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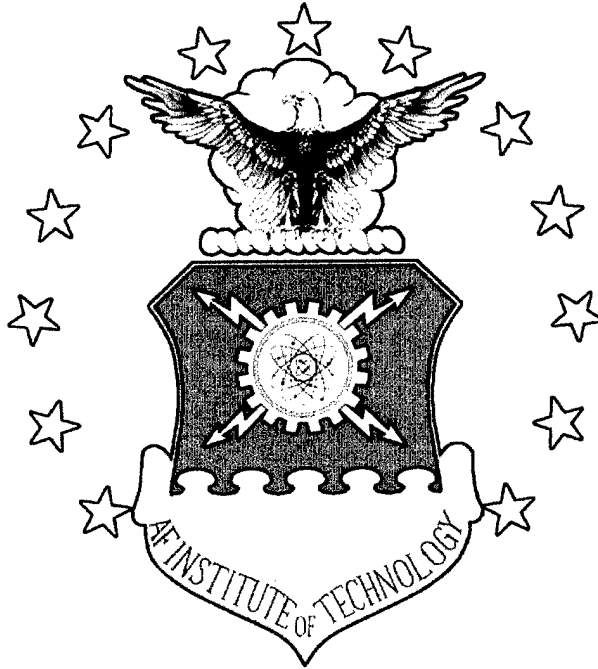
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**CHANGING ORGANIZATIONS: A META-ANALYSIS OF CHANGE
IMPLEMENTATION STRATEGIES' EFFECTS ON ORGANIZATIONAL
OUTCOMES**

THESIS

Jay A. Welborn, Captain, USAF

AFIT/GEE/ENV/01M-24

**DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY**

AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

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AFIT/GEE/ENV/01M-24

CHANGING ORGANIZATIONS: A META-ANALYSIS OF CHANGE IMPLEMENTATION
STRATEGIES' EFFECTS ON ORGANIZATIONAL OUTCOMES

THESIS

Presented to the Faculty

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In Partial Fulfillment of the Requirements for the
Degree of Master of Science in Engineering and Environmental Management

Jay A. Welborn, B.S.

Captain, USAF

March 2001

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED

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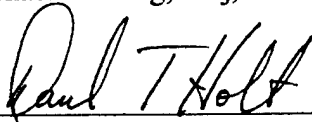
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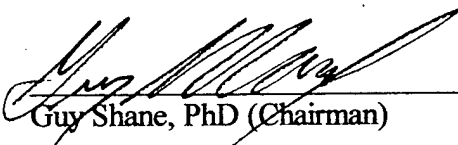
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Abstract

This research represents a meta-analysis of 24 empirical studies that explored and identified which organizational factors moderated the relationships between facilitation strategies and change adoption. The results indicate two key facilitation strategies, participation and communication, that produced significant results. Participation resulted in a positive impact on job satisfaction, organizational commitment, performance, and turnover rates, while communication resulted in a positive impact on job satisfaction, organizational commitment, change adoption, and intent to remain. Contrary to many research studies, participation strategy was a non-significant moderator for change adoption. The identified strategies and outcomes were then analyzed for potential moderators. Due to the lack of correlation data, only 10 of 40 potential moderators were analyzed. Four of the 10 moderators only had two correlations, which was the minimum number required for analysis. As a result, all 10 moderators analyzed resulted in a non-significant impact on the outcomes, making the moderator analysis questionable.

CHANGING ORGANIZATIONS: A META-ANALYSIS OF CHANGE IMPLEMENTATION STRATEGIES' EFFECTS ON ORGANIZATIONAL OUTCOMES

I. Introduction

If you were to speak with business leaders, they might tell you “the only thing constant in business today is change.” External constraints, internal constraints, dwindling resources, and competitive markets have forced many organizations to examine their methods of producing goods and services in order to maximize economic returns. As a result, American business organizations in recent years have been constantly undergoing some type of change ranging from what might be considered small policy changes, to rather significant reorganization or reengineering of an entire organization, to completely outsourcing entire work functions. Indeed, the practitioner literature is filled with examples of such changes. For instance, on the most basic end of the change spectrum, the famous diamond retailer DeBeer’s is changing the way its dealers refer to and package their products in hopes of boosting market share (Stein, 2001). On a more complex end of the change spectrum, Allen and Chandrashekar (2000) stated that many major corporations have outsourced some part of their service to include aircraft maintenance for airlines, concierge services for hotels, and mailrooms for banks to training, logistics, and purchasing for other companies.

Although organizational changes are initiated in response to these challenges, leaders should expect to encounter problems. For example, the change to outsourcing a work function, short of business closure, may be one of the most complex organizational changes being implemented today. In outsourcing, entire work functions are no longer performed by the

company, but are contracted out to other business organizations to accomplish the work. By outsourcing, companies are hoping to gain efficiencies, cut costs, and concentrate on their core competencies (Lever, 1997). Some companies, like Nike, Inc., the largest supplier of athletic shoes, have capitalized on efficiencies and cut costs through outsourcing 100 percent of its shoe production (Quinn & Hilmer, 1994).

Still, problems both internal and external to the organization will most definitely arise. Internal problems, stemming mainly from the organizational culture, may include a drastic decline on the morale of the employees involved as they can ultimately lose their jobs if their services or area of expertise are no longer needed (Nelson, Cooper, & Jackson, 1993). Although they stand a good chance of getting a job with the company that took over the outsourced work, there are no guarantees and it may mean uprooting families and leaving friends. In specialized career fields, this may mean a long period of unemployment and a tedious search for a similar job in a related field. Another internal impact might be on the remaining employees in the organization who must deal with the loss of their coworkers, take up the slack of the outsourced employees who usually have job responsibilities beyond what is outsourced, and deal with a new contractor. The remaining employees may also feel guilty or experience survivor's syndrome for having withstood the downsizing initiatives. According to Noer (1993), survivor's syndrome is a result of breaking the basic binding trust between the organization and its employees. These adverse outcomes may offset any potential gains expected from the outsourcing initiatives.

Some external impacts of outsourcing to organizations are that managers now face risk in receiving work that lacks quality like failing to meet standards and in getting the quantities necessary through reduced control over the contractor. Because managers are bound by the work as defined in the contracts, a lack of flexibility may also exist over the new contractor. Any

changes to or missed requirements in the contract can mean costly revisions for the management (Allen & Chandrashekar, 2000).

Clearly, outsourcing is a major change; however, anticipating and identifying the internal and external challenges and their impacts early in the change process may be the key to dealing with the organization's biggest challenge during any change effort, implementation.

Implementation of any change, big or small, can ultimately determine the overall success of the change. While some companies appear to successfully implement changes in their organizations, others continue to struggle with the process (Nutt, 1986). Therefore, understanding the implementation process and the facilitation strategies that most often succeed would be extremely valuable to an organization. With the continual change the USAF is undergoing, perhaps knowledge of successful change facilitation strategies is in order.

Research over the past 60 years has suggested that organizations systematically progress through multi-phase processes as they attempt organizational change. Initial conceptualization of these phases were unfreezing, moving, and refreezing (Lewin, 1947). A later model suggested a five-phase process consisting of (a) analyzing and planning for the change; (b) communicating the change; (c) gaining acceptance of new behaviors; (d) changing from status quo to a desired state; and (e) consolidating and institutionalizing the new state (Judson, 1991). Then came an eight-phase model that built upon Judson's model but added (a) establishing a sense of urgency by relating external realities and potential crises and opportunities facing an organization; (b) creating a vision of the desired end-result and empowering others to act on the vision by changing policies, structure, and procedures in ways that will facilitate implementation; and (c) planning for and creating short-term wins by publicizing success and building momentum for continued change (Kotter, 1995). Another nine-phase model made up of wedges that formed a

wheel that was similar to Kotter's model except that it added "pilot testing" the planned change prior to implementation (Galpin, 1996).

Regardless of the specific phases of the change process, organizations choose to embark on the change journey to positively strengthen organizational performance and effectiveness. The prosperity reaped and the speed of acceptance and implementation at the end of the process is achieved in part by the influence strategies used by organizational leaders. These influence strategies encourage affected employees to adopt the appropriate behaviors that translate into organizational gains. If the best influence strategy is identified and used to send messages about the change, the organization should move successfully through the change process and reap the desired benefits.

On this basis, many researchers have offered managers guides that suggest implementation strategies that can be used when trying to facilitate organizational change. For example Caruth, Middlebrook, and Rachel (1995) say in order to overcome resistance to change you must first (a) create the proper attitude and (b) communicate, communicate, communicate. Then, leaders must set a good example, solicit opinions from employees, and lastly reward acceptance. Another guide, offered by Henry (1997), suggests that leaders unite in their commitment and ensure all leaders personally agree. Henry goes on to prescribe that leaders must be able to articulate the rationale for their strategy of change and be prepared for anticipated normal resistance.

While these recommendations are good for leaders, Armenakis, Harris, and Field (1999) suggested seven very specific influence strategies that could be used by leaders to implement change. These include persuasive communication, participation by those affected, alignment of human resource management practices, symbolic actions, diffusion programs, management of

internal and external communications, and formalization practices. For example, in the struggle to gain dominance in the appliance industry, two Whirlpool CEO's, Jack Sparks in 1983 and David Whitman in 1987 aggressively communicated and built a readiness for change. Sparks instituted a formalized strategic planning process that included both active participation and managing internal and external communications. The use of these implementation strategies has positioned Whirlpool to aggressively meet the challenges of a world economy (Armenakis, Harris, & Mossholder, 1993).

While all of these recommendations and examples seem to indicate that the influence strategies facilitate the adoption of change, much of what researchers know about influence strategies are based upon anecdotal case studies, experiments, and observations. Indeed, this sentiment was echoed in a recent review of organizational change literature that argued many of the recommendations given by researchers are viewed with reverence and quotations "reiterated without any proof or disproof (Weick & Quinn, 1999, p. 363)." This suggests that researchers have the responsibility of determining which influence strategies are the most beneficial or could produce the most harm given a specific organizational change context. "The ability to identify general principles is important because it marks where we stand as a science and, hopefully, it encourages the making of policy decisions - at both an organizational and societal level - that are consistent with accepted facts (Guzzo, Jackson, & Katzell, 1987, p. 412)." This bottom line was further emphasized recently when Farias and Johnson (2000) stated: "the discipline needs a better understanding of the factors leading to successful change."

Air Force Situation

The United States Armed Forces have used facilitation strategies like communication, and participation to implement mission objectives throughout history. Whenever new conflicts arise or new policies are being introduced, the changes necessary to make Air Force missions a success are implemented using many of the strategies already mentioned. In fact the word strategy, or to strategize, has its origin in military history. The Greeks first used the term “strategos” to refer to a general in command of an army. Later strategy came to be “referred to the skill of employing forces to overcome opposition (Mintzberg and Quinn, 1996, p. 1).” It is only in the past century that “strategy” has trickled over into the business world. (Mintzberg et al., 1996). It would appear on the surface that the military would be the forerunner in understanding and implementing strategy as it applies to changes in the military’s workplace, but making the transition from implementing wartime tactics to implementing business strategy decisions is a continuous struggle for today’s modern military. The battleground looks quite different from a business perspective. In the past, budgets appeared limitless, necessary workforces were readily available, and doing more with less was not a concern. Now, instead of facing a hostile enemy of a foreign nature, military leaders find themselves face to face in battles over funding, resource efficiency, and a refocus to their core competencies, which is to train and ready its members for the next national threat. It is now in the 21st century that the business world as a whole, motivated by profit and competition, has far surpassed the military through the use of influence strategies in change implementation. And it is now that the military has a continually growing need to not only understand, but also to successfully implement change strategies in order to achieve the desired outcomes necessary to maintain its status as the world’s most effective military organization. By taking advantage of the business world’s experiences,

successes, and failures, the military leaders, and more specifically the Air Force leaders, may be able to better implement their own solutions for policies set forth by Congress.

The United States Air Force has a pressing need for solution-oriented implementation of organizational change as it has experienced a substantial increase in the number of downsizing initiatives over the past few years. These initiatives may include reengineering squadrons and groups, outsourcing, privatization of housing and utilities, and complete Base Realignment and Closure. These change initiatives will continue to grow over the next few years, as the current Air Force philosophy is to outsource all work functions that can be accomplished by the private sector. Although outsourcing has been around since the early 1970's, the Government Accounting Office (GAO) has encouraged all Department of Defense agencies to outsource commercial activities whenever possible. According to the GAO, outsourcing is defined as, "Contracting out to the private sector to operate and/or maintain a commercial activity (GAO, 1997, p. 2)." In the case of outsourcing, the government still maintains ownership of the infrastructure, facilities, and equipment associated with the commercial activity. In order to distinguish the difference between a governmental function and a commercial activity, Air Force Pamphlet (AFP) 26-12 states,

A governmental function is one that is so intimately related to the public interest as to mandate performance by Department of Defense employees. These functions include those activities requiring either the exercise of discretion in applying governmental authority or the use of value judgment in making decisions for the government. [It defines a commercial activity as] an activity that provides a product or service obtainable from a commercial source. A commercial activity is not a governmental activity (p. 4).

By 1996, the Air Force estimated that it had "outsourced 64 percent of its workforce performing commercial activities." From 1996 to 2003, the Air Force plans on studying up to "60,000 additional positions for potential outsourcing (Romasz, 1999, p. 2)."

The U.S. military forces are subject to many of the same sources of change that private organizations must face. However, most military personnel, like their civilian counterparts, are only accustomed to dealing with minor changes. Air Force Manual 10-100 states, “The world is changing fast. New threats, new technologies, and new tools are changing the way we prepare for conflict (p. 6).” It is critical that military leaders prepare their personnel for the major organizational changes taking place, as the impacts on the personal lives of all the employees involved can be substantial and affect most if not all of the organization. In her article in the Winter 1998 issue of Airpower Journal, Lt Col Sandra J. Reinke states,

Change is frightening. In this age of downsizing, reorganization, movement of units, base closures, frequent deployments, outsourcing, and privatization, change is everywhere. Such major changes to the way we’ve always done business in the Air Force have left many people feeling disoriented and lost (p. 2).

These change impacts can adversely affect the employee’s willingness to cooperate and ready themselves for the change process and can become a major hindrance for the commanders and project leaders tasked to implement downsizing initiatives. As a result, further study is required to identify ways of helping commanders, managers, and employees deal with the influence and magnitude of these changes.

Research Questions

With the amount of Air Force downsizing and cost-saving initiatives in mind, one might ask: “Are there certain guidelines an organization should use to ensure a smooth transition during major organizational change efforts?” Along with this, another question to be answered is: “Are there trends of strategies used by businesses that successfully implemented organizational change, that can be applied to ease the impact felt on Air Force employees that are undergoing major change initiatives?”

Research Scope

Managers have the responsibility and choice to determine which facilitation strategies to employ to implement organizational changes. Figuring out which choice is best suitable for a given change situation was the driving factor for conducting a meta-analytic review of the empirical literature. The review tested the hypothesized relationships between influence strategies and change adoption, explored which organizational factors moderated the relationships between influence strategies and change adoption, and identified directions of future research that were aimed toward developing a contingency theory of organizational change.

