequate to establish a high level of leadership capability in the modern world. Jaques and Clement (1991) argued that managing in more complex and difficult environments required leadership to be fully multi-dimensional. Schein (2004) indicated that it takes a range of leadership styles to maintain and drive effective organizational cultures.

As a result of its review of the foregoing and other research streams, the Team decided to expand its instrument to establish an understanding of an individual's ability to apply Directive, Transactional, Transformational and Empowering leader behaviors in his or her particular leadership role in a given organization. Pearce, Sims, Cox, Ball, Schnell, Smith and Trevino (2003) present a detailed conversation about these various leader behaviors. The Team developed a series of measures based on refinements of the scales of Pearce and Sims (2002) and Cox and Sims (1996). Edwards (2008) demonstrated the power of such comparative or fit based approaches but argued that traditional difference scores have a range of methodological challenges. Consequently, the Team configured the measures to comply with the Edwards' perspective.

Leadership balance, as viewed by the Team in its development of this instrument, is largely a broad measure of leadership fit. That is, not only does one need to understand how an individual perceives his or her execution of the various leader behaviors, one needs to know whether the direct reports of that individual feel that the execution fits their needs and circumstances. Consequently, the instrument includes evaluation of the needs of direct reports and the influence potential for each of the four leadership styles (Pearce and Sims, 2002; Ensley, Pearce and Hmieleski, 2006).

The Team identified 16 specific leader behaviors which are mapped to the four leadership styles. The perspective of the System is that leadership balance is evidenced by the appropriate use of all four leadership styles, and that all 16 leader behaviors fit the context in which the leader works. The instrument avoids interpretive assumptions by creating performance and influence scores for each subject. Performance scores indicate the *use* of leadership style or behavior on the part of a particular leader, and influence scores indicate the *need* which a particular set of followers has for that particular leader behavior. Leadership balance is then presented as the fit between what leadership is required by a

particular set of direct reports and the extent to which the leader executes those leader behaviors effectively.

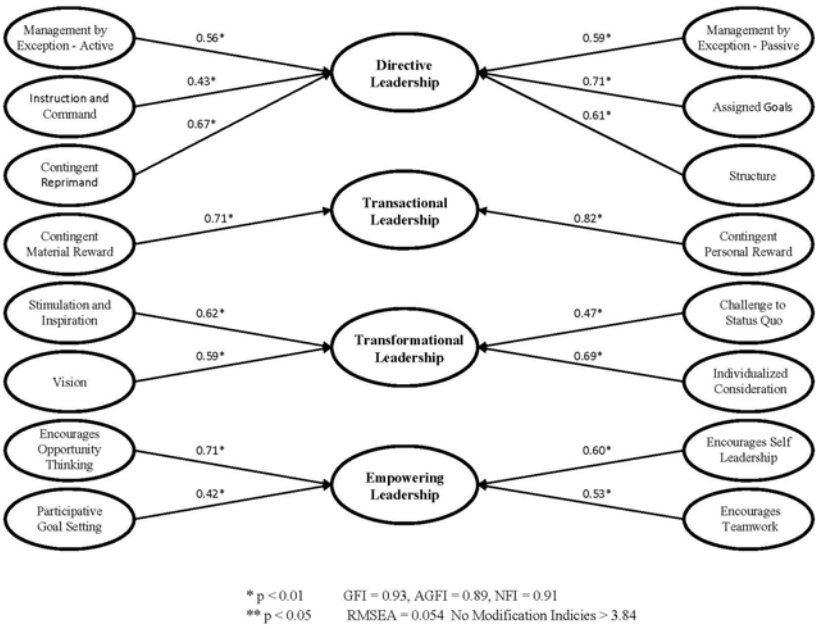
Table Six: Reliability Test Results for the Context Based 360 Leadership Assessment			
c360 Dimension	**Cronbach's Alpha**	**Split Half**	**Test Retest**
Management by Exception – Active	0.73	0.88	0.54
Management by Exception – Passive	0.79	0.81	0.57
Instruction and Command	0.81	0.75	0.49
Assigned Goals	0.87	0.79	0.71
Contingent Reprimand	0.76	0.71	0.59
Structure	0.91	0.84	0.73
Contingent Personal Reward	0.83	0.77	0.53
Contingent Material Reward	0.76	0.81	0.44
Stimulation and Inspiration	0.66	0.74	0.56
Vision	0.85	0.79	0.74
Challenge to Status Quo	0.79	0.86	0.70
Individualized Consideration	0.89	0.82	0.68
Encourages Opportunity Thinking	0.73	0.66	0.55
Encourages Self Leadership	0.86	0.77	0.71
Participative Goal Setting	0.81	0.69	0.47
Encourages Teamwork	0.77	0.81	0.57
Invective Leadership	0.89	0.83	0.61
Active Resistance	0.86	0.75	0.65
Negotiation	0.91	0.83	0.77

As before, the authors began the assessment of reliability with tests of Internal Consistency, Split Half, and Test-Retest. The same sample was used to test reliability for the *Leadership Capability Indicator*. Table Six outlines the findings of the reliability analysis across all 16 dimensions of the instrument. Internal consistency measures using Cronbach's Alpha ranged from 0.73 to 0.91 across the 16 dimensions. The split half reliability range was 0.66 to 0.88 across the 16 dimensions. The test-retest reliability at 24 months ranged from 0.44 to 0.77 across the 16 dimensions. All of these factors indicate a high level of reliability.

As discussed in the assessment of the *Leadership Capability Indicator*, it was determined that the mapping of the 16 dimensions in the four leadership styles suggested that the most appropriate assessment tool would be confirmatory factor analysis. Consequently, that analysis and the findings are displayed in Figure Two. As before, the approach suggested by Nunnally and Bernstein (1994) was utilized to demonstrate that the model has sufficient within and between statistical structure to consider that the authors have established construct validity. The level of fit using Bollen's (1989) vote method is high.

The Goodness of Fit Index, Adjusted Goodness of Fit Index, RSMEA, and Chi Square all demonstrate sufficient fit to confirm construct validity.

Figure Two: c360 Confirmatory Factor Analysis



As before, this examination was followed with a test of convergent and discriminant validity. The Campbell and Fiske's (1959) Multi-Trait-Multi-Method approach, which requires the measurement of the same variables with a completely different approach and then correlates the measures to test conformity between the different methods with different traits and approaches was utilized. The authors used a sample of 598 executives from 27 industries. The sample ranged in age from 31 to 63 and averaged 19 years of industry experience. As before, the sample was convenience based, but the central limit theorem (Tijms, 2004) suggests that, due to the sample size, the level of confidence of this sample approaches that of a random sample. As before, the authors believe that this establishes a high level of confidence and that the findings can be extrapolated to the broader universe of all executives.

To execute the Multi-Trait-Multi-Method approach, the authors administered the *c360°* to each of the subjects and to each of the superiors, subordinates and peers of each subject executive. This constituted the first method of measurement. Secondly, detailed interviews were conducted with each

participant across all 16 of the dimensions. The authors used Patton's (1990) "conversation with a purpose" approach to collect data on each of the executives. A Delphi Process was subsequently employed to create scaled ratings of each dimension for each executive. The details of the process are outlined in the following steps:

1. The authors recorded, then transcribed the responses of each Executive to the 16 conversational questions related to the dimensions. Counting the subjects, their superiors, peers and subordinates, the authors completed 3,708 one hour interviews. The authors concentrated on understanding the extent to which each particular leader behavior was executed and the extent to which that behavior was influential. As before, the transcriptions using *Ethnograph 5.0* were analyzed. *Ethnograph 5.0* reports the frequencies of words and word phrases, and these frequencies are used to identify patterns in the responses provided by participants.

