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ABSTRACT

DEVELOPMENT OF A PARTICIPATIVE APPROACH TO GUIDE ORGANIZATIONAL CHANGE: REVIEWING THE SAWTOOTH TECHNIQUE

MARTIN, PORT R., Ed.D., University of San Diego, 1995, 216 pp.

Director: Edward Kujawa, Ph.D.

In a world economy that bears scant resemblance to the one dominated by the United States following World War II, many American companies have found it increasingly difficult to keep pace with their foreign competitors. The public sector, too, has found itself under significant pressure to provide needed services but with significantly reduced resources. In each individual case leaders have been seeking new solutions to both old and new problems, and organizations have been faced with change and its impacts.

The purpose of this study was to design a methodology that could be used to structure organizational changes in such a way that negative aspects could be minimized and improvements would begin to show positive results in a relatively short time. Using a change strategy that was designed by the United States Navy to address specific problems in personnel retention, a procedure was developed that could address more general issues, use modern computer technology to speed the process, and more fully involve the people of an organization undergoing change. Once constructed, the methodology was tested with two private sector organizations in order to gain initial insights as to strengths and weaknesses.

The final results of the practical tests showed a methodology of considerable promise as a

consultant strategy. The importance of leadership to the change process was evident as was the need to fully involve the people of an organization in order to maximize change effectiveness and minimize resistance to change.

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To Diane
for her quiet encouragement

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As I review the influences that have led me to this point in time, I find it very difficult to mention all those who have had some significant part without thanking the population of the planet earth. However, I shall try to distill from that multitude those who have most contributed to this particular research effort.

To my committee I owe first thanks as they have been forced to tolerate the first (and sometimes unpolished) scriblings of the mad scientist as he proceeded on his way.

To Ed Kujawa I owe a special tribute for it was he, as my dissertation director, who led me through the maze of hurdles that surround a doctoral research project. To Johanna Hunsaker, who increased my understanding of organizations and myself immensely, and John Ronchetto, who challenged me to begin this entire course of leadership studies, I owe considerable thanks for new insights and subject matter guidance.

I am most grateful to the leaders and other members of the two private sector organizations who agreed to participate in this research. Without their practical setting for testing the basic structure of the Sawtooth Technique, I would not have felt nearly as confident that this new methodology holds great practical promise for changing organizations. To Roger Thompson, Nate Mondy and the other developers of the U.S. Navy change strategy that provided such a strong basis for the more generalized technique I have described here, I owe special thanks. Without them this dissertation research would not have been attempted.

Behind these most crucial participants in the immediate research environment lie a host of others who have given me the tools to challenge these new horizons. Of these, my parents must receive credit for having started me on my way and guiding me wisely through the most

formative years of my life. With them Ms. Marilyn Sparks of the Whitman College Library has been a constant source of encouragement to improve myself educationally and to write. My thanks also go to Mr. Harmon Johnson who encouraged me during my Little League days when I learned the value of teams and teamwork.

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CHAPTER I
THE IMPACT OF CHANGE

In a world economy that bears scant resemblance to the one dominated by the United States following World War II, many American companies have found it increasingly difficult to keep pace with their foreign competitors. Facing a taxpayer demand for higher quality services with reduced available revenues to pay for those improvements, government officials have pushed for major organizational restructuring. Increasing competition among non-profit organizations has pushed industry leaders to find more efficient ways to serve their constituencies. Although the leaders of each of these organizations have faced a different set of problems in different environments, they all have been forced to facilitate change and its impact upon their various entities.

Not only have the quantity and significance of change been growing, but the very pace of change has been accelerating. Toffler (1970) stated, "The acceleration of change in our time is, itself, an elemental force. This accelerative thrust has personal and psychological, as well as sociological, consequences (p. 4)." A decade later Toffler (1980) expanded his earlier work to provide more specific aspects of the revolutionary changes he saw occurring. Still later he went on to define a new theory of social power based on the changed role of knowledge (and technology) in global and national affairs (Toffler, 1990).