Method

For this thesis, a meta-analytic review of past research studies is used as the primary tool for assessing industry trends in organizational changes. Meta-analysis is a statistical technique used to combine the results of several independent studies (Nicol & Penny, 1999). In this meta-analysis, studies that concentrated on the different facets of organizational change are recorded and analyzed. By using the meta-analysis, a true measure of the effect sizes across several means and correlations can be used to assess an overall acceptance or conclusion (Durlak, 1995).

The meta-analytic process is similar to other research processes with the exception of not actually conducting experiments, administering questionnaires, or recording new data as seen in most research studies. Instead, the meta-analysis uses individual studies in place of subjects and collects data already recorded from previous studies that are relevant to the research area. From the pooled data, statistical tests are applied and results are interpreted (Guzzo et al., 1987).

Overall, the meta-analysis can be broken down into five main parts. Part 1, Formulating the Research Question, introduces the question that is attempting to be explained by the meta-analysis. Part 2, Literature Search, explores the relevant studies and provides a nonbiased sample of past investigations. Nonbiased is the key in the validity of the meta-analysis. Part 3, Study Coding, develops a procedure to translate the collected and usually somewhat different features of each study into an organized and usable format for evaluation. Part 4, Statistical Analysis, generally applies the preferred, but not necessarily mandatory, index of Effect Size (ES) to transform the individual data from each study into a common metric. Part 5, Conclusions and Interpretations, provides a summary of findings specific to the literature being evaluated, limitations from the data collected, and identifies items to improve future research.

Thesis Organization

This thesis is organized into five chapters. Chapter I, Introduction, introduces the background theories central to the study, the purpose of this study, and the primary research focus. Chapter II, Literature Review, establishes a baseline for work that has been accomplished in similar areas. It explores in greater detail the development of the theories by researchers in the field, and develops the research hypotheses that will be used to answer the research question. Chapter III, Methodology, outlines the detailed steps of the meta-analysis process used to review the selected studies. Chapter IV, Analysis, conducts a statistical analysis across the effect size means of the selected studies. Chapter V, Conclusions, presents a summary of the research, the conclusions of this author, and recommendations for further research and application.

II. Literature Review

Researchers are continually searching for answers as to why things work or fail. The change process in the workplace, complex in nature, is no exception. Researchers find it hard to identify and say with authority that one particular implementation strategy working in one organization and situation will work across the board based on individual studies. Thus, a number of studies have been designed with each study bringing another piece of the puzzle to the overall change picture. Unfortunately, each individual piece studied, unique to one organization, may not necessarily apply to other organizations. Therefore, conclusions found in one study sometimes are contradicted by another research study. As a result, several researchers have opted for meta-analysis as an avenue or a way of finding more generalizable findings across many studies.

Previous Meta-Analysis Change Research

The contradictions common from one study to another may be a result of different study characteristics and change factors. In response to this problem, several researchers like Neuman, Edwards, and Raju (1989), Damanpour (1991), and Robertson, Roberts, and Porras (1993) have conducted meta-analytic reviews to identify more generalizable commonalities from the results of several studies. Each research study included in a meta-analysis can have many different impact factors, called moderators, which can affect the correlational outcomes. Some examples of moderators include the study sample type like managerial or non-managerial, change type like outsourcing or reorganization, organization type like public or private, organizational context

like service or manufacturing, and organization size like small, medium, or large. The focus and findings of these three meta-analyses are covered chronologically.

Starting with the earliest, a meta-analysis of 126 studies by Neuman, Edwards, & Raju (1989) looked at the effects of organizational development interventions and their effects on satisfaction and attitudes. Neuman, et al. (1989) used facilitation strategies like participation, goal setting, and team building. Their study also focused on job design and enrichment and identified moderators like organizational levels of the participants and methodological rigor that proved to be significant. Although Neuman et al.'s (1989) study is similar to this meta-analysis, it only partially covers facilitation strategies, moderators, and the two outcomes of satisfaction and attitudes. The study is also somewhat outdated as it only covers studies up to 1986. The results of this same study if conducted today, bearing in mind the excessive number of business downsizing efforts that have taken place from the late 1980's to the current downsizing efforts, may be significantly different. With this in mind, this meta-analysis provides an up-to-date look at change facilitation strategies, outcomes, and moderators.

Next, from 23 empirical studies, 21 articles, and 2 books, Damanpour (1991) studied the relationship between organizational innovation and 13 determinants. The determinants consisted of structural, process, resource, and cultural types of variables. The results of the study found significant associations with: Specialization, functional differentiation, professionalism, centralization, managerial attitude toward change, technical knowledge resources, administrative intensity, slack resources, and external and internal communication. Even though Damanpour's main focus was primarily centered on job structure and personal positions, he also found that the effects of determinants on organizational innovation are not necessarily unstable across different studies and he identified that most of the studies included in the meta-analysis were never

analyzed for the impact of the moderators on the outcomes. In fact the moderators were never even considered as having any impact at all. One downside to the study was that it did not address how the changes were implemented or what facilitation strategies were used during the change process.

The last meta-analysis example, consisting of 52 empirical studies conducted by Robertson, Roberts, and Porras (1993), was similar to Damanpour in that it looked at organizational and job structure as well. This study, however, went on to develop a theoretical model on the dynamics of planned organizational change that included components of change activity on four organizational work settings. They are (a) Organizing Arrangement, (b) Social Factors, (c), Technology, and (d) Physical Setting. These settings according to the analysis impacted individual behavior and thus affected organizational outcomes of performance and individual development. The results suggested that change agents should focus on systematic change in the work setting as the starting point in change efforts and on individual behavior change as a key mediator associated with organizational outcome. Another significant result was that negative behavior change did not necessarily lead to a negative organizational outcome. This meta-analysis also supported the conclusions of previous reviews (Guzzo, Jette, & Katzell, 1985; Neuman, Edwards & Raju 1989; Nicholas, 1982; Porras, 1979) that different types of interventions are not equally effective in generating change in different dependent variables. Overall as with Damanpour, no mention of how the changes were implemented or the facilitation strategies used is given.

For the three meta-analysis reviewed, the changes or strategies used differ in fundamental perspective on how this paper was viewed. The strategies in Neuman, et al., Damanpour, and Robertson, et al. were not designed to actually facilitate change, they were changes themselves

and the effectiveness of these strategies was evaluated. In other words, the change strategies were not used as a means of implementing larger organizational changes like outsourcing or policy changes. From a different perspective, this meta-analysis evaluates the strategies as they are integrated into the entire change process and as they are used to facilitate the adoption of larger changes.

Organizational Change Strategies, Outcomes, and Moderators

Similar to Neuman, et al., (1989) this meta-analysis provides a more current and vivid focus on the influence strategies used to facilitate organizational changes and their effect on the change outcomes. This analysis also examines the moderators that have a potential impact on the strategies used and the overall outcomes of the planned organizational change. Simple moderators like the type of organization, the size of the organization, and the type of change taking place could potentially impact the overall outcomes in a given context. A simple model adapted from Armenakis, et al., (1999) that looks at this facilitated change process is presented in Figure 1.0.

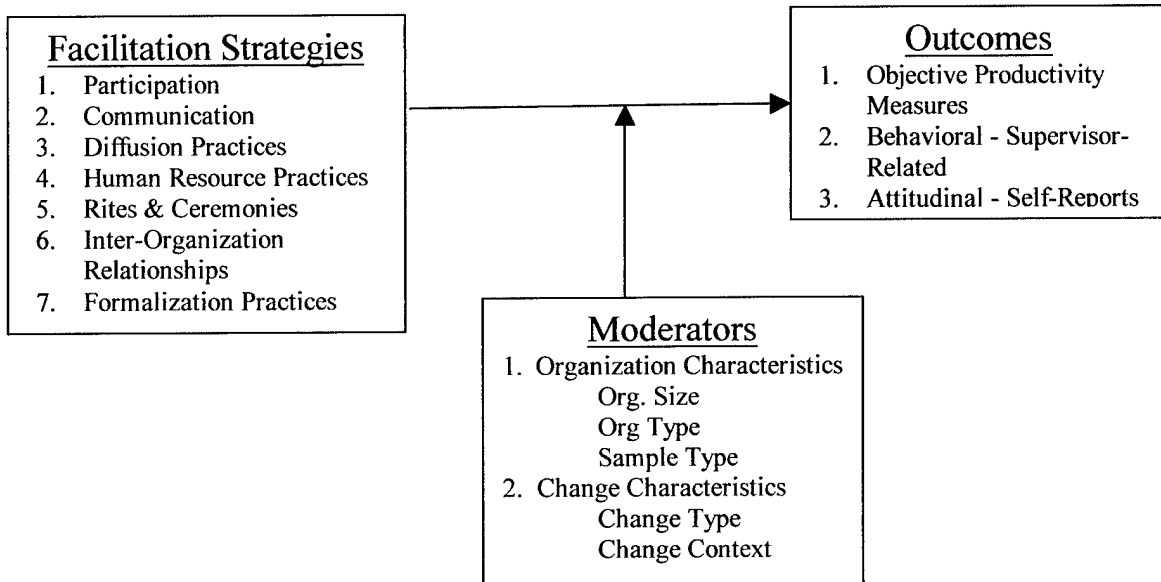


Figure 1.0 Simplified Model of the Process to Facilitate Organizational Change.

Facilitation Strategies

There are seven facilitation strategies that were used in the analysis; a study was assigned to one of these strategies depending upon the primary focus the organization used to facilitate the change process. The strategies are Participation, Communication that includes both internal and external management of information, Diffusion Practices, Human Resource Practices, Rites and Ceremonies, Inter-Organization Relationships, or Formalization Practices.

Participation

One of today’s most accepted strategies designed to help leaders facilitate and implement changes is the strategy of participation. Participation continues to be the focus of many research projects as many positive outcomes have been identified from its use to include favorable job

attitudes, improved health, and a better understanding of work tasks (Witt, 1992). According to Thibaut and Walker, (1975), participation can take on two forms, (a) choice and (b) voice. Witt (1992) suggests that both choice and voice reflect participation. To another degree, some researchers assert that participation is the primary means of empowering employees within an organization (e.g., Atchison, 1991; Powell, 1995) and make an assumption that the greater the level of participation, the more positive the outcomes.

When looking at the differences between choice and voice, choice is defined as the participant having some actual control or authority over the outcome of the decision being made. Whereas, voice is where the participants articulate their interests to the decision-maker (Witt, 1992). Witt goes on to say that voice can include influence in all aspects of a decision problem such as defining the problem, gathering information, and coming up with alternatives, however, it does not include the actual decision-making. Cohen, (1985) went on to argue more liberally that if employees can express their opinion to their supervisor about a decision then they have “voice.” Cohen goes on to say that voiced participation increases employee loyalty, which can foster buy-in, therefore making participation one of the most important aspects of facilitating change.

Empowering employees through participation is another way to create the buy-in necessary to implement change processes because empowerment includes both aspects of choice and voice. Empowered employees involved in defining a change effort, gathering information on the change, and providing alternatives also have the power to actually make the change decision (Bartunek, Greenberg, & Davidson, 1999). Regardless of the actual overall effectiveness of the change outcome, adoption of the change initiative by the participating employees will be positive (Bartunek, et al., 1999). Pasmore and Fagans, (1992) suggest, “Many

failures or disappointments in organizational development [or organizational changes] may be traced to ineffective participation” (p. 377). For this reason, participation as a facilitation strategy for organizational change should be included in this meta-analysis.

Communication

Also widely used is the communication strategy, which can be defined as using communication through formal and informal communication channels as a way to facilitate the change process. All companies are forced to use communication as a means to implement changes by either telling or not telling employees the details about an imminent organizational change. However, communication can be used as the strategy to actually facilitate the change process. The type of communication strategies that organizations use can range depending on various communication variables. These variables are based upon the formality or informality of the communication (Stohl & Redding, 1987) and the communication quality and acceptance (Johnson & Meyer, 1997), which is based upon the amount of reduction in uncertainty (Schweiger & Densi, 1991; Johnson, 1990).

According to Stohl and Redding, (1987), each organization has two types of communication within it, formal and informal. The first type, formal communication may include items like correspondence, memos, emails, phone calls, and company newsletters. Formal communication can be very structured in nature and is viewed as an outgrowth of formal structure. Communication structure determines what enables action and provides the framework within which innovation can occur (Johnson, 1993). Jablin (1987) describes formalization as “the degree to which behaviors and requirements of jobs are explicit” (p. 405). Thus, in terms of communication, formalization involves explicit behaviors and requirements within the organization to expedite the flow of information. Managers use formal communication to build

trust and rapport with employees and to motivate them regarding organizational changes (Gopinath & Becker, 2000).

Contrary to formal communication, informal communication is more loosely structured within the organization and therefore makes it more difficult to study, as noted by the lack of research in this area. Informal communication includes the communication that takes place among peers, informal work groups, and social arenas. A person's influence, power, and potential impacts on organizational changes through the use of informal communication are based upon the individual's prominence and range (Burt, 1991). Prominence represents an individual's status within an organization, while range is an indication of an individual's weak ties in a network (Burt, 1991). In other words, an individual can have a major impact upon the acceptance of new innovations or organizational changes because of their networking ties and status within the organization. As Johnson and Meyer, (1997) point out, "Often individuals are strategically located in a network of informal structures where they can act as champions for new ideas [or change initiatives] (p. 324)."

Along with formal and informal communication, the quality of communication, meaning open and direct communication up and down the chain of command, can directly relate to its acceptance. Some researchers (Johnson, 1990; Nutt, 1986) have found that those individuals with a broader awareness of the consequences and implications of an innovation or organizational change are more likely to accept and facilitate it. In addition, by reducing the amount of uncertainty, communication can break down barriers to innovation and changes caused by fear or lack of knowledge (Johnson, 1990). There is, however, an argument that exists that says that in the face of organizational changes, managers should not communicate openly with employees. "It has been suggested that such communications might alert competitors or

cause employees to leave an organization rather than endure painful changes (Schweiger & Densi, 1991, p. 111). However, Schweiger and Densi went on to find in their research that during a merger of two companies, a change considered to be very disruptive and stressful to the normal working environment, open and direct communication with employees produced a significant positive relationship in the reduction of dysfunctional outcomes.

The use of communication, both formal and informal, and its acceptance by employees as a means to reduce uncertainty continues to be a facilitation strategy commonly used by managers to implement organizational change. Therefore, it is practical that communication as an implementation strategy be included in this meta-analysis.

Diffusion Practices

Another strategy that can be used is diffusion practices, which is the act of moving the change throughout the organization. While this particular facilitation strategy overlaps considerably with the participation and communication strategies that were discussed earlier, there are a number of other distinct actions that make this a unique strategy. One common method that is used by organization leaders is a transition team. These transition teams typically consist of a cross-section of organizational members. The members of the group are charged with promoting the change in their work groups and helping to customize the actual change to the work groups. Ness and Cucuzza (1995) provided an example of how a transition team was used to help Chrysler diffuse the use of activity-based costing throughout its organization. The transition team, consisting of members from finance, manufacturing, engineering, and information systems, persuaded work group members to experiment with the new costing system, taught the principles of the accounting system, and set up a pilot program.