2. The authors discussed the results provided by the *Ethnograph 5.0* program in detail with a panel of three Industrial Psychology/Organizational Behavior Ph.D. students who were trained in methods of content analysis and the use of the Delphi technique. Panel members, who were blind to the identity of the executives and did not know whether they were high or mid level executives, then met and rated all 16 dimensions for the 598 executives. The ratings were dependent on the emphasis of the dimension on the interaction, how often particular word or word patterns were found, and how they were used in the responses. The ratings were made on 10 point scales.

3. The authors used the findings of the *Ethnograph 5.0* assessment in conjunction with the deliberations by panel members to produce a score for each participating executive on each of the 16 indicators. Following the process outlined by the Campbell and Fiske (1959) Multi-Trait-Multi-Method, the authors correlated these scores with the 16 dimensional measures which resulted from the administration of the *c360°*.

4. The Multi-Trait-Multi-Method matrix which resulted from this work is displayed in Table Seven. An examination of the findings in the Table shows that the 16 *c360°* measures and the 16 Interview measures are highly and significantly correlated with each other, demonstrating convergent validity. The correlations ranged from 0.63 to 0.92 with all correlations significant at the 0.01 probability level. Further, there was little to no significant correlations between the measures that were not theorized to correlate, demonstrating discriminant validity.

Table Seven: Context Based 360 Leadership Assessment Multi-Trait Multi Method Matrix

c360 Dimension	**Correlation to c360 Delphi Based Interview Measures**
Management by Exception – Active	0.81*
Management by Exception - Passive	0.76*
Instruction and Command	0.87*

Table Seven: Context Based 360 Leadership Assessment Multi-Trait Multi Method Matrix	
c360 Dimension	**Correlation to c360 Delphi Based Interview Measures**
Assigned Goals	0.91*
Contingent Reprimand	0.75*
Structure	0.71*
Contingent Personal Reward	0.79*
Contingent Material Reward	0.84*
Stimulation and Inspiration	0.71*
Vision	0.78*
Challenge to Status Quo	0.63*
Individualized Consideration	0.90*
Encourages Opportunity Thinking	0.77*
Encourages Self Leadership	0.82*
Participative Goal Setting	0.71*
Encourages Teamwork	0.89*
Invective Leadership	0.92*
Active Resistance	0.72*
Negotiation	0.83*
* $p < 0.01$	

As before, the authors now turned to a test of predictive validity. The sample of 598 executives described in the previous section were utilized. Each of these executives had actually been a subject of application of the *System*, and each had been involved in training and executive development efforts supported by the System, which was targeted at improving his or her performance. The authors identified a large number of executives to whom these 598 subjects reported or who reported to them, and asked these executives to participate in the study. A total of 1,908 executives participated in the study, and the authors conducted a sixty minute interview with each of those executives. The purpose of the interview was to determine how each executive perceived the subject to be performing with regard to each of the 45 leadership competencies identified in the *Leadership Success Profile*. This was an extensive and exhaustive process, which also followed the Patton (1990) "conversation with a purpose" approach, followed by application of the Delphi technique. The details of the process are outlined in the following steps.

1. The authors developed 45 conversational questions which related to the 45 leadership competencies. They then asked these questions of multiple direct report informants, an average of three for each subject, and recorded and transcribed their answers. The transcriptions by *Ethnograph 5.0* were analyzed.

2. The results provided by the *Ethnograph 5.0* program were then discussed in detail by the panel of three Industrial Psychology/Organizational Behavior Ph.D. students who were trained in methods of content analysis and use of the Delphi technique. Again, panel members were blind to the identity of the executives and did not know whether they were high or mid level executives. The panel members met and rated each dimension for each of the 45 leadership competencies for each of the 598 subject executives. The ratings were dependent on the emphasis of the dimension on the interaction, how often particular word or word patterns were found, and how they were used in the responses. The ratings were made on 10 point scales.

3. The authors used the findings of the *Ethnograph 5.0* assessment in conjunction with the deliberations by panel members to produce a score for each participating executive on each of the 45 leadership competencies. If, in fact, the System had been successful as a training device, then the original 16 ratings resulting from the application of the *c360°* should predict the results of the 45 leadership competency scores. To test that point, regression analyses were conducted using the leadership competency scores as dependent variables, and the 16 dimensional ratings as independent variables for each subject executive.

   The control variables included in the analysis were age, industry experience, functional experience, and gender. In addition, performance appraisal data on all 598 executives in the sample were collected. This data was included as an additional dependent variable in the regression analysis. Finally, a leadership balance index based on the *Context Based 360° Leadership Assessment* for each executive was created. As discussed in preceding sections, the *c360°* produces an assessment of each of four leader behaviors. The authors utilized the 16 measures which are mapped into those four behaviors to produce a single score of leadership balance. Recognizing that the purpose of the instrument is to evaluate an individual's delivery of each behavior in an intensity which fits his or her organizational situation, the authors combined the scores into a single index number, which is called the *c360° Index*. The *c360°* Index was utilized as a final independent variable.

4. The outcomes of the 45 regressions are presented as impact factor ranges (Cohen and Cohen, 1983) in Table Eight. Because of the large number of regressions, the authors have presented ranges of impact factors for the 45 regressions. The impact factors demonstrate a highly predictive linkage between the instrument and perception of leadership capability. There was a strong and statistically significant relationship with performance appraisal, as the R^2 was 0.37 and the adjusted R^2 was 0.29. Finally, the analysis showed a strong and statistically significant relationship with the *c360° Index*. The authors concluded that the *Context Based 360° Leadership Assessment* has predictive validity.

Table Eight: c360° Dimensions Regressed against Delphi Leadership Competency Measures

Success Profile Leadership Competencies	Impact Factor Ranges on 16 c360° Dimensions
Able to effectively confront Direct Reports	0.11 to 0.43
Action Oriented	0.08 to 0.48

Table Eight: c360° Dimensions Regressed against Delphi Leadership Competency Measures	
Success Profile Leadership Competencies	**Impact Factor Ranges on 16 c360° Dimensions**
Approachable and Warm	0.05 to 0.24
Challenges the Status Quo	0.12 to 0.37
Composed in Pressure Situations	0.08 to 0.29
Creative	0.07 to 0.21
Deals well with Paradox	0.13 to 0.33
Delegates Effectively	0.06 to 0.41
Develops Subordinates	0.09 to 0.27
Is effective at giving orders	0.16 to 0.44
Effective at Managing Innovation	0.04 to 0.25
Effective Communicator	0.07 to 0.21
Effective Listener	0.10 to 0.29
Effective Negotiator	0.14 to 0.40
Effective Planner	0.06 to 0.53
Effective Presentation Skills	0.12 to 0.26
Effective Team Builder	0.16 to 0.44
Effective Time Manager	0.06 to 0.27
Effectively Sets Priorities	0.09 to 0.31
Effectively Solves Problems	0.05 to 0.27
Focused on Customers	0.03 to 0.19
Goal Oriented	0.08 to 0.26
Great at Motivating Others	0.05 to 0.34
Has Work and Life in Balance	0.09 to 0.17
High Levels of Integrity and Trust	0.04 to 0.16
Inspirational	0.11 to 0.26
Interpersonally Savvy	0.08 to 0.19
Is Compassionate	0.05 to 0.28
Learns on the Fly	0.14 to 0.36
Makes Decisions When They Need to be Made	0.11 to 0.41
Managerial Courage	0.06 to 0.47
Manages Conflict Well	0.11 to 0.20
Manages Organizational Vision and Purpose	0.07 to 0.39
Manages Up Well	0.05 to 0.18
Perseveres through Difficult Times	0.11 to 0.26
Politically Savvy	0.08 to 0.21

Table Eight: c360° Dimensions Regressed against Delphi Leadership Competency Measures	
Success Profile Leadership Competencies	**Impact Factor Ranges on 16 c360° Dimensions**
Reads People Well	0.07 to 0.17
Rewards People Effectively	0.09 to 0.23
Self Confident	0.12 to 0.31
Smart	0.14 to 0.29
Tolerates Ambiguity	0.08 to 0.34
Understands the Business	0.16 to 0.41
Very Organized	0.07 to 0.27
Very Patient	0.11 to 0.21
Visionary	0.09 to 0.34
Using Age, Gender, and Industry Experience as Control Variables N=598 720 Total Regressions	

The authors have applied established empirical evaluation methodologies to the *c360°* in the evaluation of reliability and validity. The authors have included a test of predictive validity, which is often omitted in empirical evaluations of such instruments. The findings to this point are that the *c360°* is a reliable and valid instrument.