Traditional organizational changes have been classified as having been initiated either from the top down or from the bottom up (Kotter & Heskett, 1992). The size of the organization as well as the pervasiveness and depth of change experienced have helped to

define the dimensions of the changes (Mohrman, Mohrman, Ledford, Cummings & Lawler, 1989). Consultants, prophets of quality and authors from many academic backgrounds have been flooding the American society with ideas for changing the present into something significantly better (Ciampa, 1992; Hunt, 1992; Kanter, Stein & Jick, 1992; Kotter & Heskett, 1992; Morris, 1995; Peters, 1992; Senge, 1990).

Yet, in spite of a growing national interest in changing both the character and culture of organizations, not a single, well-accepted strategy to introduce large-scale change has been clearly identified. Practitioner literature has been filled with cases that represent both successful and unsuccessful organizational change efforts. Academicians have continued to develop ideas that have appeared and reappeared throughout the twentieth century, ranging from such pioneer developers of management theories as Frederick Taylor and Mary Parker Follett to more modern theorists such as Douglas McGregor, Peter Drucker, and Rosebeth Moss Kanter. Edwards Deming (1986), Joseph Juran (1979), Philip Crosby (1979) and many others have concentrated their directions for improvement around what needs to be done along with the skills and tools needed to accomplish it. What has largely been neglected is the development of practical strategies for making the changes. It is this lack of a sound implementation methodology that may explain the widely varying (and often unsuccessful) attempts to modify organizations.

Two groups of individuals, leaders of organizations and consultant change agents, would seem to benefit most from the identification of a methodology that would consistently produce superior results when applied to or within changing entities. However, neither may be motivated to accurately describe such a procedure if it should exist. The leader is most concerned with the changes within one organization at one time within one environment.

If successful on a grand scale, that individual may well be able to choose another such organization in a similar situation within which to repeat the desired changes. This approach would tend to support a strategy designed to produce success in a very specific industry or niche in society as a whole. Since leaders tend to affect only a few major organizations in their working lives, even the most successful will only guide major changes two or three times in their careers. The short term, bottom-line specific expectations of those same leaders will also force them to choose immediate success over long-term, continuing programs because without success in a crisis the organization may not survive to benefit.

To produce a management consulting product, consultants must also face limitations in time to demonstrate success as well as the need to have a well-defined, understandable product. This may guide a consultant to provide a simple-to-understand service that demonstrates immediate value to the client while ignoring the depth of impact of proposed changes. As long as the client organization has a number of clearly obvious problems for which effective potential solutions are available, the consultant may choose problem solving rather than long-term organizational change as a service.

Even academicians, who might be expected to rise above these practical, marketplace demands, face difficult challenges in separating change fact from fiction. Without the consistent successes of some techniques in practice upon which to base studies, it is difficult to sort out winning general strategies from the environmentally specific ones. Considering the long time frames needed to assess real, lasting successful changes (and the difficulty in specifying the measures by which to evaluate those successes), the study of such change processes becomes very complicated (Mohrman et al, 1989). It is much easier to focus on a single tool of change agents or upon a very limited number of specific case studies. Thus,

time and practical factors tend to limit academicians and practitioners alike.

Statement of the Issue

With the dissolution of the Union of Soviet Socialist Republics and the seeming return to a peacetime status for the first time in half a century, the American populace has refocused its attention from the survival of a nuclear confrontation to an examination of its own institutions. Poor service from government bureaucratic agencies, once tolerated as a necessary evil, is no longer acceptable. Shareholders of corporations, tired of old ideas that do not appear to address aggressively the fierce competition from abroad, are demanding that staffs be streamlined, operations fine tuned to raise quality and more ethical practices implemented.

While the streets are now safe from the threats of a major hostile power, they are threatened by our own children armed with assault weapons and criminals who will neither remain in prison nor rehabilitate. Our educational system, once considered a model for the entire world, finds itself facing heavy criticism for producing graduates who are ill-prepared to participate in the existing economic world.

Yet in the face of these and other challenges somewhat unique to this period in human history, our leaders seem paralyzed and unable to develop the critical solutions. Politicians pass laws and budgets that they say fix everything. The police and courts catch the criminals and send them off to prison; then they ask for more money for more courthouses and more jails. More money is allocated to the schools, but the money doesn't seem to have the desired effects in the classrooms. Medical costs rise more rapidly than wages and inflation, and the southern border is crossed daily by thousands of illegal immigrants. The old solutions don't seem to work, and the new solutions seem to meet with consistent opposition.