Why is the use of the team and diffusion strategies helpful? They are helpful to provide a smooth transition during the change implementation process. This may be accomplished by using outside sources such as consultants or by compiling a team from select areas within the organization. By using an internal team, diffusion practices may actually incorporate participation strategies into the overall scheme of implementation.

Human Resource Management (HRM) practices

Similar to formalization practices, HRM practices may be used to implement change processes and include evaluation, appraisals, compensation, interviewing. Specifically, these strategies are used to reinforce, both positively and negatively, the behaviors associated with the change. Basically, organizational leaders are encouraged to align the HRM practices with the behaviors that are desired when the change is implemented. For instance, training can be used to facilitate change and enhance team performance. Once an employee is trained and now has the skills necessary for new tasks that stem from the change, the fear that generally accompanies the uncertainty of the change is diminished greatly and the employee may more readily adopt the change that is being implemented. Understanding the new role and the feeling of confidence can potentially enhance team performance after the change occurs. On another note, training can potentially reduce the turnover of employees that generally occurs leading up to and following an organizational change. According to Cascio (1998), turnover can have disastrous impact upon an organization going through change, HRM strategies like training and investing more resources into people “are being used more and more by more firms that are trying to hang on to valued employees as they steer through bankruptcy [or other major changes] reorganizations” (p. 609).

Performance appraisal is another common method used to reinforce change. In fact, the role of feedback and appraisals in guiding work behavior has been documented in both field and laboratory settings (Lepsinger & Lucia, 1997; Guzzo, Jette, & Kattzell, 1985; Ilgen & Moore, 1987). In an effort to facilitate a change, a large financial organization was able to focus the efforts of leadership and employees on a new set of customer-focused goals by incorporating the organizations' objectives into the performance appraisal system (Lepsinger & Lucia, 1997). Not only did this organization facilitate the change using performance appraisals, senior leaders made it clear that those not willing to make the change were free to leave with a substantial severance package suggesting that selection (i.e., self-selection to leave) may also be incorporated into the change process.

Rites and Ceremonies

Almost all organizations during major organizational changes use rites and ceremonies to provide the formal grounds to introduce or conclude an organizational change. For example, a groundbreaking ceremony for a new facility possibly as a result of a merger can mark the beginning of changes about to take place within an organization. At the other end of the spectrum, a going-away party can mark the conclusion of a major outsourcing change by providing employees a chance to say farewell. Both of these examples are formalization activities and establish within the employees the frame of mind necessary to adopt and accept major organizational changes. Many researchers feel that employees need these types of activities to internally say to themselves that the change is now in effect and they can put the old way behind them. It marks the end of the old and the beginning of the new.

Inter-Organization Relationships

Finally, inter-organization relationships can be used to implement change processes.

Using political allies, supervisor/subordinate relationships, and relationships across various work functions can help coordinate and ease the change process (Griffin, 1999).

Formalization Practices

Next, formalization practices include activities like updating job descriptions or revising the organizational structure and hierarchy. These activities are necessary in order to implement the change and make it policy. They provide the framework upon which to conduct business after the change process has taken place. Some researchers argue that formalization practices put finality on change decisions. Once a change is formally implemented into the normal day-to-day operations, change acceptance occurs (Cascio, 1998).

Outcomes

For the most part organizational changes should result in positive organizational outcomes. Hence, the most useful implementation strategies should result in positive gains for organizations and individuals. There have been arrays of organizational outcome measures used to gauge the success of organizational change efforts. Organizational outcomes have been measured using production criteria such as the volume of goods and services produced, their costs, their quality or product defects, and other similar outcome measures. Taking a broader perspective, the effectiveness of a change effort has been inferred when fewer safety problems are noted, less absenteeism occurs, less turnover occurs, or employees progress and develop, assuming that as employees progress they make more significant contributions to the organization. Beyond these objective outcome measures, researchers have also indicated that

there are attitudinal factors that should result when organizational change efforts are successful. For instance, positive changes in an employee's attitude toward the organization and an increase in job satisfaction are common measurements. Additionally, positive outcomes of acceptance or adoption to the implemented change should occur.

To reflect the array of organizational outcomes that have been measured in the literature, three types of organizational outcomes were considered within the scope of this meta-analysis. First, productivity outcomes have been considered. These outcomes refer to objective measures of the organizations effectiveness (e.g., financial performance, production quantity, production quality). Second, appropriate behavioral outcomes are considered. Behavioral outcomes refer to the observed or self-reported behaviors that result when the change is implemented such as job performance or turnover. Finally, attitudinal outcomes were considered. These attitudinal outcomes refer to the attitudes people have toward their work environment (e.g., job satisfaction and organizational commitment). Presumably, the display of positive attitudes translates into performance and positive organizational outcomes. The attitudinal outcomes are self-reported by the employees while the productivity outcomes and behavioral outcomes are typically objective measures garnered from an independent party (e.g., profit reports, supervisor).

Objective Productivity Measures

The first outcome measurement, objective measures, looks at performance criteria that can be physically measured. These measurements are made at the employee or unit level. Examples of outcome measurements include an increase in production of a product, the number of grievances, turnover rates, absenteeism, and objective measures of adoption.

Behavioral - Supervisor-Related

Supervisor-related outcomes were items that could be measured or evaluated by a supervisor. Examples may include items such as performance reports and employee-protégé relationships.

Attitudinal - Self-Reports

Self-reported outcomes, the last category, are measurements based upon self-evaluations usually through the use of questionnaires and interviews. Examples of self-report outcomes may include career intentions such as intent to quit or intent to remain, positive or negative attitudes or commitment to the organization, change in performance, change adoption, and changes in personality.

Moderators

A review of the organizational change literature (Aiken & Hage, 1971; Kaluzny, Veney, & Gentry, 1974; Kimberly & Evanisko 1981; Baldrige & Burnham, 1975; Damanpour 1987) indicated that several variables might exist that moderate the relationship between the specific change implementation strategies and organizational outcomes. These moderators could be grouped into two general categories. They were the type of (a) organization involved, and (b) change implemented. These elements seemed appropriate because they are logically related to all organizational changes in that they represent the essential dimensions of any organizational change such as where changes occur (i.e., the organization) and what is involved (i.e., the proposed changes). Therefore, salient characteristics of the organization and the change were evaluated in order to determine the moderating influence these factors had on the facilitation strategy-outcome relationship.

Organization Characteristics

Organizational factors include the organizational size like small, medium, or large and organizational type to include public or service. Also included are the sample types like managerial versus non-managerial study participants.

Organizational size and how it relates to change adoption has been an ongoing debate among researchers. Many researchers (Aiken & Hage, 1971; Kaluzny, Veney, & Gentry, 1974; Kim, 1980) argue that larger organizations undergo and adapt to organizational change more readily than smaller organizations. Kimberly & Evanisko (1981) found that size is positively related to adoption of both technological and administrative change innovations. Baldrige & Burnham, (1975) divided their empirical study into small and large organizations based upon the number of employees where fewer than 1,000 employees was considered small and 1,000 or more employees was considered large. They found significant empirical results that support the argument that increased size and complexity positively related to change innovation. These researchers concluded that large organizations, although more complex, have more diversity and the necessary resources available that may help foster change initiatives. More resources help overcome and make tolerable the impacts of losses from unsuccessful change innovations.

On the other hand, some empirical studies have shown that large organizations can inhibit or have no effect on change adoption (Mohr, 1969; Utterback, 1974). Damanpour (1987), found no significant relationship between organizational size and the adoption of technological, administrative, and ancillary change innovations. Haveman (1993) who based the size of the organization on the number of employees as well as the financial assets of the banking organizations being studied, concluded in her empirical study on organizational size and change innovation that large organizations may adopt change more readily than small organizations at

first, but then become much slower in change adoption once they become too large. She attributed the slower adoption to problems with communication within the organization. The large organizations required more complex and formal types of communication, whereas small organizations use a more informal type of communication and dissipated information throughout the organization much quicker (Haveman, 1993). Other causes on why large organizations adopt change slower than small organizations are attributed to complexity and the problems associated through coordinating, control, and management (Blau, 1970).

Other organizational factors are whether an organization operates as a public or private company. Although public companies may or may not be profit oriented, generally they are non-profit. As a result, they tend to be more bureaucratic in nature. According to Haveman, (1993), the more bureaucratic and rigid a company is, the slower change adoption will occur.

Bureaucratic companies may use standard operating procedures, formalized organizational actions, and a more categorized type of decision-making technique. These traits make the company rigid and less susceptible to change adoption.

Private companies are generally more profit-driven and continually look for innovative change ideas in order to remain competitive in the marketplace. As a result, private companies are usually geared to change adoption more than public companies.

The last category of organizational factors is in the makeup of the study participants. The outcomes of the empirical study may be impacted based upon whether the participants were taken from managerial, non-managerial or a mix of employees. Studies that include responses from solely managerial or non-managerial participants may greatly impact the outcomes as a result of bias based upon the viewpoints of the participants. A more desirable makeup would be one of mixed participants to get the whole organization concept views.

Change Characteristics

The change factors as outlined in this meta-analysis consist of change types like outsourcing, reorganization, and major policy changes. They also include the change context of whether the environment is a service or manufacturing organization.

Historically researchers categorized change types into various categories including technical versus administrative and radical versus incremental changes (Damanpour, 1987; Dewar & Dutton, 1986; Kimberly & Evanisko, 1981). Technical and administrative changes vary based upon the group of people adopting the changes. Kimberly & Evanisko, (1981) states,

Given that production processes on the one hand and administrative processes on the other in hospitals [or other organizations] involve different demands and constraints, and given that they may involve different decision making structures with decisions about innovation adoption perhaps being made by different individuals or groups of individuals, there is no reason to believe a priori that the factors explaining innovation adoption in the two cases will be identical (p. 692).

Radical innovations generally occur over a short period of time and include many new change innovations. According to Dewar & Dutton, (1986), “radical innovations incorporate large degrees of new knowledge, organizational complexity and the depth of the organization’s knowledge resources (p. 1423).” While on the other hand, incremental changes happen over extended periods of time with small innovative change steps occurring one after another. Incremental changes may even be transparent to the employees within the organization and acceptance of the change may not even be an issue. “Complexity and knowledge depth should be less important for incremental innovations (Dewar & Dutton, 1986).”

These historical classifications were changed for this meta-analysis in order to identify and group the moderator effects on the studies according to the severity of the impact of the change upon the employees within the organization. The impact on the employees is felt to directly relate to how adaptive an organization may be toward a given change. Outsourcing is

classified as the most severe because of the potential loss of jobs in entire work areas to outside contractors. If outsourcing were classified under previous researchers' categories then outsourcing would fall under radical changes since it takes place in a relatively short period time and are substantial in their change impact. Outsourcing could be either technically oriented, administrative, or a combination of these two. Reorganization is next in severity, but may or may not include the loss of employment by the individuals within the organization. If reorganization were classified under traditional categories, then it would fall under radical changes, like outsourcing, since it takes place in a relatively short period of time as well and the impacts can be substantial. Also like outsourcing, reorganization may be either technically oriented, administrative, or a combination of these two. The least severe change is major policy changes, which may be the most positive to change adoption because of its incremental nature. A major policy change would be classified under an incremental change because it is generally less severe in nature and results in small incremental organizational changes as the name implies. Major policy changes may be either technical, administrative, or both as well.

The change context of whether the organization is service oriented or manufacturing oriented is thought to have a potential moderator effect on the outcomes of the studies. This issue is really more a focus on the centralization of authority. A service-oriented organization is more likely to be decentralized in its authority because of the close proximity to the customer, while a manufacturing organization is more likely to be centralized as decision making power remains near the top of the hierarchy. There is discrepancy in the literature on which is more adaptive, centralization or decentralization. Aiken & Hage, (1970) argue that decentralization, as in the service organizations, facilitates decision making at the lower levels, exposes more ideas to those making the decisions, and better communicates the information about a change

innovation. Centralization, as argued by Zaltman, Duncan, & Holbek (1973), facilitates the adoption better by reducing conflict and retaining the authority to enact the change. If both of these are correct, then the effects of centralization based upon whether an organization is service or manufacturing may cancel each other out (Dewar & Dutton, 1986).

Summary of Journal Literature

Together these three areas of strategies, outcomes, and moderators make up the process to facilitate organizational change. Although somewhat complex, the change process generally will fall under one of these specific facilitation categories and outcomes can be measured after taking into account the moderators involved. To evaluate the effectiveness of the implementation strategies used, each study was classified and evaluated against other studies in the same classification. Although it was impossible to include all the possible combinations of strategies, outcomes, and moderators, enough studies were found and evaluated to give adequate results across the similar studies to enable a more generalizable finding.

III. Methodology

Identification of Studies

The data collection began by collecting all of the relevant studies from two recent reviews on organizational change (Armenakis & Bedian, 1999; Weick & Quinn, 1999) and reviewing the publications of the Academy of Management's Organization and Consulting division members from 1997-1999 (Sheanin & Rohan, 2000).

Although searches were geared toward the most recent organizational change studies, from 1990 to the present, older research studies were not necessarily excluded. Computer-based searches were conducted using Psych Info, ABI/Inform, Business and Industry, EBSCO, FirstSearch, and Dissertation Abstracts. The Defense Technical Information Center (DTIC) was also searched for relevant studies. Beyond these electronic databases, three Internet search engines, AOL.com, Yahoo.com, and MSN.com were used to locate studies. These searches were done using the following key terms: organizational change coupled with adoption, diffusion, effectiveness, implementation, or institutionalization; organizational development coupled with adoption, diffusion, effectiveness, implementation, or institutionalization; and innovation coupled with adoption, diffusion, effectiveness, implementation, or institutionalization. In addition, the terms associated with the particular change facilitation strategies were also used as key words. For instance, organizational change was coupled with communication and organizational change was coupled with participation. Meta-analysis was searched to find out if similar studies have already been accomplished. Although not applicable to finding studies for this meta-analysis, "Validity generalization" a term commonly used by early researchers rather than meta-analysis was searched to find existing and related meta-analyses (Guzzo et al., 1987).

To further identify relevant studies, the reference list for each currently selected study was examined to identify more potential studies. Finally, researchers were contacted for studies and papers that may not have appeared in published outlets through a posting on the Academy of Management's Management Consulting Division and Organization Development and Change Division (ODCNET-L is the list serve) networks. The message posted on the network is presented in Appendix C. Essentially, researchers were asked to contact this author with citations or documents that could be included in this study.

Selection of Studies

Studies were evaluated systematically before they were included in this study. A series of simple questions were answered regarding each study in order to narrow down the selection for interpretability across the chosen studies. Studies were included if they met the following criteria: (a) the dependent variable was some criterion that indicated the effectiveness or level of adoption of the change, (b) the analysis was at an individual level, not an organizational level, (c) the study reported sample size, and (d) the study reported Pearson correlation coefficients or statistics that could be transformed into point-biserial correlations. See Figure 2.0 "Study Selection Decision Tree" for the decision questions used to narrow down the selection.