Theoretical Foundation, Reliability and Validity of the Talent Director

The purpose of the *Talent Director* is to create a way to take the findings of the initial three modules of the *Talent Management System* and present that data in a way that is easy to use in practical settings. To that end, the Research Team designed a graphical interface that uses the outcomes of the *Leadership Success Profile* to prioritize a series of graphical representations of the *Leadership Capability Indicator* and the *Context Based 360° Leadership Assessment* measures, along the lines of the interaction analysis and graphing described by Cohen, Cohen, West, and Aiken (2003) . The precise algorithms that the Research Team employs to produce the prioritization of the *Talent Director* graphs are maintained as a Trade Secret. The Research Team reports that it used a global set of predictive models.

Despite the absence of the linking algorithms, it is clear that a test of the efficacy of the *Talent Director* would involve an assessment of the impact factors. As defined by Cohen and Cohen (1983), an impact factor is the effect of a particular individual predictor variable or set of predictor variables on a chosen predicted variable. If the *Talent Director* produces results which are reliable and valid, those results should have strong impact scores. Using the sample of 598 executives described in the preceding section, the authors calculated the impact factors for each of the 45 leadership competencies identified in the *Leadership Success Profile*. The results are displayed in Table Nine. As before, the specific beta weights from each of the models are not presented as they are the foundation of the algorithms that drive the prioritization of the graphs and are viewed as intellectual property by the Executive Assessment

Institute. As the Table shows, the impact factors are strong and statistically significant. The authors concluded that the *Talent Director* has a high level of reliability and validity.

Table Nine: Delphi Based – Success Profile Leader Competency Measures Regressed against LCI 5-C and c360° Leadership Style Measures	
Success Profile Leadership Competencies	**Adjusted R^2**
Able to effectively confront Direct Reports	0.68*
Action Oriented	0.57*
Approachable and Warm	0.39*
Challenges the Status Quo	0.63*
Composed in Pressure Situations	0.51*
Creative	0.36*
Deals well with Paradox	0.52*
Delegates Effectively	0.47*
Develops Subordinates	0.40*
Is effective at giving orders	0.60*
Effective at Managing Innovation	0.44*
Effective Communicator	0.31*
Effective Listener	0.36*
Effective Negotiator	0.29*
Effective Planner	0.42*
Effective Presentation Skills	0.21*
Effective Team Builder	0.47*
Effective Time Manager	0.27*
Effectively Sets Priorities	0.33*
Effectively Solves Problems	0.59*
Focused on Customers	0.35*
Goal Oriented	0.31*
Great at Motivating Others	0.47*
Has Work and Life in Balance	0.19*
High Levels of Integrity and Trust	0.39*
Inspirational	0.51*
Interpersonally Savvy	0.43*
Is Compassionate	0.17*
Learns on the Fly	0.57*
Makes Decisions When They Need to be Made	0.41*
Managerial Courage	0.38*

Table Nine: Delphi Based – Success Profile Leader Competency Measures Regressed against LCI 5-C and c360° Leadership Style Measures	
Success Profile Leadership Competencies	**Adjusted R^2**
Manages Conflict Well	0.29*
Manages Organizational Vision and Purpose	0.45*
Manages Up Well	0.16**
Perseveres through Difficult Times	0.32*
Politically Savvy	0.26*
Reads People Well	0.34*
Rewards People Effectively	0.23*
Self Confident	0.31*
Smart	0.46*
Tolerates Ambiguity	0.37*
Understands the Business	0.56*
Very Organized	0.31*
Very Patient	0.19*
Visionary	0.33*

Using Age, Gender, and Industry Experience as Control Variables.
N=598
* $p < 0.01$
** $p < 0.05$

Conclusion

The *Talent Management System* developed by the Research Team of the Executive Assessment Institute is a broad and deep instrument. It is administered only by trained and certified agents. The various components are far reaching in applicability and surprisingly direct in interpretation. The authors have employed a vast number of test subjects and employed well established and broadly accepted empirical assessment tools to evaluate the reliability and validity of this collection of instruments and tools. The component instruments have performed well in every test to which they have been subjected. Consequently, the System appears to be statistically robust, reliable and valid.

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SMALL FIRM STRATEGY IN TURBULENT TIMES

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ABSTRACT

The purpose of this paper is to suggest an approach to modifying firm strategy and tactics to cope with the demands of the current economic downturn and resulting challenges to profitability and growth. The approach is, broadly, becoming a focused differentiator, adopting Hersey's Situational leadership Model and adopting a Lean Management philosophy.

The target audience for this paper is Small and Medium Sized Enterprises (SMEs) - frequently privately held and often with fewer than 100 employees. These firms, in most cases, do not have sufficient resources to hire traditional management consulting firms but the reality is that what is described herein can be learned and applied at a very low cost.

This paper benefits from the work we have done with Jay Arthur (LifeStar) and Warren Miller (Beckmill Research). In the aggregate we have well over 75 years of experience working with and advising SMEs. We don't claim to be strategy experts but we have over the years seen the mistakes made by SMEs and we'd like to help you avoid some of those mistakes.

INTRODUCTION

Triggered by the burst of the housing bubble in late 2007, the United States entered the worst recession since the 1930s. Unemployment is currently at a twenty seven year high. Erosion of revenue and profits has plagued many firms and the very structure of a variety of industries has been impacted. The old strategy approach of positioning a firm within its industry is no longer completely adequate because of profound structural changes in many industries. What is needed for survival and some measure of success in a small firm is the appropriate positioning of the firm and an emphasis on operations excellence (Porter, 1996) under the guidance of Situational Leadership® (Hersey, 1997).

One definition of strategy is "A plan of action resulting from strategy or intended to accomplish a specific goal" (American Heritage, 1993). This general definition alludes to an important point and that is that the purpose of strategy is to accomplish an important goal or goals. The word "strategy" has as its root the Greek word "strategos" and that word is loosely translated in English (from Greek) as "the art of the generals". One of the first books describing the formulation and implementation of strategy was Sun Tzu's classic "The Art of Strategy" published some time during the Warring States Period (480-221 BC) (Wing, 1998). The Art of Strategy is really a series of tactical recommendations for conducting war. Although somewhat dated, it is interesting to note that this book is used as a strategy text at hundreds of schools around the world including the US Army's Command and General Staff College at Fort Leavenworth, Kansas.

It is difficult to estimate how many books, articles and monographs have been published about strategy over the last 2500 years, but it is safe to say that the number is well into the thousands. In "Strategy Safari", written by Mintzberg, Allstrand and Lampel in 1998, the authors comment that they

reviewed more than 2000 published studies on strategic management. Most of the published work on strategic management addresses the strategy problems (opportunities?) facing larger organizations. This is appropriate from a pedagogical perspective but it is not always helpful to the very small organizations that populate the business landscape. According to the Bureau of the Census, in 2002 more than 97% of all business firms in the United States had fewer than 100 employees. It is to the leaders and employees of these very small firms that this paper is addressed. Although some would argue that very small firms (fewer than 100 employees) don't really need to concern themselves with strategy as normally understood, I disagree - vehemently. If one "buys" the fundamental assumption that there is an important relationship between strategy and firm performance, then it's obvious that small firms need effective strategic management as much as large firms.