The call is clearly for change. But what change? And how will it be accomplished? If our legislators cannot find the answers and our executive leaders are puzzled by what they see in angry constituents, how will we restructure our institutions and organizations so that they more clearly serve the general population? The answer, it seems, lies not only in what we do but how we do it. Resistance to change, long identified by change theorists as a potent force with which to be dealt (Bennis, 1966; Conner, 1993; Kanter, Stein & Jick, 1992; Mahoney, 1991; Oakley & Krug, 1993; Wieland & Ullrich, 1976; Wille & Hodgson, 1991), must be more actively addressed. But when? And how?

The answer may lie cleverly disguised in our twentieth century fascination with technology and its accompanying scientific paradigm. It may also be concealed in our desire to study so many topics by partitioning them into strict disciplines within which experts devise unique vocabularies to distinguish the dominance of their thinking over that of other competing disciplines. At the place where the leaders, managers, psychologists, sociologists, politicians and human behaviorists all sit down together, there could well reside a very effective structure to guide the development of solutions for the problems of this and the next century.

Few students of our current economic world would argue against the idea that we are entering a very different type environment. Drucker (1991, 1993), Naisbitt (1994), Toffler (1970, 1980, 1990) and Peters (1992) all raise the issue of knowledge-based societies where information technology and workers who possess the means of production within their minds have replaced the more traditional assembly lines and factories. No longer is it simple to replace even one departed employee with an equal, nor can the leader simply impose changes upon an organization with the assurance of a predictable result. People, then, have largely

replaced the classic mechanical means of production of the industrial age that have dominated the economic world for the past two hundred years. Because of that fact alone, they must naturally play a larger part in the affairs of any organization and, particularly, one in transition.

The economic challenge posed to the United States by Japan (and to a lesser degree by the European nations) has sparked an American revolution in quality, but that revolution has often been attempted within our organizations without the active participation of the human element that is becoming increasingly more important. In spite of criticisms by Edwards Deming (1986) and others that most of our organizational problems are the result of poor management, we have not invested heavily in changing that very aspect of our companies and government agencies. We have, instead, continued to look for the instant solution that reflects only the solution of the omniscient manager or small core of senior staff members. Calls for greater participation through empowerment have largely been ignored or specifically avoided because of the poor performance of quality circle efforts earlier in this half century. Our schools have continued to teach the primacy of the individual just as our legal system has verified the same.

Taught to be individualists, we have been continually rewarded as such and sent very strong, though often subtle, messages that teams are all right but the individual is king. Even where managers and leaders have attempted to be more participative in their activities, they have often not known how to more actively involve their subordinates and peers in developing solutions that could be owned by the entire organization.

Purpose and Objective

The purpose of this research was to document a practical methodology which could be

used as a guide for initiating large-scale organizational change. The described methodology was practically illustrated in a field study involving two firms, one large (about 100 employees) and one small (about 10 employees), as they employed the strategy to initiate significant changes in their organizations. Specific steps were outlined that would provide a means for developing wide-spread participation in change efforts while helping to minimize the natural resistance to change that could be expected to arise during any period of significant changes. The strategy described would be appropriate for implementing the philosophies of Dr. Edwards Deming, Joseph Juran and Philip Crosby as well as for accomplishing a variety of other important organizational modifications.

In addition to the field study (that should provide a practical illustration of the methodology) the history of that strategy is presented in the form of an abbreviated case study. The individuals involved, their backgrounds and the iterative development of the change technique is discussed.

One of the most commonly used strategies for significantly changing an organization's culture has relied to a great extent upon senior executive leadership, employee awareness training and a rigid application of consultant-supplied structures. Change programs have usually called for a "top down" approach that leaned heavily upon organizational development (OD) techniques developed in the early 1960s. New philosophies and procedures were publicized, employees were trained and encouraged to adopt the new methods of working, and the organization, theoretically, improved.