The computer searches identified 378 potential abstracts/studies that matched the selected keywords and were qualitative in nature. Many studies were eliminated after a brief scan because of insufficient data or irrelevance to the meta-analysis. Nine potential studies were recommended through the solicitation message sent out to organizational change researchers. The initial review of the research literature identified a total number of 122 studies, 104 were from journals and books, and 18 were unpublished. Using the decision tree analysis for the 122

initial studies, 29 studies provided adequate data and met the qualification questions posed in the decision tree. From these 29 studies, two were eventually eliminated when it became apparent that they were a result of the same set of data used to publish similar articles in different journals. Three more studies were later eliminated because the facilitation strategies used for the change process were not clearly stated or apparent by the authors. The final study count selected for the meta-analysis was 24 studies. An asterisk in the reference list notes them.

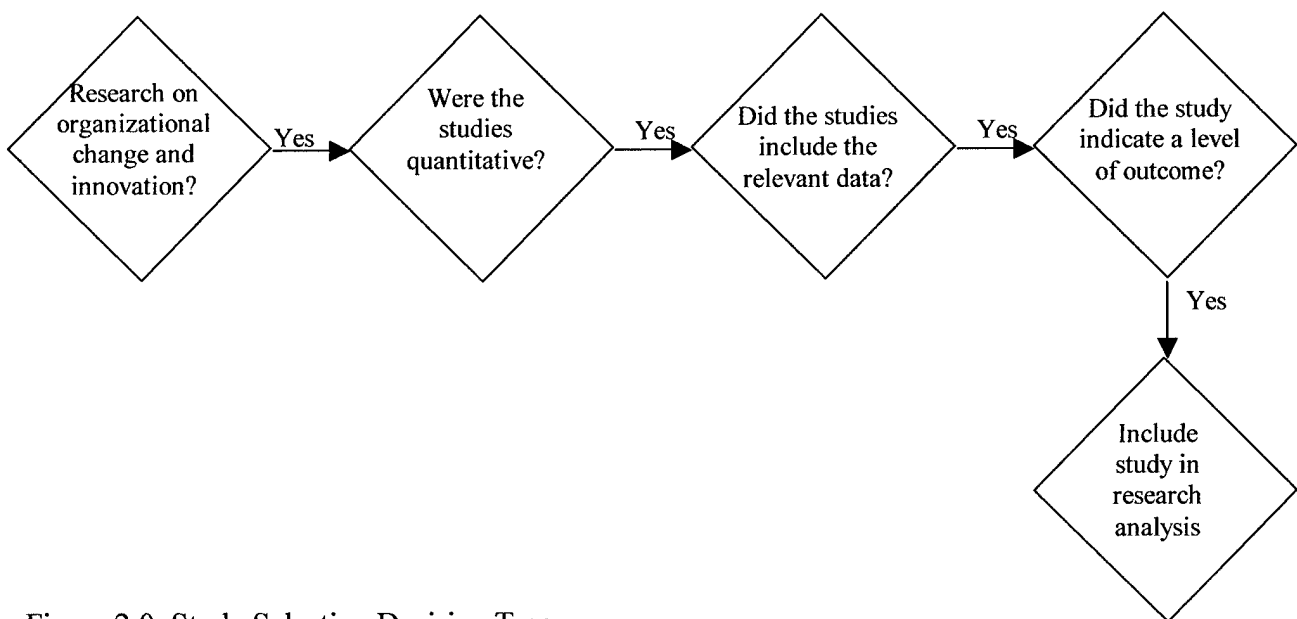


Figure 2.0 Study Selection Decision Tree

Coding

The following information was coded from each empirical study: (a) the change facilitation strategy, (b) the study characteristics, (c) the outcome criteria, and (d) the moderators (i.e., context factors, content factors, and individual factors). In no case were the coding areas forced into categories. Instead, studies were coded only when authors provided unambiguous and precise information.

The change facilitation strategy was coded two different ways. First, the specific facilitation strategy that was used was recorded when available. For instance, for a given strategy it was recorded in one of three ways either by objective organizational measurements, evaluation from the supervisor measuring performance, or by self-evaluation methods. Next, influence strategies were coded using a framework that was based on the change facilitation strategies that were suggested by Armenakis et al., (1999). These were (a) participation by those affected, (b) communication, (c) formalization practices, (d) diffusion programs, (e) alignment of human resource management practices, and (f) symbolic actions like ceremonies. Unlike Armenakis et al. (1999) who identified three different types of communication strategies, all communication strategies were initially lumped into one category under the assumption that authors would not differentiate between the particular strategies (e.g., persuasive communication, internal communication, and management of external communication).

Study characteristics refer to the sample size, study design, sampling strategy, and overall rigor (cf. Donovan & Rodosevich, 1999; Neuman, Edwards, & Raju, 1989). Sample size was simply the size of the sample that was reported in the study. Study design was classified as cross-sectional, longitudinal, experimental, quasi-experimental, or unknown. Sampling strategy was classified as census, random, stratified random, convenience, or unknown. To create a composite score that captured these characteristics and indicated the overall rigor of each study, a six-item checklist that was similar to those presented by Donovan & Rodosevich, (1999) and Neuman et al., (1989) was used. The checklist was composed of dichotomous items that reflected the characteristics of high-quality studies. Thus, we examined each study to determine if the researchers used (a) a longitudinal or experimental design; (b) a .05 level of significance (or less) to test relationships; (c) a sample size larger than 30; (d) random selection strategy to

select participants; (e) representative sample of the population; and (f) random assignment strategy to assign participants to experimental conditions. Scores for the overall study rigor were computed by summing the number of items present for each study; therefore, scores range from zero to six.

The outcome criteria from the studies were coded into the following dimensions: objective productivity measures, behavioral supervisor-related performance, and attitudinal self-rated performance. The productivity dimension can include only objective criteria (e.g., amount product produced, absenteeism, and turnover rates) that are measured at the employee or unit level. The supervisor and self-rated performance can be measured on various subjective scales. Reliability measures like Cronbach's Alpha were recorded for each variable if they were reported in the study.

To investigate potential moderators, the following information was coded from each empirical study: (a) sample type (non-managerial, management employees, mixed), (b) change type (i.e., downsizing, outsourcing, reorganization), (c) organization type (i.e., public, private, profit, non-profit), (d) change context (i.e., type of organization such as manufacturing or service), (e) and organization size (i.e., small, medium, or large). These moderators are included for the benefit to guide managers that are trying to select an appropriate influence strategy as it may apply to their own organization. A summary of the information coded, categories, and definitions are presented in Table 1.0.

Table 1.0

Study Coding Definitions

| | Keyword | Description |
|-------------------------------------|-----------------------------------|---|
| 1. | Study # | Refers to the numbered order of the studies as they appear in the selected studies binder. |
| 2. | Source | Refers to the author(s) of the selected study. |
| Change Facilitation Strategy | | |
| 3. | Facilitation Strategy: | Refers to the type of influence strategy used to facilitate the organizational change. |
| a. | Participation: | The organization primarily used an active participatory process of its managers and employees to facilitate and implement the change process. Examples are vicarious learning and participative decision- making. |
| b. | Communication: | The organization primarily used communication throughout the organization to facilitate and implement the change process. Examples are speeches by change agents and articles in employee newsletters. |
| c. | Formalization Activities: | Demonstrating the support of the change activity through new organizational structures and revised job descriptions. |
| d. | Diffusion Practices: | Using transitions teams and/or best practice programs to implement a change. |
| e. | HRM Practices: | Strategies used to reinforce, both positively and negatively, the behaviors associated with the change. Examples are selection, performance appraisal, compensation, and training and development. |
| f. | Rites and Ceremonies: | The use of symbolic activities to implement the change. |
| g. | Inter-Organization Relationships: | Using supervisor/subordinate relationships and relationships across various work functions to coordinate the change efforts. |
| Study Characteristics | | |
| 4. | Sample Size: | Refers to the size of the sample used in the study taken from within the population (organization). |
| 5. | Study Design: | Refers to how many times the study sample measures were taken. (Could be more than one of the designs below. An example is a longitudinal field experiment) |
| a. | Cross-section: | Sample measures taken only one time. |
| b. | Longitudinal: | Sample measures taken at least twice over a specified time lapse between measurements. |
| c. | Experimental | The research design used a control group to compare with the subject group. |
| d. | Field Experiment | The experiment was performed in the field rather than in a controlled lab setting. |
| e. | Unknown | The design of the research is not indicated in the study. |
| 6. | Sampling Strategy: | |
| a. | Census: | Survey distributed to all within the organization (usually includes a response rate). |
| b. | Random: | Survey or experiment randomly selected the participants. |
| c. | Stratified Random: | Identified categories like ethnic group or sex and then randomly selected participants. |
| d. | Convenience: | Captive audience for survey. (Examples are classroom or conference attendees). |
| e. | Unknown: | Information as to the type of sampling strategy used was not given. |

Table 1.0 (Continued)

| | Keyword | Description |
|---|-------------------------------------|---|
| 7. | Rigor Score: | A checklist composed of dichotomous items that reflect the characteristics of high quality studies. 1-point is given for each category present in the study. Scores can range from zero to a maximum of six. The categories are as follows: |
| | a. Design: | The study used a longitudinal or experimental design type. |
| | b. Significance: | A 0.05 level of significance (or less) was used to test the relationships. |
| | c. Sample Size: | A sample size of 30 or larger was used. |
| | d. Selection: | A random selection strategy was used to select participants. |
| | e. Population: | A representative sample of the population was used. |
| | f. Assignment: | A random assignment strategy to assign participants to the experiment was used. |
| Outcome Criteria – Organizational Adoption Measures | | |
| 8. | Objective or Productivity Outcomes: | Includes items that can be measured objectively. Examples are amount of product produced, absenteeism rates, number of grievances, objective measures of adoption, and turnover rates. Measured at the employee or unit level. |
| 9. | Supervisor-related Outcomes: | Examples are employee-protégé relationship, and performance ratings from supervisor. |
| 10. | Self-rated Performance Outcomes: | Examples are self-reported performance, self-report adoption, positive or negative commitment to organization, career intentions or intent to quit, organizational perceptions, job satisfaction, and a change in personality. Could also include resistance from sabotage, tardiness, and lack of participation or withdrawal. |
| Change Moderators: Organizational and Change Factors | | |
| 11. | Sample Type: | Indicates the job type role of the participants in the study sample. |
| | a. Non-managerial | The sample primarily used non-management production employees. |
| | b. Management | The sample primarily used employees in a managerial role. |
| | c. Mixed | The sample used a mix of managerial and non-managerial employees. |
| | d. Students | The sample primarily used students. |
| 12. | Change Type: | Refers to the severity or size of the change and its impact on the organization. |
| | a. Outsourcing: | The most severe of changes for employees that calls for the shift of work functions to another organization. Usually results in a loss of one's job, rehiring under new management, and/or early retirement. |
| | b. Downsizing: | Also, usually severe for most employees, downsizing involves reducing the actual number of employees. Remaining employees usually take on more responsibility through job consolidation and a flattening of the organizational chart in order to continue to achieve organizational objectives. |
| | c. Reorganization: | A major change that may or may not include the loss of jobs. Reorganization shifts workloads, flattens the organization, and can reduce personnel through incentives to leave or retire early for any positions that may be eliminated. |
| | d. Major Policy Change: | Can range in severity. Policy changes can be a change in the organization that can effect an employee's benefits, job responsibility, or status. A positive example is the implementation of a Gainsharing program, while a negative example may be the elimination of health care benefits. |

Table 1.0 (Continued)

| | Keyword | Description |
|-----|----------------------|--|
| 13. | Organization Type: | Refers to the type of organization under study. (May be more than one. Examples are Public/Non-Profit or Private/Profit). |
| a. | Public: | Organization under government domain. (Examples are DOD, Fire Protection, Police, Forestry Service...etc). |
| b. | Private: | Privately owned business organizations. (Examples are Coca-Cola, IBM, Motorola, Nintendo...etc). |
| c. | Profit: | Organizations that are profit motivated or that must make a profit within a given period of time to stay in business. |
| d. | Non-Profit: | Organizations that receive donations, grants, Federal and/or State funding, or operate without a profit motivated incentive. |
| 14. | Change Context: | Refers to the context arena of the organization in which the change is taking place. |
| a. | Service: | The organization is primarily service oriented. |
| b. | Manufacturing: | The organization primarily manufactures goods and products. |
| 15. | Organizational Size: | Refers to the size of the organization (population) under study, not necessarily the same as the sample size. |
| a. | Small: | An organization of 50 employees or less. |
| b. | Medium: | An organization between 51 and 500 employees. |
| c. | Large: | An organization of 501 employees or larger. |

Coding Validation

Consistent with other meta-analysis, the coding was validated using the following steps. The principal researcher first coded the selected articles according to the definitions set forth. To test the completeness and interpretation of the definitions, a pre-coding exercise was accomplished. One independent judge coded a sample of two studies selected at random and compared their results with the principal researcher. An inter-rater agreement of 86% was found over 34 areas of coding. The problem areas were identified and the definitions revised. Since perfect reliability of 100% in coding is difficult to attain, reliability figures that are 80% or greater were considered acceptable. (Durlak, 1995)

Once the pre-coding exercise was complete, an independent group of three judges re-coded a random sample of articles so that a final estimate of inter-rater agreement could be examined. The judges were introduced to the coding strategy during a brief training session.

This training session included a discussion of the following: (a) the project; (b) the definition of each coding area; and (c) the coding of five representative studies randomly extracted from the sample of studies. Once the judges independently coded the five selected studies the results were compared to the coding completed by the principal researcher. In the event that the independent coding of articles was not dependable (i.e., estimates of inter-rater agreement were low), the coding rules would have been refined and the disagreements resolved through a discussion among the independent judges and the principal researcher.

Analysis

Consistent with other meta-analyses (e.g., Damanpour, 1991); the data was analyzed using Hunter, Schmidt, and Jackson's (1982) procedure. This method was chosen for several reasons. First, this method provided specific formulas for statistically cumulating effect sizes across studies. Second, it was developed specifically for use with correlational data. Third, it rests on the assumption that much of the variation in observed results is due to statistical artifacts and methodological problems rather than due to differences in underlying population correlations. Artifacts include sampling error due to studies having sample sizes less than infinity, unreliability of predictor and criterion measurement, differential restriction of range across samples, and various data reporting errors.

The formulas were used to estimate the mean correlation across studies (weighted by sample size) and the amount of variation that was due to artifacts. Then, the variance among correlations was calculated and a weighted correction made. After this correction, the correlation should represent the best estimate of the variance across the population of studies.

In the next phase, the observed relationships were evaluated to determine if moderators should be introduced into the model in order to minimize the amount of unexplained variance. This determination is made through a process where the population variance is estimated. If sampling error and other statistical artifacts explained substantial portions of the estimated population variance then the relationship was considered to be unmoderated. This was accomplished by first by calculating the observed variance and sampling error variance using the formulas as outlined by Hunter et al., (1982, p. 41-44). The observed variance minus the sampling error variance netted the population variance. According to Hunter et al., (1982), a 75 percent heuristic rule of thumb was developed to determine whether the estimated population variance was trivial. Gooding & Wagner (1985) stated that,

A limitation to the 75-percent rule, however, is that it is based on corrections for three artifacts, although researchers are often only able to correct for one – sampling error. In such situations, the cutoff has been lowered from 75 percent to 60 percent based on the observation that sampling error accounts for approximately 85 percent of the total variance when correcting for all three artifacts (p. 467).