STRATEGY AND TACTICS

Pick up any strategic management textbook and you will find that strategy, in its most general sense, is visualized as a series of decisions resulting in plans that must be implemented to achieve whatever the organization's goals are. Many authors suggest that the starting point for the process is the articulation of a vision statement. Presumably, a vision statement defines, in fairly general terms, where the business organization wants to go in the future. In other words, the vision defines (loosely, in most cases) expectations regarding future markets to be served, products or services to be developed and some idea about the target customers.

Related to the vision is the idea of a mission statement. A mission is an articulation of what the company does currently in terms of products and services, markets and customers served. Some authors (and experts) see the vision and mission statements as "two sides of the same coin" and others see the vision and mission as distinct and quite different. The distinction is fairly unimportant from the small firm perspective.

I ascribe to a slightly different viewpoint regarding prescriptions about how to "do" strategy in a small organization. Jack Welch, in his recent book "Winning", talks about starting strategic management with a very careful decision about what he calls the "Big Aha" - a smart, realistic, relatively fast way to gain a competitive advantage (Welch, 2005). There are two fundamentally important considerations in this straightforward recommendation - the time dimension and something called competitive advantage. The time dimension is important and becoming more so all the time. Consider that Tom Peters in his groundbreaking book - "Thriving on Chaos" - back in 1988 talked about the critical importance of hustle. Successful firms tend to "out hustle" less successful firms in their industries by considerable margins. And this doesn't mean just compressing the delivery cycle. It means substantively shortening the time required to perform most operations - order placement, conflict resolution, billing, customer responses and new product development.

A competitive advantage means, essentially, what the label suggests - valuable and rare core competencies (Thompson, Strickland & Gamble, 2010). Core competencies that lead to significant competitive advantage are valuable, rare, difficult to imitate and essentially non substitutable. They are the things that we do that other firms with whom we compete are unable to do. Competitive advantages differ appreciably by industry but we illustrate the concept with the following examples - Honda and internal combustion engine design, Southwest Airlines and ticket pricing, Proctor and Gamble and

distribution of food products and the many smaller firms that thrive in highly competitive markets because they are better, faster or cheaper than their rivals.

Developing a competitive advantage, according to Porter (1980), means deciding to compete on the basis of low cost or differentiation. A low cost strategy generally means that facilities are large, production runs are long, controls are very tight, high degrees of automation are frequently employed and the major "focus" of the firm is to achieve the lowest costs in the industry in which it participates. An example of a low cost leadership strategy in retailing is obviously Wal*Mart. Toyota is an example of a manufacturing firm that achieves a low cost strategy by employing the Toyota Production System (Womack, Jones & Roos, 1990; Womack & Jones, 1996).

Differentiation is, in some ways, almost the opposite of low cost leadership. Differentiators carefully study their customers and potential customers to identify what special features, options and alternatives people are willing to pay competitive prices for. They then focus on providing these unique bundles of products and services which are generally sold in smaller volumes at higher margins. It is our position that the appropriate generic strategy for small firms is, almost always, focused differentiation. Small firms generally don't have sufficient resources - money, people or facilities - to compete on the basis of a low cost leadership strategy. As Tom Peters has said, "Don't try to compete with Wal*Mart on price or China on cost. (Peters, 2007).

One way to think about differentiation is to attempt to become a Purple Cow (Godin, 2003). Godin notes that the old "TV-Industrial complex" is no longer adequate in many industries. Firms - particularly SMEs -- need to transform their businesses by becoming remarkable. Think, if you will, of firms like early Starbucks, Jet Blue, Southwest Airlines, Outback Steakhouse and the new Volkswagen Beetle. These products and firms addressed a niche market and understood the customer's value propositions. They were very successful focused differentiators.

TACTICS

Once a conscious decision has been made to be a Focused Differentiator, the question then becomes, "How do we implement?" In this paper, we argue that Operations and the care and feeding of human resources are the critical functions that must be addressed. Operations, of course, are the conversion of inputs to outputs. Many real world examples of operations excellence are well-known - Toyota, Nucor Steel, Southwest Airlines and Springfield Remanufacturing Corporation (SRC).

Toyota (despite its recent difficulties with recalls) has fine tuned its production processes with the Toyota Production System - named Lean Manufacturing by Womack and Jones. Nucor Steel revolutionized basic steel making with continuous casting and became one of the most profitable (and largest) American producers. Southwest Airlines - the only profitable American airline - combines point-to-point route maps, open seating, no meals and one type of aircraft (Boeing 737s). SRC quickly rose to profitability after a leveraged buyout with an 89:1 Debt Equity Ratio by creating the Great Game of Business - Open Book Management. Over the last fifty years hundreds of tactics have been created to enhance productivity and efficiency. Such tactics as Lean Six Sigma, MBWA, TQM, Scenario Planning and a host of other "Best Practices" populate the landscape. What's missing is an organizing framework to implement the Focused Differentiation strategy. To implement, we suggest Situational Leadership® and a Lean Philosophy

SITUATIONAL LEADERSHIP®

It is axiomatic that the "right" leadership is likely associated with above average performance but one of the "knotty" problems lies in attempting to answer the fundamental question, "What kind of leadership?" A recent Google search yielded 138,000,000 "hits" for the term Leadership. Amazon.com currently lists over 59,000 leadership books. Clearly there are a host of competing theories of leadership. Paul Hersey's Situational Leadership (SL) Model ® provides a common-sense answer to that question and has been used by hundreds of the Fortune 500 firms (Hersey 1997). Hersey's Center for Leadership Studies in Escondido, California has taught SL to thousands of managers in three day sessions over the last twenty years.

One of the appeals of the SL Model is that it makes a great deal of intuitive sense. The model proposes that leader behavior should vary along two dimensions - directive behavior (task oriented) and supportive behavior (relationship oriented). The choice of which behavior to adopt should be a function of what Hersey calls follower readiness. Follower readiness ranges from "low" - unable and unwilling or insecure - to "high" - able, willing and confident.

I had personal experience using this model a number of years ago in the steel industry in Texas. We (Riverside Industries) were a manufacturer of galvanized transmission towers in Fort Worth. A substantial majority of our hourly workforce was young Hispanic men from the Rio Grande valley. These young men had grown up working in agriculture. Ten hour days and six day work weeks were common. They were willing to work hard but they were (when they first came to work with us) insecure because they did not have the requisite technical skills to do the job. They were for the most part what Hersey calls Readiness Level 1 and the recommended approach to leadership was "Telling."Over a period of several months they were taught to use basic hand tools and some of the simpler power equipment. This training was "on the job" training and it was, for the most part, conducted by fellow workers under the guidance of first line supervision.

Gradually these workers moved from Readiness Level 1 to Readiness Level 2 where the suggested "style" of leadership is "Selling." This means a heavy emphasis on supportive behavior and less emphasis on task behavior. Eventually, some of the workers at Readiness Level 2 moved to Readiness Level 3 where the emphasis should be (according to Hersey) on sharing ideas and facilitating appropriate decision making. It was from this group of workers that we were able to promote to first line supervision and the results were higher levels of productivity and related profitability.

Tom Peters (2005) proposes that in these crazy and chaotic times many of us have a tendency to fall back on a command-and control style of leadership. He argues that this is ineffective and that we should embrace a model of leadership that is loose, open and innovative - in other words Hersey's "Selling" and "Participating" styles of leadership. These styles of leadership comport well with flatter, decentralized forms of organizations.

One of my former employers - the United States Marine Corps - has moved strongly in this direction. Today we see NCOs and lower-level commissioned officers (Lieutenants and Captains) making decisions that were previously made at much higher levels in the hierarchy. They are doing that because the Corps has adopted the doctrine of maneuver warfare (Santamaria, Martino & Clemens (2004).