Yet, students of the change process in a given organization often have found it difficult, if not impossible, to ascertain exactly which changes, if any, had actually occurred. The need to wait for long periods of time to assess progress was often very costly had a poor course

of action been established at the outset. It could also have been difficult to ascertain whether the optimum changes had been selected for implementation. As noted by Senge (1990), the selection of the wrong problem to solve or, in other words, the treatment of symptoms rather than the root cause of the symptoms could lead to a worsening situation instead of an improved organization.

Most (if not all) planning has traditionally taken place in isolation from the operating personnel involved in organizational processes and, therefore, represented only the thinking of senior managers. Most members of the organization initially have seen desired changes as those changes began to impact them personally. Overcoming the resistance presented by these key members of the organization often has consumed a disproportionate amount of the effort and resources needed to modify the organization character and, ultimately, culture. In a world of ever-accelerating changes where product lives have often been only eighteen months and events in China have demanded changes in Georgia, resistance of any significance could delay needed responses and threaten the very survival of a firm or agency. Many of the strengths provided by the people most affected by the changes (as represented in their knowledge) have often been neglected.

The specific objectives of this study were:

1. To describe a participative methodology for initiating change in organizations that both took advantage of a collaborative implementation strategy and significantly reduced the natural human resistance to change.
2. To provide the theoretical basis for this methodology as it has appeared in previously documented research and related literature. (Since the technique to be described was developed in an iterative, trial-and-error manner by individuals whose focus was practical

and not academic, the link with established research was not equivalent to a simple review of related literature. Instead, it verified and provided practical meaning to the work in a variety of disciplines by numerous authors and researchers.)

3. To demonstrate the potential for this methodology by using it to guide two organizations, one large and one small, during their initial organizational change efforts.

The major research questions of the study are as follow:

1. How would a practical change implementation strategy be structured to make maximum use of organizational strengths while simultaneously reducing resistance to change? This question demands that some logical sequence of events be specified to guide the leader in establishing new directions for an organization as well as defining some of the skills required of the leader who seeks to accomplish such a transformation.

2. How would this strategy differ from or utilize aspects of other commonly used change and management schemes? Would this scheme make use of various existing schools of management thinking (that include organizational development, management by objectives, and situational leadership among others), each of which attempts to guide change efforts within a framework constructed by a particular managerial emphasis, or is a new framework more appropriate?

3. How would such varied disciplines as psychology, sociology, and politics contribute to this methodology? This is a question of integration and drives a systems point of view in regard to the application of organizational, managerial and human behavioral research to the changing of human social structures.

Definition of Terms

The following key terms will be used throughout the course of this research:

1. **Organizational change** as it relates to this study indicates a **significant, lasting modification** in the manner in which an organization operates, which is further reflected by an alteration in its performance (Ciampa, 1992; Mohrman et al, 1989). Morris (1995) has pointed out that the word change, meaning "to exchange or barter" in its Latin origins, has evolved to a present meaning that describes "a general process of exchanging one entire state of affairs for another, life becoming somehow different than it was before (p. 51)." Change as used here will be considered to have fundamental, frame-breaking implications as distinguished from incremental change, which tends to be slow, evolutionary and progressive (Beckhard & Pritchard, 1992; London, 1988).

2. **Organizational culture** derives its meaning from social anthropology where the term culture was coined to represent the broad body of qualities held by any specific human group that passed on from one generation to another (Tylor, 1887). The American Heritage Dictionary (1982) formally defines the term **culture** to mean "the totality of socially transmitted behavior patterns, arts, beliefs, institutions, and all other products of human work and thought characteristic of a community or population (p. 348)." Kotter and Heskett (1992) further define organizational culture as being composed of two levels: one level that is readily visible to those within or associated with an organization and a deeper, less visible level that refers to the values shared by the members of the organization, values that tend to persist even as group membership changes. For the purposes of this research, the American Heritage definition of culture as it would be associated with an organizational entity and as enhanced by the Kotter and Heskett insight serves as the appropriate meaning of the term "culture."