Since this study also only corrects for one of the three artifacts, sampling error, then the 60 percent heuristic was also used as the cutoff point. That is, if 60 % of the variance observed in the correlations across studies is explained by sampling error and other statistical artifacts (e.g., unreliability in the scales), the relationship is considered to be unmoderated. In contrast, if less than 60 % of the variance observed in the correlations across studies is unexplained with the sampling error, the relationship is considered to be moderated by other variables.

Based on the results of the initial screening of the variance across studies using the 60 % rule, studies were grouped according to the moderators that were hypothesized and subgroup analyses were conducted. For example, under the correlation combination of participation strategy and job satisfaction, there exist subgroups of organizational size, small versus large, the

type of organization, profit versus non-profit, and whether the organization was service versus manufacturing as well as other subgroups. Essentially, these analyses were designed to test whether substantial differences between the mean correlations of the subgroups existed. Substantiated differences were indicators that the hypothesized moderator truly moderated the relationships (Gooding & Wagner, 1985).

Once all the subgroup variables were identified, the t-approximation test was used to determine if there were potential differences in the mean correlations between subgroups. The t-approximation test also referred to as the separate variance t-test or unequal variance t-test is based upon the assumption of unequal variances. Using the equations from Hildebrand & Ott, 1996), the t-approximation makes it possible to test the difference between the two sample subgroups with the t-distribution. Next, the degrees of freedom were calculated in order to find the rejection regions for the t-distribution, which were obtained from Hildebrand and Ott's Appendix Table 4 (p. 637). If the t-observed calculated was greater than the t-table, then the subgroup moderator being analyzed had a significant impact. If the t-observed was less than the t-table, then the subgroup moderator was rejected and no significant impact was concluded from the moderator analyzed.

IV. Results and Analysis

Results of Coding Judges - Inter-Rater Agreement

A panel consisting of the principal researcher and three independent judges coded a total of five studies. The results of the coding exercise showed that for the five selected studies coded there were a total of 284 different coding areas.

One of the judges refrained from evaluating one of the studies because it was felt that the facilitation strategy used was not readily apparent and therefore the study did not apply. Since this study was left partially blank on this particular score sheet there were three methods that the inter-rater agreement could be reached. The method is to count all 284 areas on the coding sheets including the judge's blanks. This resulted in an agreement on 231 of the coding items for an inter-rater agreement rate of 81%. The second method is to analyze the results, ignoring the blanks, and counting the remainder of coding areas. This reduced the total number of coding areas to 270. Agreement was reached on 229 coding areas for an overall inter-rater agreement of 85%. The third and final method to analyze the results is to throw the entire study out of the coding exercise and evaluate only the remaining four studies. This reduced the overall coding areas to 228. Agreement was reached on 196 items for an overall inter-rater agreement of 86%. Since all three methods resulted in an inter-rater agreement above 80%, all judges agreed that the coding criterion was valid regardless of the method used.

Selected Study Coding

Once the coding by the judges was complete and agreed upon, the principal researcher finished coding the remainder of the studies. Three tables were developed to summarize the information and are broken down into their respective categories based on (a) their facilitation

strategy used and the characteristics of the study, (b) the study outcomes, and finally (c) any potential moderators that may be present within each study. The tables of the coding results are compiled and presented in Table 2.0 – Change Facilitation Strategies and Study Characteristics, Table 3.0 - Outcome Criteria, and Table 4.0 - Change Moderators.

Table 2.0.

Selected Study Coding – Change Facilitation Strategy and Study Characteristics

| Study | Source (Authors) | Facilitation Strategy | Sample Size | Study Design | Sampling Strategy | Rigor Score |
|---------|---|-------------------------------|-------------|---------------------------|--------------------------|-------------|
| 1. | Allen & Meyer (1990) | Participation | 120 | Cross-sectional | Census | 4 |
| 2. | Bartunek, Greenberg, and Davidson (1999) | Participation | 262 | Cross-sectional | Census | 3 |
| 3. | Collins, Hatcher, & Ross (1993) | Participation | 485 | Longitudinal (2 times) | Census | 3 |
| 4. | Coyle-Shapiro & Jacqueline (1999) | Participation | 118 | Longitudinal (3 times) | Stratified Random | 6 |
| 5. | Daley & Geyer (1994) | Communication | 171 | Cross-sectional | Census | 4 |
| 6. | Daley (1995) | Communication | 183 | Cross-sectional | Census | 4 |
| 7. | Eby, Adams, Russell, & Gabby (2000) | Participation | 117 | Cross-sectional | Census | 3 |
| 8. | Gopinath & Becker (2000) | Communication | 144 | Longitudinal (Field Exp.) | Census | 5 |
| 9 a/b. | Huang & Kappelman (1996) | Participation & HRM Practices | 146 | Cross-sectional | Stratified Random | 4 |
| 10. | Hui & Lee (2000) | Participation (OSBE) | 378 | Cross-sectional | Stratified Random | 4 |
| 11. | Johnson & Meyer (1999) | Communication | 79 | Longitudinal (Field Exp.) | Census | 3 |
| 12. | Judge, Thorenson, Pucik, & Welbourne (1999) | Participation | 514 | Cross-sectional | Census | 4 |
| 13. | Latham, Winters, & Locke (1994) | Participation | 53 | Longitudinal (Field Exp.) | Convenience | 4 |
| 14. | Lau & Woodman (1995) | Participation (control) | 346 | Experimental | Convenience | 5 |
| 15 a/b. | Lyu & Roffey (1983) | Participation & Communication | 195 | Longitudinal (Field Exp.) | Census | 5 |
| 16 a/b. | Nelson, Cooper, & Jackson (1995) | Communication & Participation | 397 | Longitudinal | Stratified Random | 5 |
| 17. | Oliver (2000) | Participation | 120 | Cross-sectional | Census | 4 |
| 18. | Parker, Chmiel & Wall (1997) | Participation | 139 | Longitudinal (Field Exp.) | Census | 5 |
| 19. | Saige & Koslowsky (1996) | Participation | 232 | Cross-sectional | Census | 3 |
| 20. | Schweiger & Densi (1991) | Communication | 147 | Longitudinal (Field Exp.) | Convenience | 5 |
| 21. | Tannenbaum & Dupree-Bruno (1994) | Participation | 840 | Cross-sectional | Census | 3 |
| 22 a/b. | Wanberg & Banas (2000) | Participation & Communication | 130 | Longitudinal (3 times) | Convenience (conference) | 4 |
| 23. | Witt (1992) | Participation | 1083 | Cross-sectional | Census | 4 |
| 24. | Zeffane (1994) | Participation | 1300 | Cross-sectional | Census | 3 |

Table 3.0

Selected Study Coding – Outcome Criteria: Organizational Adoption Measures

| Study | Source (Authors) | Facilitation Strategy | Objective Productivity Outcome | Behavioral Supervisor-related | Attitudinal Self-rated Outcomes |
|-------|---|--|--|-------------------------------|---|
| 1. | Allen & Meyer (1990) | Participation (0.61) | ~ | ~ | Org. Commitment = 0.23 (0.67) |
| 2. | Bartunek, Greenberg, & Davidson (1999) | Participation (n/a) | ~ | ~ | Performance = 0.23 (0.96) (Effectiveness) |
| 3. | Collins, Hatcher, & Ross (1993) | Participation (0.77) | ~ | ~ | Implementation = 0.20 (n/a) |
| 4. | Coyle-Shapiro & Jacqueline (1999) | Participation (0.84) | ~ | ~ | Org. Commitment (T1) = 0.08 (0.78) (T2) = 0.22 (T3) = 0.37 |
| 5. | Daley & Geyer (1994) | Communication (0.74) | ~ | ~ | Intent to Remain = 0.18 (0.83) |
| 6. | Daley (1995) | Communication (0.77) | ~ | ~ | Org. Commitment = 0.53 (0.88) (Procedural Fairness) |
| 7. | Eby, Adams, Russell, & Gabby (2000) | Participation (0.74) | ~ | ~ | Change Adoption = 0.28 (0.80) (Readiness for Change) |
| 8. | Gopinath & Becker (2000) | Communication: (0.81) | ~ | ~ | Org. Commitment = 0.37 (0.90) |
| 9 a. | Huang & Kappelman (1996) | Participation (0.93) | ~ | ~ | Org. Commitment = 0.07 (0.85) Change Adoption = 0.14 (0.92) |
| b. | Huang & Kappelman (1996) | HRM Pract (0.92) | ~ | ~ | Org. Commitment = 0.00 (0.85) Change Adoption = 0.07 (0.92) |
| 10. | Hui & Lee (2000) | Participation (OSBE) (0.88) | Absenteeism = -0.11 (n/a) (from archival records) | ~ | Org. Commitment = 0.53 (0.87) Change Adoption = -0.26 (0.80) Intrinsic Motivation = 0.17(0.63) |
| 11. | Johnson & Meyer (1999) | Communication (0.89) | ~ | ~ | Change Adoption = 0.52 (0.86) Innovativeness = 0.59 (0.86) |
| 12. | Judge, Thorenson, Pucik, & Welbourne (1999) | Participation (0.66) | ~ | ~ | Org. Commitment = 0.64 (0.79) Job Satisfaction = 0.43 (0.78) |
| 13. | Latham, Winters, & Locke (1994) | Participation (0.85) | Performance = 0.47 (0.94) | ~ | Org. Commitment = 0.21 (0.90) |
| 14. | Lau & Woodman (1995) | Participation (control) (0.69) | ~ | ~ | Org. Commitment = 0.23 (0.86) |
| 15 a. | Lyu & Roffey (1983) | Participation (0.63) | | | Job Satisfaction = 0.36 (0.60) |
| b. | Lyu & Roffey (1983) | Communication (0.66) | | | Job Satisfaction = 0.67 (0.60) |
| 16 a. | Nelson, Cooper, & Jackson (1995) | Communication (uncertainty/lack of comm.) (0.83) | ~ | ~ | Job Satisfaction = -0.5211 (0.93) Mental Health = 0.4383 (0.63) Physical Health = 0.3435 (0.84) |
| b. | Nelson, Cooper, & Jackson (1995) | Participation (0.73) | ~ | ~ | Job Satisfaction = -0.6555(0.93) Mental Health = 0.3368 (0.63) Physical Health = 0.2455 (0.84) |

Table 3.0 (Continued)

| Study | Source (Authors) | Facilitation Strategy | Objective Productivity Outcome | Behavioral Supervisor-related | Attitudinal Self-rated Outcomes |
|-------|----------------------------------|---|--------------------------------|-------------------------------|---|
| 17. | Oliver (2000) | Participation (0.71) | ~ | ~ | Org. Commitment = 0.72 (0.80) Turnover = -0.20 (n/a) Job Satisfaction = 0.29 (n/a) |
| 18. | Parker, Chmiel & Wall (1997) | Participation T1 = (0.77) T2 = (0.81) | ~ | ~ | Job Satisfaction (T1) = 0.64 (0.87) (T2) = 0.60 (0.91) |
| 19. | Saige & Koslowsky (1996) | Participation (0.88) | ~ | ~ | Job Satisfaction = 0.29 (0.84) Change Adoption = 0.28 (0.87) Org. Commitment = 0.28 (0.69) |
| 20. | Schweiger & Densi (1991) | Communication (0.94) | ~ | ~ | Performance = 0.07 (n/a) 1-item Intent to Remain = 0.36 (0.91) Org. Commitment = 0.31 (0.88) Job Satisfaction = 0.23 (0.98) Org. Perception = 0.29 (0.90) |
| 21. | Tannenbaum & Dupree-Bruno (1994) | Participation (0.94) | ~ | ~ | Performance = 0.27 (0.67) Innovation = 0.18 (0.56) |
| 22 a. | Wanberg & Banas (2000) | Participation (0.72) | Turnover = -0.12 (n/a) | ~ | Job Satisfaction = 0.07 (0.88) Intent to Quit = -0.03 (0.88) Pos. Change View = 0.26 (0.85) |
| b. | Wanberg & Banas (2000) | Communication (0.87) | Turnover = -0.02 (n/a) | ~ | Job Satisfaction = 0.05 (0.88) Intent to Quit = -0.14 (0.88) Pos. Change View = 0.24 (0.85) |
| 23. | Witt (1992) | Participation (0.90) | | | Job Satisfaction = 0.37 (0.79) |
| 24. | Zeffane (1994) | Participation (0.83) | ~ | ~ | Job Satisfaction = 0.27 (0.79) |

Note: Reliability estimates appear in parentheses under the outcomes column.

Table 4.0

Selected Study Coding – Change Moderators: Organization and Change Characteristics

| Study | Source (Authors) | Sample Type | Change Type | Organization Type | Change Context | Org. Size |
|--------|---|--------------------------|--|----------------------------|----------------------------|-----------------------------|
| 1. | Allen & Meyer (1990) | Mixed | M.P.C. | Private (profit) | Manufacturing & Service | Large |
| 2. | Bartunek, Greenberg, & Davidson (1999) | Management (faculty) | M.P.C. | Public (non-profit) | Service | Large |
| 3. | Collins, Hatcher, & Ross (1993) | Management | Major Policy Change (M.P.C.) | Public/Private (profit) | Manufacturing (Industrial) | Medium |
| 4. | Coyle-Shapiro & Jacqueline (1999) | Mixed | M.P.C. (TQM) | Private (profit) | Manufacturing | Large |
| 5. | Daley & Geyer (1994) | Mixed | Reorganization | Private (profit) | Service & Manufacturing | Not stated |
| 6. | Daley (1995) | Mixed | Reorganization (consolidation & relocation) | Private (profit) | Not stated | Not stated |
| 7. | Eby, Adams, Russell, & Gabby (2000) | Mixed | M.P.C. | Private (profit) | Service (sales) | Medium |
| 8. | Gopinath & Becker (2000) | Mixed | Downsizing | Private (profit) | Manufacturing | Large |
| 9 a/b | Huang & Kappelman (1996) | Mixed | Reorganization | Private (profit) | Service | Large |
| 10. | Hui & Lee (2000) | Mixed | Reorganization | Private (profit) | Manufacturing | Large |
| 11. | Johnson & Meyer (1999) | Management | Reorganization | Public (non-profit) | Service | Medium |
| 12. | Judge, Thorenson, Pucik, & Welbourne (1999) | Management | Downsizing & Reorganization | Public (profit) | Service & Manufacturing | Medium to Larger |
| 13. | Latham, Winters, & Locke (1994) | Students | M.P.C. (schedules) | Public (profit) | Service | Large |
| 14. | Lau & Woodman (1995) | Mixed (faculty/students) | M.P.C. (bonfire tradition) | Public (non-profit) | Service | Large |
| 15 a/b | Lyu & Roffey (1983) | Mixed | M.P.C | Public (non-profit) | Service | Large |
| 16 a/b | Nelson, Cooper, & Jackson (1995) | Mixed | Outsourcing (privatization & reorganization) | Public to Private (profit) | Service (Water Authority) | Large |
| 17. | Oliver (2000) | Mixed | M.P.C. | Private (profit) | Manufacturing | Medium |
| 18. | Parker, Chmiel & Wall (1997) | Mixed | Downsizing | Private (profit) | Manufacturing | Medium |
| 19. | Saige & Koslowsky (1996) | Non-managerial | M.P.C. (incentive systems) | Public (non-profit) | Service (government) | Large |
| 20. | Schweiger & Densi (1991) | Mixed | Reorganization (merger) | Private (profit) | Manufacturing | Medium |
| 21. | Tannenbaum & Dupree-Bruno (1994) | Mixed | M.P.C. (innovativeness) | Public (non-profit) | Service (government) | Large (overall) |
| 22 a/b | Wanberg & Banas (2000) | Mixed | Reorganization | Public (non-profit) | Service | Large (85 org w/13.5av/org) |
| 23. | Witt (1992) | Mixed | M.P.C. | Public (non-profit) | Service | Large |
| 24. | Zeffane (1994) | Mixed | M.P.C. | Public (profit) | Service | Large |

Note: Major Policy Change (M.P.C.)