One can learn how to "do" Situational Leadership® by reading Hersey's book - The Situational Leaders (Hersey, 1997) but a better approach is to attend the three-day training session at Hersey's Center

for Leadership Studies in Escondido, California. More than ten million managers from over one thousand organizations have attended and have experienced higher levels of productivity and enhanced profitability. As Warren Bennis -eminent management scholar -- says, "Everybody nowadays is searching for excellence. Hersey's intriguing and concise book demonstrates how this can be done."

LEAN PHILOSOPHY

In 1990, James P. Womack, Daniel T. Jones and Daniel Roos published *The Machine that Changed the World*. This New York Times Best Seller described the five- year, $5 million International Motor Vehicle Program (IMVP) at Massachusetts Institute of Technology which began in 1985. This world-wide research study included ninety vehicle assembly plants around the world and over a hundred component supplier plants. The purpose of the study was to determine the characteristics of what came to be known as Lean Manufacturing (LM). The results were mind boggling. Lean firms - particularly Toyota - were able to assemble cars in half the time of their American and European competitors with half the inventory and roughly half the floor space. Quality levels at Toyota (as measured by defects after assembly) were much lower. A Lean philosophy employs five principles: Value, Value Stream, Flow, Pull and Perfection (Womack & Jones, 1996).

Value

It is critically important that a firm give serious consideration to the question of how it creates value for its customers. It is not enough that the firm examine the value proposition from the perspective of the firm. It must also carefully consider what the customers consider valuable. An admittedly simple example follows. I routinely travel from my home in Joplin, MO to Fort Lauderdale, FL. The elapsed time for the flight (through the American Airline hub at Dallas) is approximately 6 hours including a two hour layover in Dallas. The actual trip time is about 9 hours because I have to drive to the Springfield, MO airport to catch a flight to Dallas. In bad weather, the trip can actually stretch to 10-12 hours of elapsed time. With the all-too-frequent flight cancellations on American Airlines, this frustrating itinerary can become an overnight experience. Granted, American's hub and spoke route map is probably valuable for American as they attempt to maximize aircraft utilization but it is most definitely not valuable for the traveling public.

Another common example of ignoring the customer in the value proposition is automated phone answering. I am probably not the only customer who has hung up in anger when faced with an interminable list of push button options to get to speak to a "live" human being. I recall one example a few years ago that really got my attention. I was teaching a class at the Army's Command and General Staff College at Fort Leavenworth and needed to speak to someone in the Provost Marshal's office. I did not know the extension and was forced (by the automated phone answering system) to talk to personnel in five different offices. I eventually got to a "live" human being in the Provost Marshal's office but this took the better part of a half hour and all I could think of was, "I wonder what would have happened if I was calling in to report a terrorist threat!" The two preceding examples illustrate a very important issue. An organization must understand value as perceived by the customer. It is not unusual for a firm to understand what creates value from its perspective but to miss important value attributes of goods and

services from a customer perspective. It must be remembered that successful Focus Differentiation (the generic strategy we recommend for SMEs) mandates that we really understand what the customer's need, wants and desires are and, most importantly, what they will pay for.

It is common for many SMEs to have an implicit set of ideas about what their customers value. Unfortunately, this is not always accurate and comprehensive. I recommend that SMEs perform a customer survey at least annually among existing and potential customers. The technique is well-described in Warren Miller's new book - Value Maps (Miller, 2010)

The Value Stream

The Value Stream is a process map of all the steps (and delays) in designing, producing and distributing products and services to customers. The purpose of the value stream is to eliminate all possible delays and those steps in the process that do not add value - what the Japanese call muda. The value stream mapping process underlies what Hammer and Champy called Business Process Reengineering (Hammer & Champy, 2005) and Peter Drucker described this as "A new and systematic approach to structuring and managing work." I have used value stream mapping very successfully with clients like the Army Ammunition Plant (Parsons, Kansas) and Masonite Corporation (Pittsburg, Kansas). In every case we were able to eliminate significant process delays and non-value adding activities. The "bottom line" was that we were able to enhance efficiency and overall profitability. Value stream mapping can also be used effectively to enhance repetitive administrative functions in service organizations. Although there are many software products available to draw value stream maps, I recommend the low cost and common sense approach described by Jay Arthur in Six Sigma Simplified. The only tools required are a pen and a pad of Post It Notes (Arthur, 2004).

Flow

Once the Value Steam has been drawn, you will have a graphical representation of each step in the value stream and all of the intermediate delays and distances between steps. The idea then is to optimize the value chain by eliminating those steps that do not add value and minimizing the distance and time between steps. It is useful to think of this as eliminating "bottlenecks" (Goldratt, 1990). The net result of this activity is to move from vertical thinking where our focus has historically been optimizing individual functions to horizontal thinking where our focus is on optimizing cross functional activities.

Admittedly, refining the value chain can be challenging. People will not always agree, initially, on what all the activities are or on what the sequence of activities is. One way to illustrate that point is to ask two or three friends to draw the value stream for the activities involved in going to work in the morning. Presumably there would be great similarity in the steps in the value chain and roughly the same amount of time. Reality is there are substantial differences. Those of us who did some of our early growing up at places like Parris Island can roll out of bed when the alarm goes off and be in the car headed to work in as little as ten or fifteen minutes. That is not characteristic of all people. It is not unusual to find many folks who need a half an hour to an hour to get going in the morning. One very useful website which provides many tools for enhancing the value chain is Quarterman Lee's strategosinc.com.

Pull

Pull refers to an inventory management philosophy invented by Toyota and commonly called "Just in Time. (JIT)" As opposed to traditional in process inventory management, JIT requires downstream activities to "pull" products from upstream activities only as needed. The net results of implementing a pull philosophy are smaller batches (less inventory), significant reductions in floor space and better quality.

Reductions in floor space are achievable because of smaller in process batches and better quality results because the system cannot tolerate in process defects.

Perfection

Perfection is the fifth principal of a Lean Philosophy. It essentially means optimizing every element in the value chain by applying Six Sigma methods. Six Sigma was created by Bill Smith - an engineer at Motorola - in 1985. Six Sigma "migrated" to Allied Signal and then to General Electric (GE). Jack Welch (former Chairman of GE) reported in the 1999 Annual Report that Six Sigma added an incremental $2 Billion in profits to GE's bottom line (Box, 2005). Not surprisingly, the applications of Six Sigma proliferated widely during the 90s.

Getting started with Six Sigma can be an expensive proposition. Innumerable classes are offered that can cost as much as $25,000 per student. A better approach, I believe, is to purchase Jay Arthur's Q1 Macros. At $139 this Excel-based software provides all of the Six Sigma tools that you would ever need. Anyone familiar with Excel can use the software and many tutorials and examples are provided.

The focus with Six Sigma is to specifically identify a product, an operation or a process which exhibits an unacceptable level of defects and then to dramatically reduce the level of defects by employing a four-step process - Focus, Improve, Sustain and Honor (Arthur, 2003). This approach is attractive because it requires a small number of techniques as opposed to Total Quality Management or traditional approaches to Six Sigma.

Although originally developed to improve quality in manufactured products, Six Sigma has been recently employed in the healthcare field. It can also be used in repetitive administrative task so it's quite useable for most service industry firms.

CONCLUSION

There is little doubt that the US is in a recession. Unemployment is at a twenty seven year high. Home foreclosures are at record highs as are personal bankruptcies. The Dow Jones Industrial Average is approximately 30% below where it was in December, 2007. SMEs have suffered the economic downturn for nearly three years now and unfortunately some are predicting a "double dip" recession. Clearly these are turbulent times. What is needed for many firms is new strategy and supportive tactics. The following are recommended:

Step One: become a Focused Differentiator. This means identifying a market niche and discovering what differentiating features and options for goods or service are particularly appealing to customers.

Step Two: Adopt Hersey's Situational Leadership® Model. Adapt your leadership style to the readiness of your followers. This means moving from a command and control style to a participative style as followers develop over time.

Step Three: Adopt a Lean Philosophy. Understand your customer's value propositions and then optimize your value chain.

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THE RELATIONSHIP BETWEEN ORGANIZATIONAL PERFORMANCE AND PERFORMANCE RATINGS OF IN-ROLE AND EXTRA-ROLE BEHAVIORS

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ABSTRACT

An experiment was conducted investigating the effects of low versus high organizational performance on ratings of overall, in-role and extra-role behaviors. Based on the Werner's (1994) design this study provides useful insights into the main and interaction effects of performance on the ratings of employees. The theoretical rationale for the study is provided by Meyer and Zucker's (1989) theory of failing organizations in which they explain "how low performance can trigger forces favoring maintenance of organizations (1989: 11). Meyer and Zucker's (1989) theory contradicts conventional wisdom that poor performing organizations either improve or cease to exist. Results are discussed in terms of both prospect and attribution theories, and Meyer and Zucker's theory of failing organizations.

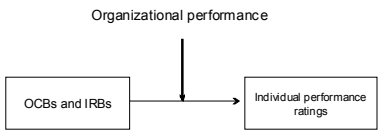
INTRODUCTION

Interest in organizational citizenship behaviors (OCBs) or extra-role behaviors has escalated since the publication of Organ and Bateman's (1983) seminal article. Subsequently, considerable research has examined antecedents of OCBs (George & Bettenhausen, 1990; Moorman, 1991; Munene, 1995; Organ & Konovsky, 1989; Podsakoff, Niehoff, MacKenzie & Williams, 1993; Smith, Organ & Near, 1983; Williams & Anderson, 1991; Podsakoff, MacKenzie, Paine & Bachrach, 2000; Shaw, Dinnen, Fang, & Vellella, 2009). While most of the research has addressed antecedents and consequences some researchers have attempted to link OCBs to performance under the assumption that OCBs are functional rather than dysfunctional. Some empirical evidence (Podsakoff, MacKenzie, Moorman & Fetter 1990; MacKenzie, Podsakoff, & Fetter, 1991; Sun, Aryee, & Law, 2007; Farh, Zhong & Organ, 2004) indicates that OCBs are related positively to performance. However, previous research has not examined the effect of organizational performance on performance ratings of in-role and citizenship behaviors. For example, how might the overall performance level of an organization affect how raters judge in-role and extra-role behaviors? If two employees have similar in-role and extra-role behaviors, will the organization's performance affect supervisor's ratings of the employees? Will organizational performance increase or decrease the effect of OCB's on performance ratings? These are the questions the present paper is trying to answer: that is to say, the aim of the paper is to examine the in-role and extra-role behaviors through the lens of organizational performance.

THEORETICAL BACKGROUND AND DEVELOPMENT OF HYPOTHESES

There is evidence that OCBs play a crucial role in promoting the effective functioning of the organization (Smith et al, 1983; Brief & Motowidlo, 1986; George & Bettenhausen 1990, Schnake, 1991, and Borman & Motowidlo 1993). OCBs are "behavior(s) of discretionary nature that are not part of the employee's formal role requirements, but nevertheless promote the effective functioning of the organization" (Organ, 1988: p.4). Five specific categories of these discretionary behaviors (some scholars prefer to call these extra-role behaviors) are: Altruism, Conscientiousness, Sportsmanship, Courtesy, and Civic Virtue. Based on this initial categorization scheme, researchers have sub-divided these OCBs into two categories viz., OCBOs (Organizational citizenship behaviors benefiting the organization) and OCBIs (citizenship behaviors benefiting specific individuals) (Williams & Anderson, 1991). Williams and Anderson (1991) demonstrated that raters distinguish between two types of OCBs as well as in-role behaviors (IRB). The present study focuses on IRBs and OCBs in performance ratings of employees. A simplified model is presented in the Figure 1.

Figure 1. Organizational performance moderating the relationship Between in-role and extra-role behaviors and individual performance ratings



Existing literature reveals that in addition to objective performance (i.e. in-role productivity) managers take extra-role contributions into account in their ratings of their employees (Avila, 1988; MacKenzie et al, 1991; Orr, Sackett, & Mercer, 1989; Werner, 1994). Since managers define performance more broadly than 'in-role' behavior, OCBs (both OCBOs and OCBIs) are expected to have an impact on performance ratings. Managers take into account extra-role behavior because they believe these behaviors promote organizational effectiveness by contributing to resource transformation, innovativeness, and adaptability (Organ, 1988).

H1a: Overall performance ratings will be significantly related to both in-role behaviors and citizenship behaviors.

Following Werner (1994), and Williams and Anderson (1991), this study separates organizational citizenship behaviors that benefit the organization in general (OCBO's) from those behaviors benefiting specific individuals (OCBI's). Williams and Anderson's (1991) factor analysis showed that raters can

distinguish OCBO's, OCBI's, and IRB's from one another. It is likely that supervisors would pay more attention to OCBI's than OCBO's since the former have greater hedonic relevance (Jones & Davis, 1965) for them. Jones and Davis (1965) argue that when an outcome has a greater personal consequence for a person, their evaluations will be more strongly affected than for outcomes with less personal relevance. Thus, OCBI's should affect performance ratings to a greater extent than OCBO's.

H1b: Overall performance ratings will be more highly associated with citizenship behaviors benefiting individuals than to citizenship behaviors benefiting the organization.

How might performance of the organization affect performance ratings supervisors and managers give their employees? While there is no direct empirical research that suggests an answer, prospect theory (Kahneman & Tversky, 1979), attribution theory (Heider, 1958; Jones & Davis, 1965; Kelley, 1967), Meyer and Zucker's (1989) theory of declining organizations, and empirical findings from the appraisal literature provide some guidance. First, we contend that performance of the organization will affect a rater's frame of reference. Evidence from the decision-making literature suggests that decision-makers are affected by whether they are in a gain or loss situation (Huber, Neale & Northcraft, 1987; Kahneman & Tversky, 1979; Marshall, Mowen & Stone, 1995). If a manager's organization's performance is problematic, they may perceive and interpret information very differently than when organization performance is strong and positive. Indeed, in high performing organizations, managers have less need to seek and examine negative information and will tend to focus on positive behaviors. However, when the organization needs extra-role behaviors from its members, workers who fail to demonstrate suck behaviors are apt to be judged more harshly than those exhibiting such behaviors. Attribution research (Jones & de Charms, 1957; Lanzetta & Hannah, 1969) suggests that if causes of behavior are attributing to lack of effort rather than ability, raters tend to punish more harshly. We argue that OCB's can be a more visible and isomorphic indicator of worker motivation and effort than IRB's. Therefore, managers in poorly performing organizations are likely to give greater weight to OCB's than managers in high performing organizations.

Meyer and Zucker (1989) contend that employees in low-versus high performing organizations will be more motivated to maintain the organization. Their argument is based upon the contrast of interests and motives of owners or other "residual claimants" versus employees under conditions of high versus low organizational performance. In high performing organizations, both owners and employees are motivated to maintain the organization. However, when performance declines, owners seek to cut their losses and shut down, while employees want the organization to continue since they are dependent on it. Poor organization performance will increase the hedonic relevance of subordinate performance for supervisors thus increasing the weight they may place on OCBI-type behaviors. Therefore, supervisors in low-performing organizations will place more emphasis on teamwork, cooperation and other OCBI-type behavior than in higher performing organizations.