Effect Size (ES) and Analysis

Once the studies were completely coded, each measured outcome was categorized according to the facilitation strategy used in the change implementation process. Only three types of facilitation strategies were identified among the coded studies; they were participation, communication, and human resource management practices. Also, no supervisor-related outcomes were found in the selected studies. Table 5.0 provides a summation of the collected studies grouped according to one of the three identified facilitation strategies. Each outcome and the moderators associated with each study are also presented.

Table 5.0

Study Outcomes and Moderators Categorized by Strategy

| Strategy/Study | N | Outcomes (Objective) | (Self-Rated) | Moderators (Sample/Change/Org/Context/Size) |
|--|-----|-------------------------|--|--|
| Participation | | | | |
| Allen & Meyer (1990) | 120 | ~ | Org Commitment = 23 (67) | Mixed, Major Policy Change, Private/profit, Manufacturing/Service, Large |
| Bartunek, Greenberg & Davidson (1999) | 262 | ~ | Performance = 23 (96) | Management, Major Policy Change, Public/non-profit, Service, Large |
| Collins, Hatcher, & Ross (1993) | 485 | ~ | Implement = 20 (n/a) | Management, Major Policy Change, Public/Private/profit, Service, Large |
| Coyle-Shapiro & Jacqueline (1999) | 118 | ~ | Org Commitment (78) T1 = 08 T2 = 22 T3 = 37 | Mixed, Major Policy Change, Private/profit, Manufacturing, Large |
| Eby, Adams, Russell & Gabby (2000) | 117 | ~ | Change Adopt = 28 (80) | Mixed, Major Policy Change, Private/profit, Service, Medium |
| Huang & Kappelman (1996) | 146 | ~ | Org Commitment = 07 (85) Change Adopt = 14 (92) | Mixed, Reorganization, Private/profit, Service, Large |
| Hui & Lee (2000) | 378 | Absentee = -11 (n/a) | Org Commitment = 53 (87) Change Adopt = -26 (80) Intrinsic Motivat = 17 (63) | Mixed, Reorganization, Private/profit, Manufacturing, Large |
| Judge, Thorenson, Pucik & Welbourne (1999) | 514 | ~ | Org Commitment = 64 (79) Job Sat = 43 (78) | Management, Downsizing/Reorg, Public/profit, Service, Medium/Large |
| Latham, Winters & Locke (1994) | 53 | Performance= 47 (94) | Org Commitment = 21 (90) | Students, Major Policy Change, Public/profit, Service, Large |
| Lau & Woodman (1995) | 346 | ~ | Org Commitment = 23 (86) | Mixed, Major Policy Change, Public/non- profit, Service, Large |
| Lyu & Roffey (1983) | 195 | ~ | Job Sat. = 36 (60) | Mixed, Major Policy Change, Public/non- profit, Service, Large |

Table 5.0 (Continued)

| Strategy/Study | N | Outcomes (Objective) | (Self-Rated) | Moderators (Sample/Change/Org/Context/Size) |
|----------------------------------|------|-------------------------|---|---|
| Participation (Cont.) | | | | |
| Nelson, Cooper, & Jackson (1995) | 397 | ~ | Job Sat = -66 (93) Mental Health = 34 (63) Phys Health = 25 (84) | Mixed, Outsourcing, Public to Private/profit, Service, Large |
| Oliver (2000) | 120 | ~ | Org Commitment = 72 (80) Turnover = -20 (n/a) Job Sat = 29 (n/a) | Mixed, Major Policy Change, Private/profit, Manufacturing, Medium |
| Parker, Chmiel & Wall (1997) | 139 | ~ | Job Sat T1 = 63 (87) T2 = 60 (91) | Mixed, Downsizing, Private/profit, Manufacturing, Medium |
| Saige & Koslowsky (1996) | 232 | ~ | Job Sat = 29 (84) Change Adoption = 28 (87) Org Commitment = 28 (69) | Non-managerial, Major Policy Change, Public/non-profit, Service, Large |
| Tannenbaum & Dupree-Bruno (1994) | 840 | ~ | Performance = 27 (67) Innovation = 18 (56) | Mixed, Major Policy Change, Public/non-profit, Service, Large |
| Wanberg & Banas (2000) | 130 | Turnover = -12 | Job Sat = 07 (88) Intent to Quit = -03 (88) Pos Change View = 26 (85) | Mixed, Reorganization, Public/non-profit, Service, Large |
| Witt (1992) | 1083 | ~ | Job Sat. = .37 (79) | Mixed, Major Policy Change, Public/non-profit, Service, Large |
| Zeffane (1994) | 1300 | ~ | Job Sat = 27 (79) | Mixed, Major Policy Change, Public/profit, Service, Large |
| Communication | | | | |
| Daley & Geyer (1994) | 171 | ~ | Intent to Remain = 18 (83) | Mixed, Reorganization, Private/profit, Service/Manufacturing, Size not stated |
| Daley (1995) | 183 | ~ | Org Commitment = 53 (88) | Mixed, Reorganization, Private/profit, Not stated, Not stated |
| Gopinath & Becker (2000) | 144 | ~ | Org Commitment = 37 (90) | Mixed, Downsizing, Private/profit, Manufacturing, Large |
| Johnson & Meyer (1999) | 79 | ~ | Change Adoption = 52 (86) Innovativeness = 59 (86) | Management, Reorganization, Public/profit, Service, Medium |
| Lyu & Roffey (1983) | 195 | ~ | Job Sat. = 67 (60) | Mixed, Major Policy Change, Public/non-profit, Service, Large |
| Nelson, Cooper & Jackson (1995) | 397 | ~ | Job Sat = -52 (93) Mental Health = 44 (63) Phys Health = 34 (84) | Mixed, Outsourcing, Public to Private/profit, Service, Large |
| Schweiger & Densi (1991) | 147 | ~ | Performance = 07 (n/a) Intent to Remain = 36 (91) Org Commitment = 31 (88) Job Sat = 23 (98) Org Perception = 29 (90) | Mixed, Reorganization, Private/profit, Manufacturing, Medium |
| Wanberg & Banas (2000) | 130 | Turnover = -02 (n/a) | Job Sat = 05 (88) Intent to Quit = -14 (88) Pos Change View = 24 (85) | Mixed, Reorganization, Public/non-profit, Service, Large |
| HRM Practices | | | | |
| Huang & Kappelman (1996) | 146 | ~ | Org Commitment = 00 (85) Change Adoption = 07 (92) | Mixed, Reorganization, Private/profit, Service, Large |

Note: Decimals have been omitted for clarity. Reliabilities are reported under "Outcomes" in parentheses.

In order provide a weighted true effect size, the sample size, reliability, and reported correlations are used in the analysis. For variables that have no reported reliability from the author, the mean was used as taken from the reliabilities of all the variables in that category. For example, under the participation and job satisfaction variable their was one variable that the author did not record the reliability. The mean of the remaining recorded reliabilities for job satisfaction was used in place of the unrecorded reliability. A summary of the results of each calculated effect size analysis based upon the combinations of strategy and outcome are presented in Table 6.0 – Summary Results of Corrected Correlations.

Corrected correlations and confidence intervals were omitted if there were not at least a minimum of two of the same strategy/outcome combinations. For the facilitation strategy of participation, there were enough correlations across five outcomes to analyze for a corrected/weighted correlation and confidence intervals. The outcomes coupled with participation included job satisfaction (0.47), organizational commitment (0.51), change adoption (0.07), performance (0.39), and turnover (0.19). Significance was found for job satisfaction, organizational commitment, performance, and turnover. Contrary to many research studies, no significance was found for the correlation of participation and change adoption. Under the facilitation strategy of communication, where enough information was present, four corrected/weighted outcomes were found. All four outcomes to include communication coupled with job satisfaction (0.56), organizational commitment (0.49), change adoption (0.40), and intent to remain (0.26) produced significance results. An example of the formulas used for the statistical calculations are shown in Appendix A – Sample Calculations. Also, the results of the corrected correlations for each individual variable, the weighted effect sizes, and overall confidence intervals are given in Appendix B.

Table 6.0

Summary Results of Corrected Correlations

| Strategy and Outcome | N Total | Corrected/Weighted Correlation | Confidence Interval |
|------------------------------|------------|-----------------------------------|---------------------|
| Participation (coupled with) | | | |
| Job Satisfaction | 4,249 | 0.47 | 0.33 – 0.61 * |
| Organizational Commitment | 2,263 | 0.51 | 0.34 – 0.68 * |
| Change Adoption | 1,003 | 0.07 | -0.18 – 0.31 |
| Performance | 1,155 | 0.39 | 0.17 – 0.49 * |
| Turnover | 250 | 0.19 | 0.09 – 0.28 * |
| Communication (coupled with) | | | |
| Job Satisfaction | 869 | 0.56 | 0.12 – 0.99 * |
| Organizational Commitment | 474 | 0.49 | 0.31 – 0.66 * |
| Change Adoption | 209 | 0.40 | 0.09 – 0.71 * |
| Intent to Remain | 448 | 0.26 | 0.13 – 0.40 * |

*Denotes Significant at 0.05 level.

Moderators

An analysis of the variance in the weighted corrected correlations was conducted to identify any potential impacts from moderators. The observed variance, sampling variance, population variances were computed using the three statistical steps as outlined by Hunter, et al., (1982, p. 41-44). See sample statistics, Appendix B, for the formulas used. The sampling variance was subtracted from the observed variance to find the population variance. Using the population variance, the percent of variance was then calculated and reported in Table 7.0 - Summary Results of Moderator Effects. The 60 percent heuristic test was used to determine the impact, if any, of potential moderators and the need to further explore the moderators (Gooding et al., 1985). The percent explained under the facilitation strategy of participation was job satisfaction (5%), organizational commitment (5%), change adoption (8%), performance (38%), and turnover (100%). For the communication strategy, the percent explained was job satisfaction (4%), organizational commitment (26%), change adoption (32%), and intent to

remain (58%). It was determined from the 60 percent heuristic test that all potential moderators would be analyzed with the exception of participation and turnover in which the variance was 100 percent explained and the moderators are assumed to have no significant impact.

Table 7.0

Summary Results of Moderator Effects

| Strategy and Outcome | Total # Correlations | Observed Variance | Sampling Variance | Population Variance | Percent Explained |
|------------------------------|-------------------------|----------------------|----------------------|------------------------|----------------------|
| Participation (coupled with) | | | | | |
| Job Satisfaction | 10 | 0.027 | 0.0014 | 0.026 | 5* |
| Org. Commitment | 11 | 0.057 | 0.0027 | 0.054 | 5* |
| Change Adoption | 5 | 0.062 | 0.0049 | 0.057 | 8* |
| Performance | 3 | 0.0055 | 0.0021 | 0.0034 | 38* |
| Turnover | 2 | 0.0024 | 0.0074 | -0.0050 | 100 |
| Communication (coupled with) | | | | | |
| Job Satisfaction | 4 | 0.06 | 0.0022 | 0.058 | 4* |
| Org. Commitment | 3 | 0.014 | 0.0037 | 0.011 | 26* |
| Change Adoption | 2 | 0.021 | 0.0068 | 0.014 | 32* |
| Intent to Remain | 3 | 0.01 | 0.0058 | 0.0042 | 58* |

*Denotes correlations to be analyzed further for moderators

The next step was to analyze all potential moderators not excluded by the 60 percent heuristic test. For the purpose of simplifying the analysis some moderators were combined. For example, small and medium organizations were combined versus just large organizations. Also, because of the differing business strategy orientations of companies, profit versus non-profit was categorized in place of private versus public. Another simplification was for the combination of outsourcing and reorganizations versus major policy changes, which was based upon the severity of the change impact. The last simplification was that mixed employee participation in the study was ignored; instead management versus non-management was used as these moderators separate potential differing views within the organization.

In order to analyze each subgroup of moderators, a minimum of two corrected correlations in each category are required. Of the 40 possible subgroup areas, only 10 moderator combinations had enough correlations to conduct an analysis. From these 10 moderator combinations analyzed, four were under the facilitation strategy of participation and job satisfaction. Moderators in this category include small versus large organizational size, profit versus non-profit, service versus manufacturing, and outsourcing/reorganization versus major policy changes. Three categories under the correlation of participation and organizational commitment were analyzed to include profit versus non-profit, service versus manufacturing, and outsourcing/reorganization versus major policy changes. Two categories under the correlation of participation and change adoption were analyzed to include profit versus non-profit and outsourcing/reorganization versus major policy changes. Finally, the last category analyzed was under the correlation of communication and job satisfaction for profit versus non-profit. Table 8.0 provides all possible combinations of potential moderators as recorded in the study coding and lists the number of correlations in each category.

Table 8.0:

Moderator Combinations/Recorded Correlations of Each Combination

| Moderators | Job Satisfaction | Organizational Commitment | Change Adoption | Performance | Intent to Remain |
|----------------------|------------------|---------------------------|-----------------|-------------|------------------|
| Participation | | | | | |
| Large Org vs. | 7* | 10 | 4 | 3 | n/a |
| Small/Med Org | 3* | 1 | 1 | 0 | n/a |
| Profit vs. | 6* | 9* | 3* | 1 | n/a |
| Non-Profit | 4* | 2* | 2* | 2 | n/a |
| Service vs. | 7* | 5* | 4 | 3 | n/a |
| Manufacturing | 3* | 5* | 1 | 0 | n/a |
| Outsource/Reorg. | 5* | 3* | 3* | 0 | n/a |
| vs. MPC | 5* | 8* | 2* | 3 | n/a |
| Management vs. | 1 | 1 | 0 | 1 | n/a |
| Non-Management | 1 | 2 | 1 | 1 | n/a |
| Communication | | | | | |
| Large Org vs. | 3 | 1 | 1 | n/a | 1 |
| Small/Med Org | 1 | 1 | 1 | n/a | 1 |
| Profit vs. | 2* | 3 | 1 | n/a | 2 |
| Non-Profit | 2* | 0 | 1 | n/a | 1 |
| Service vs. | 3 | 0 | 2 | n/a | 2 |
| Manufacturing | 1 | 2 | 0 | n/a | 1 |
| Outsource/Reorg. | 3 | 3 | 2 | n/a | 3 |
| vs. MPC | 1 | 0 | 0 | n/a | 0 |
| Management vs. | 0 | 0 | 1 | n/a | 0 |
| Non-Management | 0 | 0 | 0 | n/a | 0 |

*Indicates minimum correlations available to include moderators in analysis.