Werner (1994), and Kiker and Motowidlo (1999) show that workers must have some minimum level of effective performance of IRB's before OCB's will have a positive effect on overall ratings or rewards. Thus, ratings will differ between employees demonstrating average versus high OCB'S only when IRB's are average or high. These arguments suggest the following their hypotheses:

H2: Overall performance ratings will be lower in low than high performing organizations.

H3: There will be a significant interaction between organization performance and OCB's.

H4: There will be a significant interaction between in-role behaviors and citizenship behaviors.

METHOD

Subjects

Subjects were 130 fourth-year students enrolled in business administration courses at a large university. Of 130 students, fifty-eight were females (45%) and seventy-two students were male (55%). The median age of Subjects was 22 years (SD = 5.44); average work experience was 5.8 years (SD = 5.62). Half the Subjects had supervisory experience and the average number of subordinates supervised was 4.6 (SD = 10.74).

Procedure

The experimental procedure utilized a scenario design in which Subjects role-played managers who job it was to evaluate the performance of staff working in the school of business at a university. Half the Subjects read a scenario describing a poor performing business school that was experience declining funding and enrollment, accreditation problems, and other difficulties while the other half read about a college that was performing very well. All Subjects were asked to rate six hypothetical employees based on six dimensions of IRB and OCB and overall performance. Order of presentation of employees was randomized to prevent order effects. Three levels of IRB were manipulated to portray high, average and low performance. Two levels of OCBI were manipulated portraying average and high levels of citizenship toward specific individuals (Puffer, 1987; Williams & Anderson, 1991). Following Werner (1994), OCBO was tied toward to level of IRB and only OCBI was manipulated. The resulting design is a 2 between and 2 X 3 within Subjects. Stimulus materials and measures are drawn from an earlier study by Jon Werner (1994). Stimulus materials included empirically derived critical incidence for each performance dimension.

Variables and Measures

Overall Performance ratings, Subjects provided overall ratings for each of six hypothetical employees (arbitrarily named Chris, Jody, Kim, Lynn, Pat and Terry) on a seven-point scale. A rating of seven was labeled exceptional and consistently exceeds expected levels; four was labeled as competent, meets all the job requirements; and a rating of one was labeled unsatisfactory representing below acceptable levels.

In-role Behavior (IRB) and Citizenship Behavior Ratings. Subjects rated two dimensions of IRB (productivity and job knowledge, and accuracy), two dimensions of general organization citizenship behavior (OCBO) (attendance and following policies), and two dimensions of citizenship benefiting

individuals (OCBI) (cooperation and teamwork and extra effort and initiative). The scales were the same as used to rate the overall performance.

Independent variables

The independent variables were the level of IRB (high, average, or low) and the level of OCBs (high or average). The independent variables were manipulated using a 3x2 within subjects' design in which each rate repeated one possible pairing of IRB and OCB. Performance dimensions and corresponding categories are:

Dimension 1. Job knowledge and accuracy of work: possessing the necessary knowledge and skills to perform the job and accuracy and thoroughness of work (IRB).
Dimension 2. Productivity: the amount of work completed and ability to efficiently organize work (IRB).
Dimension 3. Dependability and attendance: infrequent tardiness, unscheduled absences, and others (OCBO).
Dimension 4. Following policies and procedures: following all necessary rules, regulations, policies and procedures (OCBO).
Dimension 5. Cooperation and teamwork providing assistance and support to others and coordinating with others (OCBI)
Dimension 6. Extra effort and initiative: takes on extra tasks when needed and goes the extra mile.

These performance dimensions and corresponding categories were used in prior studies (Williams & Anderson, 1991; Werner, 1994).

Data Analysis

We used one between and two within-subjects experimental design in our study. An advantage of the within-subjects portion of this design is its greater statistical power, compared to between subjects designs, to detect significant effects (Kirk, 1996).

Hypotheses H1a and H1b were tested using correlations and Hypotheses H2 through H4 were tested using repeated measures multivariate analysis of variance (MANOVA). The SPSS Statistical Package provides partial eta-squared values with which effect size may be estimated. Though these partial eta squared values are not equivalent to the squared semi-partial coefficients in regression analysis, they do provide a general sense of the relative magnitude of the hypothesized effects (Cohen, 1977).

RESULTS

Manipulation checks for the between subjects variable, organizational performance, was examined via a single five-point scale item asking the subjects to rate the performance of the business school in the scenario from poor to excellent. The mean for the poor performing condition was 3.29 (SD

= .73) versus 3.67(SD = .56) (t = -3.319, p < .001). In addition to the statistical manipulation check, written responses from subjects suggest they understood the task, took the task of employee performance appraisal seriously, and viewed it as realistic. Finally, means for overall performance ratings of the six hypothetical employees were in the same rank order but were slightly more lenient than ratings provided by 15 subject matter experts in Werner's 1994 study (Werner, 2000).

Hypothesis 1a stating that overall performance ratings will be significantly correlated with both OCBO's and OCBI's is supported by the data shown in Table 1. Table1, showing means, standard deviations, and correlations for overall performance, IRB's, OCB's, OCBO's and OCBI's shows that ratings of overall performance are significantly related (p<.01) to all other performance ratings. Hypothesis 1b, which states that overall performance, will be more highly correlated with OCBI's than OCBO's also receives only directional support from the data shown in Table 1.

Table 1. Descriptive statistics and zero-order correlations between the variables

	Mean	SD	IRB	OCB	OCBO	OCBI
IRB	3.97	.58				
OCB	4.59	.57	.80**			
OCBO	4.18	.56	.85**	.76**		
OCBI	5.11	.65	.67**	.95**	.76**	
OVERALL	4.45	.55	.78**	.91**	.85**	.87**

** p < .01 (2-tailed)

The difference between the correlations, .87 for OCBI and overall performance versus .085 for OCBO is small. Interestingly, IRB has the smallest correlation (.78) with overall performance and OCB's correlate the highest at .91.

Hypothesis 2 argues that overall performance ratings will be lower in the low versus high performing organization. Results of MANOVA, seen in Table 2, show a significant main effect for performance (F = 2.29, p < .05, partial eta square =. 037). Mean overall performance ratings for the low performing organization is 4.02 versus 4.21 for the high performing organization.

Hypothesis 3 states that organization performance will interact with OCB's. Table 2 shows that the interaction between performance and OCB's is not significant thus failing to support Hypothesis 3. Results also indicate no interaction between IRB's and organizational performance. However, IRB's OCB's and the IRBxOCB interaction are all significant (p < .001) and have large effect sizes. Specifically, effect sizes for IRB's are .882, for OCB's, .475 and for the interaction of IRB and OCB's .187. The absence of a three-way interaction suggested pair-wise comparisons and examination of pairs for significant differences. Results of Multivariate Analysis of Variance are presented in Table 3.

Table 2. The Multivariate Analysis of Variance for In-role Behaviors (IRBs), Organizational Citizenship Behaviors (OCBs), and Interaction effects with performance

	Wilks Lambda	F	Significance of F	Effect Size
Performance	.899	2.296	p < .05	.037
OCB	.525	57.424	p < .000	.475
IRB	.118	474.57	p < .000	.882
Performance x IRB	.972	1.774	.p > .100	.027
Performance x OCB	.997	.335	p > .100	.003
OCB x IRB	.812	14.62	p < .000	.187
Performance x OCB x IRB	.982	1.124	p > .100	.017

Table 3. The Multivariate Analysis of Variance for In-role Behaviors (IRBs), Organizational Citizenship Behaviors benefiting individuals (OCBIs), and Citizenship Behaviors benefiting organization (OCBO) and interaction effects.

	Wilks Lambda	F	Significance of F	Effect Size
OCBO	.957	5.688	p < .05	.043
OCBI	.441	162.524	p < .001	.559
IRB	.118	474.571	p < .001	.882
IRB x OCBO	.899	7.161	p < .001	.101
IRB x OCBI	.721	24.595	p < .001	.279

Table 4. Pair-wise comparisons and multivariate tests for the effects of IRB and OCB

	I	J	I-J	Wilks Lambda	F Value	Eta square
IRB	1	2	.562*	.954	1258.470*	.954
	1	3	2.127*			
	2	1	-.562*			
	2	3	1.565*			
	3	1	-2.127*			
OCB	1	2	.351*	.253	324.501*	.727
	2	1	-.351*			

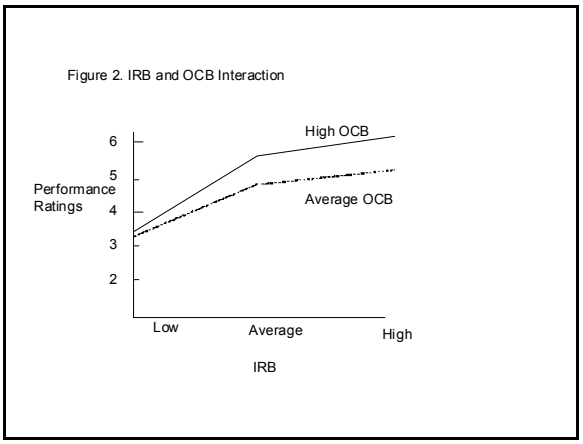
* p < .001

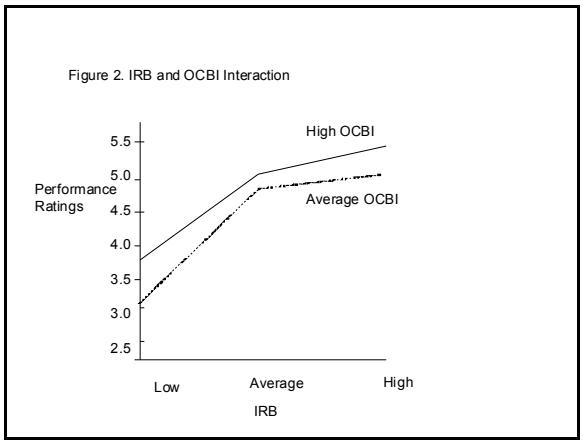
The pair-wise comparisons shown in Table 4 revealed that the differences between three levels of IRB and two levels of OCB are significant. These findings further corroborated the strength of the design.

These tests are based on the linearly independent pair-wise comparisons among the estimated marginal means.

The results of multivariate tests for the effects of IRB and OCB, based on linearly independent pair-wise comparisons among the estimated marginal means also revealed interesting results. The partial eta squares are as high as 0.954 for IRB and 0.727 for OCBs.

Hypothesis 4 contends there will be an interaction between IRB's and OCB's. Support for this hypothesis is seen in Table 2 ($F = 14.63$, $p < .001$), partial eta square = .187). As hypothesized, the difference between means of overall ratings is not-significant for low IRB's (3.09 versus 3.22) but significant at both average (4.51 versus 4.93) and high (5.03 versus 5.53) IRB's (See Figures 2 and 3).





DISCUSSION

Overall, the results for H2 and H3 of this study suggest that organization performance can affect performance ratings, but the effect is the main or level effect rather than the hypothesized interaction. Logically, no organization performance effect should have emerged since subjects were rating exactly the same workers. This suggests that the decision-making frame of raters may have a small but significant biasing effect. Specifically, it appears that Meyer and Zucker's failing organization effect can influence the perception of raters such that behaviors that would help a failing organization are emphasized in subordinate ratings. Additionally, this is consistent with attribution theory research since the declining organization makes subordinate performance more hedonically relevant to supervisors (Jones & Davis, 1965). Also research by Jones and de Charms (1957) and Lanzetta and Hannah (1969) suggest workers demonstrating OCBI-type behaviors would be rewarded more than other behaviors. Results of Hypothesis 1a and 1b indicate strong positive relationships among all performance ratings with ratings of overall performance. While this finding is consistent with Werner (1994), the relationships are stronger than in some research (MacKenzie et al, 1991; Williams & Anderson, 1991).

Hypothesis 4 found an interaction between IRB's and OCB's as hypothesized based upon work by Werner (1994) and Kiker and Motowidlo (1999). Since Werner and others have argued that OCBI's have a greater influence on ratings than OCBO's we also examined them separately. Comparison of Figure 2 with 3 shows that OCBI's not, OCBO's account for the bulk of the IRBxOCB interaction. This finding further supports arguments of Williams and others that cooperation and teamwork, extra effort and initiative are the true essence of OCB's. Additionally, the fact that performance ratings are not affected by OCBs' particularly OCBI's until the level of IRB is at least average or high is consistent with Werner(1994) and Kiker and Motowidlo's (1999) findings. Thus, as seen in Figure 3, from an attribution perspective, supervisors reward high level of OCBI more than average OCBI, especially when IRB's are high. Finally, it is likely that, regardless of organization performance level, OCBI's are perceived as more valuable or hedonically relevant for supervisor than OCBO's (see Figures 2 and 3). Indeed, the correlations between IRB and OCBI (.67) versus IRB and OCBO (.85) suggest that supervisor difference OCBI's from IRB's is to greater extent than OCBO's. This suggests future appraisal research should consider more closely examining OCBI-type behaviors.

Implications for practice

Present research demonstrated that organizational success depends on both task behaviors and citizenship behaviors of employees. While task performance is directly related to the technical core, the citizenship behaviors beyond the defined roles go a long way in enhancing organizational effectiveness. The present research focuses on the relationship between citizenship behavior and organizational performance, especially in the context of low-performing organizations. When performance of organizations is falling, the managers need to focus on employees' extra-role behaviors that promote to the benefit of organization (Shaw, Dinnen, Fang, & Vellella, 2009). Some of the latest human resource practices focus on the employees' extra-role behavior (both OCBO and OCBI) and following the prospect theory, such focus would enhance both employee productivity and organizational performance (Lepak & Shaw, 2008). Absence of rewarding the employees who contribute to the organization may often results in counterproductive behavior (Dalal et al, 2009). Managers also need to focus on individual personality traits and their effects on the patterns of citizenship behavior (Ilies, Scott, & Judge, 2006). The results from the present research indicate that job performance function not only of task performance but of contextual behavior, such as organizational citizenship behavior, of employees at job.

Limitations of the study

Some may argue this laboratory study is 'artificial' and lacks external validity. Responses to such arguments have been provided by Berkowitz and Donnerstein (1982) who contend "….to the extent that this artificiality stems from control over irrelevant variables, the artificiality is a strength and not be a weakness of experiments" (1982:256). To corroborate further, Dipboye and Flangan (1979) argue that "contrary to the common belief that field settings provide for more generalization of research findings than laboratory settings do, field research appears as narrow as laboratory research in the actors, setting and behaviors sampled" (1979:141). Ilgen (1986) laid the conditions for which laboratory studies are appropriate and maintained that "laboratory conditions can be constructed that establish performance

conditions against which ratings can be compared and accuracy can be assessed" (1986:263). The data of this study closely match those of Werner (1994) study in which supervisors and managers responded to identical stimuli presented via computer program. Finally, it is important to remember that the concept of OCB had its birth in the laboratory. Earlier research by Williams and Anderson (1991) and Werner (1994) continued this tradition analyzing the effect of in-role and extra-role behaviors in carefully manipulated experimental settings.

This study examined the effects of a 'declining organization' (Meyer & Zucker, 1989) on performance ratings while replicating the Werner (1994) study. Future research should attempt to verify our findings of greater emphasis on OCBI's in actual declining organizations. Ideally, longitudinal research should examine shifts in the weight given to OCBI-type behaviors from times of organization success to those of failure or decline. Finally, if participants in troubled organizations demonstrate more of the cooperation and teamwork of OCBI's, it is an empirical question if these behaviors lead to better organization performance.

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