Once the moderator subgroups were identified, an analysis was performed using the t-approximation test as outlined by Hildebrand & Ott (1996). In order for the moderators to show a significant impact upon the correlations, the t-observed should be greater than the t-table (Hildebrand & Ott, 1996, Table 4, p. 637). All the moderators were rejected and found to be insignificant at alpha level 0.05. See Table 9.0 – Results of t-approximation Test.

Table 9.0

Results of t-approximation Test on Moderators

| Moderators | t-approximation | c | d.f. | t-table | Test Result |
|---|-----------------|-------|------|---------|-------------|
| Participation & Job Satisfaction | | | | | |
| Large vs. Small Org | 1.099 | 0.394 | 5 | 2.571 | Null Valid |
| Profit vs. Non-Profit | 0.622 | 0.421 | 7 | 2.365 | Null Valid |
| Service vs. Manufacturing | 1.003 | 0.362 | 4 | 2.776 | Null Valid |
| Outsource/Reorg. Vs. MPC | 1.781 | 0.878 | 5 | 2.571 | Null Valid |
| Participation & Org. Commitment | | | | | |
| Profit vs. Non-Profit | 1.825 | 0.932 | 9 | 2.262 | Null Valid |
| Service vs. Manufacturing | 0.421 | 0.709 | 7 | 2.365 | Null Valid |
| Outsource/Reorg. Vs. MPC | 1.654 | 0.961 | 2 | 4.303 | Null Valid |
| Participation & Change Adoption | | | | | |
| Profit vs. Non-Profit | 0.567 | 0.988 | 2 | 4.303 | Null Valid |
| Outsource/Reorg. Vs. MPC | 0.783 | 0.902 | 2 | 4.303 | Null Valid |
| Communication & Job Satisfaction | | | | | |
| Profit vs. Non-Profit | 0.202 | 0.066 | 1 | 12.706 | Null Valid |

Summary

This chapter employed the methods as outlined by Hunter, et al., (1982) for analyzing the correlations, correcting them according to their reliabilities, and weighting them based upon the samples sizes. Participation and communication were identified as significant facilitation strategies. Participation resulted in positive outcomes for job satisfaction, organizational commitment, performance, and turnover. Participation had no significant impact upon change adoption. Communication resulted in positive outcomes for job satisfaction, organizational commitment, change adoption, and intent to remain. An analysis was conducted on potential moderators, however, due to the few number of correlations available, only 10 could actually be analyzed. All 10 subgroup moderators were found as non-significant. Based upon the lack of correlations and the final results, the moderator analysis remains questionable.

V. Conclusions

Research Questions

There were two main questions that this research was aimed at answering. The first question was: “Are there certain guidelines an organization should use to ensure a smooth transition during major organizational change efforts?” The second question was: “Are there trends of strategies used by businesses that successfully implemented organizational change, that can be applied to ease the impact felt on Air Force employees that are undergoing major change initiatives?” The answer to both of these questions is yes; there are guidelines and strategies an organization should follow to ensure smooth transitions during organizational changes like outsourcing, reorganizations, and major policy changes. According to this meta-analytic research, both participation and communication strategies provide the guidelines necessary to implement organizational changes. However, implementing these two strategies in no way guarantees that every organizational change will be successful, but across the 24 empirical studies evaluated, a positive relationship was found using these implementation strategies.

As a secondary, unintended objective, this study provided a general review of the facilitation strategy research. However, a systematic analysis of studies was often frustrated because few useable studies existed for many of the facilitation strategies. In fact, there were no useable studies for this meta-analysis found under the facilitation strategies of diffusion practices, rites and ceremonies, inter-organizational relationships, and formalization practices. Studies that were located under these strategies were usually “single-case” case studies, which did not provide the statistical information that was needed for this analysis (e.g. correlation tables of the research data).

One area of the research that remains questionable falls under the moderator analysis. All the moderator results were negative, which is inconsistent with most literature. We feel the negative results may have been from a lack of correlation data necessary for each subgroup of moderators. Only 10 of 40 potential areas could be analyzed and of those 10, many subgroups only had two correlations available. The small samples created a large amount of variance thus making the results questionable.

Air Force Implications

As stated by Durlak, (1995), “Care must be taken to offer conclusions that are specific to the literature being evaluated and consistent with any limitations that exist in the database” (p. 337). Based upon the studies identified and selected for this meta-analytic review, the conclusion of the statistical analysis and the identified key factors that moderate between influence strategies and change implementation, participation and communication were identified as two key facilitation strategies for implementing organizational changes.

For participation strategy, significant positive results were found in the combinations of participation coupled with job satisfaction, organizational commitment, performance, and turnover. For the Air Force, these results suggest that the use of participation as a facilitation strategy has the benefits of increased employee satisfaction and commitment, an increase in job performance, and a reduction in employee turnover. However, no significant result was found for participation strategy coupled with change adoption. This exception may be explained as a result of moderators. The moderators were only partially analyzed in this study because of the too few correlations available; therefore, unanalyzed moderators may still have a potential impact on the study outcomes. Basically, these results indicate that during major organizational

changes like outsourcing and reorganizations, the use of participation as a means to help implement the change may benefit the Air Force. Even though employees may not readily agree on the change or may even oppose the change entirely, by being able to participate in the process instills loyalty to the organization, increases personal satisfaction and performance, and ultimately increases employee retention.

For communication strategy, all combinations analyzed showed significant positive results. The combination results were across communication coupled with job satisfaction, organizational commitment, change adoption, and intent to remain. Similar to participation, these results indicate that during major organizational changes, communicating to employees with honest and open communication reduces uncertainty and fear about what lies ahead as a result of the upcoming change. By alleviating this fear factor, employees are more prepared to accept and adopt the new changes. As a result, like participation, communication instills loyalty to the organization, increases personal satisfaction, and increases employees' intention to remain with the organization.

Overall, the positive results from just retention and intentions to remain by using either participation or communication strategies is extremely valuable in helping the Air Force hang on to its most valuable asset, which is people. How we handle organizational change and the process of implementing the change may directly influence our ability to meet our future recruiting goals. These identified factors will be sent to the Air Force Civil Engineer Support Agency (AFCESA) for their use. If deemed applicable to the Air Force, AFCESA may use these factors as a means to develop operational guidelines for the implementation of future downsizing initiatives.

Limitations

There were several limitations to this meta-analytic review. First of all, only 24 studies were identified for this meta-analysis. This was a factor of many reasons, one being based upon the definitions and selection criteria used for study inclusion. Another reason was that most studies are not mutually exclusive in the type of strategy implemented during organizational change. More than one facilitation strategy may have been used to implement the change being studied, so identifying correlation data based upon a mutually exclusive strategy narrowed the field of potential studies that could be included. A third reason is that in general, including this research, a meta-analysis is a mathematical interpretation conducted using the empirical data of research several studies. Many publications either fail to report the statistical analysis of a study or the research is based upon a case study in which there is little or no statistical analysis necessary. As a result, only three of the seven identified facilitation strategies for use in this meta-analysis included the empirical data necessary to be included. No studies with empirical correlation data were found using the strategies of formalization activities, diffusion practices, rites and ceremonies, and inter-organization relationships. The strategies that were found were in the areas of participation, communication, and HRM practices. Of these three strategy areas, we only found one HRM practices study that was acceptable. Having only one HRM study, no analysis could be performed on this strategy.

A second limitation to this study was in the reported outcomes. Most studies used interviews or questionnaires for their research analysis that were based upon self-report measures by the individuals being interviewed. As a result, no supervisor reported outcomes were found among potential studies and only three studies included objective measures like absenteeism and turnover rates. This result may be explained from the many relationships that were actually

evaluated could have potentially been inflated because of covariance. Covariance can be caused by relationships measured with a single questionnaire collected at one point in time.

A third limitation involved the lack of correlations for the breakdown of moderators. With the limited number of correlations when moderators were broken down into categorical data for analysis only 10 of the 40 categories, or 25 percent, had the required minimum correlations to analyze. Among the 10 moderator categories that did get analyzed some of them only had two or three correlations. The small number of correlations resulted in large variances, very few degrees of freedom, and ultimately resulted in the null not being rejected. This could signify that moderators had no significant impact on the correlations, or it could be as a result of too few correlations in each category to get a significant result.

Future Research

Several potential areas for future research were identified. First, there is a lack of empirical research for the implementation strategies of human resource management, formalization activities, diffusion practices, rites and ceremonies, and inter-organizational relationship strategies. Also, since most research is conducted using a combination of these types of strategies, research should concentrate on mutually excluding one strategy from another in order to obtain a better understanding of the effectiveness of each strategy.

Secondly, most research is conducted using self-report outcomes. There is a lack of empirical studies that measure supervisor-related outcomes and objective outcomes based on increase in performance at the individual level.

A third limitation is with the environmental factors, or potential moderators, in the studies. In most cases, with the exception of participation coupled with turnover, only small

amounts of variance were explained by the outcomes. The rest of the variance may have resulted from moderators. If this was indeed the case, then this would lead us to believe that an organization's environmental factors like organizational size and type, employee mix, change type, and change context could greatly impact the outcomes in a study. However, since there were so little correlation data in each moderator category, the results of the moderator analysis are very questionable as to their accuracy. Based upon the moderator results, the moderators had no impact on the correlations. Caution is advised in assuming that this statement is correct and generalizing this across organizations. To generalize a study outcome across all organizations would be a mistake without looking at the makeup of potential moderators and reanalyzing with more correlations than just the two or three found per category in this meta-analysis. Therefore, more research is necessary in the area of potential moderators on research outcomes.

Summary of Findings

In closing, these findings clearly identified participation and communication as facilitation strategies that can be used by organizations to implement organizational changes. Although change adoption was not fully supported by the participation strategy, overall participation proved to be a valuable tool for managers of public and private business organizations as a way of producing positive outcomes in job satisfaction, organizational commitment, performance, and lack of turnover during an organizational change. Communication was found to produce significant positive outcomes for job satisfaction, organizational commitment, change adoption and intent to remain in the organization. With the Air Force community initiating a growing number of outsourcing studies, these findings are directly applicable in dealing with future organizational changes.

Final Comments

In general, this meta-analysis identified two key facilitation strategies, participation and communication, across 24 separate research studies. Initially, all 24 studies were coded and an analysis conducted using the correlation data from each study. Since conflict of positive versus negative or significant versus non-significant outcomes were found across many of the studies, the resulting true effect size was calculated based upon an overall weighted and corrected correlation. Next, an analysis to identify potential moderators was performed in which all outcomes, with the exception of participation and turnover, were identified as having potential moderators. The moderators were analyzed, but with the very few correlations available for each categorical analysis, all moderators resulted in a non-significant impact upon the outcomes.

Appendix A: Sample Calculations

Reported Correlations

Number of participants
in each study

Reliabilities of Participation

Reliabilities of Job Satisfaction

$$r := \begin{pmatrix} .07 \\ .66 \\ .43 \\ .29 \\ .63 \\ .60 \\ .27 \\ .29 \\ .36 \\ .37 \end{pmatrix}$$

$$N := \begin{pmatrix} 130 \\ 397 \\ 514 \\ 232 \\ 139 \\ 139 \\ 1300 \\ 120 \\ 195 \\ 1083 \end{pmatrix}$$

$$R_p := \begin{pmatrix} .72 \\ .73 \\ .66 \\ .88 \\ .77 \\ .81 \\ .83 \\ .71 \\ .63 \\ .90 \end{pmatrix}$$

$$R_{js} := \begin{pmatrix} .88 \\ .93 \\ .78 \\ .84 \\ .87 \\ .91 \\ .79 \\ .86 \\ .60 \\ .79 \end{pmatrix}$$

$$n := \text{rows}(r)$$

$$n = 10$$

$$\sum N = 4.249 \times 10^3$$

Using the equation for the Error of Measurement:

$$r_{\text{corrected}} := \frac{r}{\sqrt{R_p} \sqrt{R_{js}}}$$

(Hunter and others, 1982:57)

$$\text{Sqrt}R_p := \sqrt{R_p}$$

$$\text{Sqrt}R_{js} := \sqrt{R_{js}}$$

$$\text{Sqrt}R_p =$$

| | |
|---|------|
| | 0 |
| 0 | .849 |
| 1 | .854 |
| 2 | .812 |
| 3 | .938 |
| 4 | .877 |
| 5 | 0.9 |
| 6 | .911 |
| 7 | .843 |
| 8 | .794 |
| 9 | .949 |

$$\text{Sqrt}R_{js} =$$

| | |
|---|------|
| | 0 |
| 0 | .938 |
| 1 | .964 |
| 2 | .883 |
| 3 | .917 |
| 4 | .933 |
| 5 | .954 |
| 6 | .889 |
| 7 | .927 |
| 8 | .775 |
| 9 | .889 |

$$\xrightarrow{(\text{Sqrt}R_p - \text{Sqrt}R_{js}) =}$$

| | |
|---|------|
| | 0 |
| 0 | .796 |
| 1 | .824 |
| 2 | .717 |
| 3 | 0.86 |
| 4 | .818 |
| 5 | .859 |
| 6 | 0.81 |
| 7 | .781 |
| 8 | .615 |
| 9 | .843 |

Appendix A: Sample Calculations (Continued)

Corrected Correlations

$$r_{\text{corrected}} := \left(\frac{r}{\sqrt{R_p} \cdot \sqrt{R_j}} \right)$$

| | |
|---|-------|
| | 0 |
| 0 | 0.088 |
| 1 | 0.801 |
| 2 | 0.599 |
| 3 | 0.337 |
| 4 | 0.77 |
| 5 | 0.699 |
| 6 | 0.333 |
| 7 | 0.371 |
| 8 | 0.586 |
| 9 | 0.439 |

To figure the "Weighted Average Mean" across studies based upon sample size:

$$R_{\text{barcorrected}} := \frac{\sum (N_i r_i)}{\sum N}$$

(Hunter and others, 1982:41)

Unweighted mean

$$r_{\text{bar}} := \text{mean}(r_{\text{corrected}})$$

$$r_{\text{bar}} = 0.502$$

$$r_{\text{barcorrected}} := \frac{\sum (N \cdot r_{\text{corrected}})}{\sum N}$$

$$r_{\text{barcorrected}} = 0.468$$

$$S := \sqrt{\text{Var}(r_{\text{corrected}})}$$

$$S = 0.227$$

$$\text{var}(r) = 0.031$$

$$S_{\text{ErrorCI}} := \frac{S}{\sqrt{n}}$$

$$S_{\text{ErrorCI}} = 0.072$$

Appendix A: Sample Calculations (Continued)

$$\alpha := .1, .09, .01$$

$$LBC(\alpha) := \bar{r}_{corrected} - S_{ErrorCI} \left| qt\left(\frac{\alpha}{2}, \sum N - 1\right) \right|$$

$$UBC(\alpha) := \bar{r}_{corrected} + S_{ErrorCI} \left| qt\left(1 - \frac{\alpha}{2}, \sum N - 1\right) \right|$$

| $1 - \alpha =$ | $LBC(\alpha) =$ | $UBC(\alpha) =$ |
|----------------|-----------------|-----------------|
| 0.9 | 0.35 | 0.586 |
| 0.91 | 0.346 | 0.59 |
| 0.92 | 0.342 | 0.593 |
| 0.93 | 0.338 | 0.598 |
| 0.94 | 0.333 | 0.603 |
| 0.95 | 0.327 | 0.609 |
| 0.96 | 0.32 | 0.615 |
| 0.97 | 0.312 | 0.624 |
| 0.98 | 0.301 | 0.635 |
| 0.99 | 0.283 | 0.653 |

Confidence Interval for Alpha @ 0.05 is equal to $0.327 < \bar{r} < 0.609$

OBSERVED VARIANCE

(Hunter et al., 1982, p. 41-44)

$$\sigma_{rsq} := \frac{\sum \left[N \cdot (\bar{r} - \bar{r}_{corrected})^2 \right]}{\sum N}$$

$$\sigma_{rsq} = 0.027$$

ESTIMATE OF SAMPLING ERROR VARIANCE

n is equal to the number of correlations $n = 10$

$$\sigma_{esq} := \frac{\left[n \cdot (1 - \bar{r}_{corrected})^2 \right]}{\sum N}$$

$$\sigma_{esq} = 1.436 \times 10^{-3}$$

POPULATION VARIANCE = (Observed Variance - Sampling Error Variance)

$$\sigma_{psq} := \sigma_{rsq} - \sigma_{esq}$$

$$\sigma_{psq} = 0.026$$

PERCENT EXPLAINED = 1 - (Sampling Error/Observed Variance)

$$\text{percentexplained} := \left(1 - \frac{\sigma_{psq}}{\sigma_{rsq}} \right) \cdot 100$$

$$\text{percentexplained} = 5.235$$

So we have potential moderators

Appendix A: Sample Calculations (Continued)

Using the t-approximation assuming unequal variances

$$t_{\text{approximation}} := \frac{r_{\text{barcorrected1}} - r_{\text{barcorrected2}}}{\sqrt{\left(\frac{SD(r1)^2}{n1}\right) + \left(\frac{SD(r2)^2}{n2}\right)}} \quad t_{\text{approximation}} = 1.099$$

$$c := \frac{\frac{SD(r1)^2}{n1}}{\left(\frac{SD(r1)^2}{n1}\right) + \left(\frac{SD(r2)^2}{n2}\right)}$$

$$df := \frac{(n1 - 1) \cdot (n2 - 1)}{\left[(n2 - 1) \cdot c^2 + (1 - c)^2 \cdot (n1 - 1)\right]}$$

$c = 0.394$

$df = 4.779$

(From Table 4 p. 637, Hildebrand & Ott, 1996)

Using 5 df and 0.025 two-tail then $t = 2.571$.

If $t - \text{observed} > t - \text{table}$, then reject null

1.01 is not > 2.571 so DO NOT REJECT @ alpha = 0.05.

Using 5 df and 0.005 two-tail then $t = 4.032$.

If $t - \text{observed} > t - \text{table}$, then reject null

1.01 is not > 4.032 so DO NOT REJECT @ alpha = 0.01.

ORGANIZATIONAL SIZE IS NOT A MODERATOR OF P & JS

Appendix B: Results – Corrected/Weighted Correlation & Confidence Intervals

| Strategy/Study | N | Outcomes | Corrected Correlation | Confidence Interval |
|--|------|---------------------------|-----------------------|---------------------|
| Participation | | | | |
| Job Satisfaction (JS) | | | | |
| Judge, Thorenson, Pucik & Welbourne (1999) | 514 | P (66) & JS = 43 (78) | 599 | |
| Lyu & Roffey (1983) | 195 | P (63) & JS = 36 (60) | 586 | |
| Nelson, Cooper, & Jackson (1995) | 397 | P (73) & JS = -66 (93) | 801 | |
| Oliver (2000) | 120 | P (71) & JS = 29 (n/a) | 371 | |
| Parker, Chmiel & Wall (1997) | 139 | P (77) & JS@ T1 = 63 (87) | 77 | |
| | 139 | P (81) & JS@ T2 = 60 (91) | 699 | |
| Saige & Koslowsky (1996) | 232 | P (88) & JS = 29 (84) | 337 | |
| Wanberg & Banas (2000) | 130 | P (72) & JS = 07 (88) | 088 | |
| Witt (1992) | 1083 | P (90) & JS = 37 (79) | 439 | |
| Zeffane (1994) | 1300 | P (83) & JS = 27 (79) | 333 | |
| N Total | 4249 | | Weighted Mean = 469 | (327 – 609)* |
| Org Commitment (OC) | | | | |
| Allen & Meyer (1990) | 120 | P (61) & OC = 23 (67) | 36 | |
| Coyle-Shapiro & Jacqueline (1999) | 118 | P (84) & OC@ T1 = 08 (78) | 099 | |
| | 118 | P (84) & OC@ T2 = 22 (78) | 272 | |
| | 118 | P (84) & OC@ T3 = 37 (78) | 457 | |
| Huang & Kappelman (1996) | 146 | P (93) & OC = 07 (85) | 079 | |
| Hui & Lee (2000) | 378 | P (88) & OC = 53 (87) | 606 | |
| Judge, Thorenson, Pucik & Welbourne (1999) | 514 | P (66) & OC = 64 (79) | 886 | |
| Latham, Winters & Locke (1994) | 53 | P (85) & OC = 21 (90) | 24 | |
| Lau & Woodman (1995) | 346 | P (69) & OC = 23 (86) | 298 | |
| Oliver (2000) | 120 | P (71) & OC = 72 (80) | 455 | |
| Saige & Koslowsky (1996) | 232 | P (88) & OC = 28 (69) | 359 | |
| N Total | 2263 | | Weighted Mean = 509 | (338 – 680)* |
| Change Adoption (CA) | | | | |
| Eby, Adams, Russell & Gabby (2000) | 117 | P (74) & CA = 28 (80) | 364 | |
| Huang & Kappelman (1996) | 146 | P (93) & CA = 14 (92) | 151 | |
| Hui & Lee (2000) | 378 | P (88) & CA = -26 (80) | -31 | |
| Saige & Koslowsky (1996) | 232 | P (88) & CA = 28 (87) | 32 | |
| Wanberg & Banas (2000) | 130 | P (72) & CA = 26 (85) | 336 | |
| N Total | 1003 | | Weighted Mean = 065 | (-182 – 312) |
| Performance (P) | | | | |
| Bartunek, Greenberg & Davidson (1999) | 262 | P (n/a) & Pe = 23 (96) | 247 | |
| Latham, Winters & Locke (1994) | 53 | P (85) & Pe = 47 (94) | 526 | |
| Tannenbaum & Dupree-Bruno (1994) | 840 | P (94) & Pe = 27 (67) | 34 | |
| N Total | 1155 | | Weighted Mean = 328 | (167 – 488)* |
| Turnover (T) | | | | |
| Oliver (2000) | 120 | P (71) & T = -20 (n/a) | 237 | |
| Wanberg & Banas (2000) | 130 | P (72) & T = -12 (n/a) | 141 | |
| N Total | 250 | | Weighted Mean = 187 | (093 – 282)* |

Appendix B: (Continued)

| Strategy/Study | N | Outcomes | Corrected Correlation | Confidence Interval |
|----------------------------------|-----|------------------------------|-----------------------|---------------------|
| Participation (Continued) | | | | |
| Miscellaneous | | | | |
| Collins, Hatcher, & Ross (1993) | 485 | Implement = 20 (n/a) | | |
| Hui & Lee (2000) | 378 | Absenteeism = -11 (n/a) | | |
| Nelson, Cooper, & Jackson (1995) | 397 | Intrinsic Motivate = 17 (63) | | |
| | | Mental Health = 34 (63) | | |
| | | Phys Health = 25 (84) | | |
| Tannenbaum & Dupree-Bruno (1994) | 840 | Innovation = 18 (56) | | |
| Wanberg & Banas (2000) | 130 | Intent to Quit = -03 (88) | | |
| Communication | | | | |
| Job Satisfaction (JS) | | | | |
| Lyu & Roffey (1983) | 195 | C (66) & JS = 67 (60) | 1.00 | |
| Nelson, Cooper & Jackson (1995) | 397 | C (83) & JS = -52 (93) | 592 | |
| Schweiger & Densi (1991) | 147 | C (94) & JS = 23 (98) | 24 | |
| Wanberg & Banas (2000) | 130 | C (87) & JS = 05 (88) | 057 | |
| N Total | 869 | | Weighted Mean = 558 | (123 – 994)* |
| Org Commitment (OC) | | | | |
| Daley (1995) | 183 | C (77) & OC = 53 (88) | 644 | |
| Gopinath & Becker (2000) | 144 | C (81) & OC = 37 (90) | 433 | |
| Schweiger & Densi (1991) | 147 | C (94) & OC = 31 (88) | 341 | |
| N Total | 474 | | Weighted Mean = 486 | (31 – 662)* |
| Change Adoption (CA) | | | | |
| Johnson & Meyer (1999) | 79 | C (89) & CA = 52 (86) | 594 | |
| Wanberg & Banas (2000) | 130 | C (87) & CA = 24 (85) | 279 | |
| N Total | 209 | | Weighted Mean = 398 | (087 – 709)* |
| Intent to Remain (I R) | | | | |
| Daley & Geyer (1994) | 171 | C (74) & IR = 18 (83) | 23 | |
| Schweiger & Densi (1991) | 147 | C (94) & IR = 36 (91) | 389 | |
| Wanberg & Banas (2000) | 130 | C (87) & IQuit = -14 (88) | 16 | |
| N Total | 448 | | Weighted Mean = 262 | (128 – 395)* |
| Miscellaneous | | | | |
| Johnson & Meyer (1999) | 79 | Innovativeness = 59 (86) | | |
| Nelson, Cooper & Jackson (1995) | 397 | Mental Health = 44 (63) | | |
| | | Phys Health = 34 (84) | | |
| Schweiger & Densi (1991) | 147 | Org Perception = 29 (90) | | |
| | | Performance = 07 (n/a) | | |
| Wanberg & Banas (2000) | 130 | Turnover = -02 (n/a) | | |
| HRM Practices | | | | |
| Miscellaneous | | | | |
| Huang & Kappelman (1996) | 146 | Org Commitment = 00 (85) | | |
| | | Change Adoption = 07 (92) | | |

Note: Decimals have been omitted for clarity. Reliabilities are reported under “Outcomes” in parentheses. Correlations under the outcomes titled “Miscellaneous” are not calculated since a minimum of two correlations under the same strategy and outcome combination are required.

*Denotes Significant at 0.05 level.

Appendix C: Solicitation Letter Sent Requesting Change Related Studies

ATTENTION: ORGANIZATIONAL CHANGE STUDIES REQUESTED!!!

I need your help! I'm a graduate student at the Air Force Institute of Technology (AFIT) working on my Master's Thesis involving a meta-analysis of selected studies in the area of organizational change. More specifically this study is designed to explore the relationship between certain change facilitation strategies (e.g., communication, participation, organizational, individual) and relevant outcomes (e.g., productivity, job satisfaction, turnover). Thus, I am trying to collect studies published and unpublished from 1990 or later that have reported sample sizes, indicated effectiveness or level of adoption at an individual level, and reports quantitative data.

If you are aware of any studies that you think might be appropriate, I would appreciate it if you forward a citation or a copy of the study to me. Studies can be mailed or e-mailed to the address below.

Capt Jay Welborn
AFIT/ENV
Building 640
2950 P. Street
Wright-Patterson AFB, OH 45433-7765

Or forward electronic copies to:

Jay.Welborn@afit.af.mil and/or Daniel.Holt@afit.af.mil

I want to thank you in advance for your interest and participation in this research and for taking time out of your busy schedules to help me in this endeavor. I would appreciate it if all information were complete so that I may properly reference you in the study and a contact phone number or email address for any clarifications or questions I may have about your research.

If you have any questions, comments, or criticisms regarding this study, I would like to hear from you. The easiest way to get in touch with me is via e-mail at the address above. Also, feel free to pass on your name, mailing address, and e-mail address if you are interested in receiving a copy of my results. I hope to be completed with this work in March 2001. Thanks again!

Sincerely,

(Signed)

JAY A. WELBORN, Captain, USAF
Masters Student, Engineering and Environmental
Management

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*Indicates citations that were included in the meta-analysis study.

Vita

Captain Jay A. Welborn was born on [REDACTED] in Connersville, Indiana. He graduated from Union County High School in Liberty, Indiana in May 1984. He entered undergraduate studies at Indiana University East in Richmond, Indiana where he studied Mechanical Engineering for one year. On 28 June 1985 he first entered the active duty Air Force and was assigned to the 354th Civil Engineer Squadron at Myrtle Beach AFB, South Carolina. While stationed at Myrtle Beach AFB, he served as an Engineering Assistant Specialist until the end of March 1989 when he left the service to work for a local architectural firm.

In January 1990, he moved to Knoxville, Tennessee to attend the University of Tennessee's 5-year Architecture program. While at the University of Tennessee, he won several design awards to include a \$1,500 Pella Traveling Scholarship in a design competition among third-year students. He graduated Magna Cum Laude with a Bachelor of Science degree in Architecture in May 1995 shortly after being notified of his acceptance to Officer Training School at Maxwell AFB, Alabama. He entered the active duty Air Force for the second time and received his commission on 22 November 1995.

His assignment upon commissioning was Sheppard AFB, Texas assigned to the 82nd Civil Engineer Squadron as a design architect. In May 1998 he arrived at Kirtland AFB after being hand selected by the 377th Civil Engineer Group commander to lead the A-76 Civil Engineer outsourcing effort. In August 1999, he entered the Graduate School of Engineering Management, Air Force Institute of Technology. Upon graduation he will be sent temporary duty to Squadron Officer School at Maxwell AFB, Alabama enroute to Misawa AFB, Japan for a 3-year overseas tour.

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| 13. SUPPLEMENTARY NOTES | | | | | |
| 14. ABSTRACT This research represents a meta-analysis of 24 empirical studies that explored and identified which organizational factors moderated the relationships between facilitation strategies and change adoption. The results indicate two key facilitation strategies, participation and communication, that produced significant results. Participation resulted in a positive impact on job satisfaction, organizational commitment, performance, and turnover rates, while communication resulted in a positive impact on job satisfaction, organizational commitment, change adoption, and intent to remain. Contrary to many research studies, participation strategy was a non-significant moderator for change adoption. The identified strategies and outcomes were then analyzed for potential moderators. Due to the lack of correlation data, only 10 of 40 potential moderators were analyzed. Four of the 10 moderators only had two correlations, which was the minimum number required for analysis. As a result, all 10 moderators analyzed resulted in a non-significant impact on the outcomes, making the moderator analysis questionable. | | | | | |
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