3. **Organizational character**, building on an American Heritage Dictionary (1982)

definition of character, is the combination of qualities or features that distinguishes one organization from another. It most closely resembles the more visible organizational characteristics noted by Kotter and Heskett (1992) and would be reflected most commonly in the manner in which an organization acts or appears to an observer. It should be distinguished from culture in that it is of less depth and does not, generally speaking, include the entrenched values of the organization (Ciampa, 1992).

4. **Organization development** (OD), as noted by Margulies and Raia (1972), is "a systems approach to the total set of functional and interpersonal role relationships in organizations (p. 2)." They consider OD itself to be composed of three related aspects-- values, process and technology. The values relate to human nature as it relates to the organization and its work. The basic process of OD consists of data gathering, organizational diagnosis and action interventions as described by Lewin (1951) and expanded upon by Lippitt, Watson and Westerly (1958). OD technology is a collection of techniques and methods, many emerging from strong behavioral science origins, aimed at developing improved organizational learning and new ways of addressing organizational issues. Ciampa (1992) has further noted that the principles guiding OD are identical to those underlying the quality concepts voiced by Deming (1986), Juran (1979, 1988) and many others.

5. **The Sawtooth Technique** is the name chosen to represent the organization change methodology being examined in this study. It is so named because of the back-and-forth (sawtooth) manner in which initiatives shift between a guiding change agent (or consultant) and the organization (and its people) undergoing change. (Chapter Four provides a detailed discussion of the technique and illustrations of its application in two private sector firms.)

Significance of the Study

The absence of clear guidelines to assist leaders in more effectively changing their organizations handicaps our entire society as it attempts to address the challenges outlined previously. Faced with the "management theory of the week," leaders, even those with considerable experience, often develop considerable skepticism as to the value of the body of leadership and management knowledge. Each change effort seems to be an entirely unique experience with success a rather random and unpredictable occurrence. Although some leaders seem to consistently achieve more success in this area than others, the accomplishment of desired organizational change has appeared to remain an art in a world demanding that it be a science.

By integrating the strengths of many disciplines into a practical methodology for everyday use, the description of the technique discussed in this study can focus the strengths of many complementary aspects into a more manageable and yet more powerful approach. The value to the beginning leader and manager is obvious, but the conflicting experiences of the more senior leader can most likely be made more understandable also. The results should also help to identify theoretical areas where additional research might further strengthen the methodological design.

Following World War II the United States found itself as the only free market economy with its industrial base fully intact. In the subsequent three decades, facing very limited competition from abroad, the successes of that economic machine became associated with the management styles of the individuals who led the organizations participating. When enhanced competition began to challenge seriously the entire nation's products, it became obvious to some that the credits of the earlier years were, perhaps, not well earned.

Developing skills and techniques more supported by the body of human and organizational research is a step in replacing myth with fact and magic with science.

At a time when the United States is actively evaluating the need for changes that range from modifications in the government infrastructure to the redesign of the workplace to the delivery of education within school systems, the development of a flexible, practical change strategy to guide many different change implementations could be of long-term economic and social value to both public and private sectors, to both profit and non-profit organizations.

Limitations

The basic structure of the methodology described was first conceived by a group of military personnel who were addressing the specific problem of retaining more personnel on active duty in a time of generally declining reenlistments. The framework outlined here has been generalized to provide it with a structure that is fully adaptable to a variety of different environments. In some areas the changes are fairly substantial and will require future study to ensure that the modifications have been most appropriately made.

Because of the time frames that must be used to evaluate the success or failure of specific change efforts, the results reported here cannot serve as a sound basis for full evaluation of the technique. It must be left for future researchers to evaluate this technique as practiced by a significant number of organizations in a number of different environments. The two organizations using this technique and described by this study should be used as examples as to the manner in which the methodology can be employed rather than serving as examples of the success or failure of the technique.

The two companies were selected specifically because the two top leaders were open to

new concepts and faced significant changes in the near future. One possessed a doctoral degree in political science and the other was in the final stages of a leadership doctoral program. Because they do not represent the norm of leaders frequently found in such organizational roles, they also provide an unnatural aspect to the implementation study. On the other hand, they were able to provide unusual insight into the values and shortcomings of the technique.

Researcher biases must also be considered to be a significant limitation of this study. Although other practitioners developed important aspects of the methodology to be examined and described herein, working for over twenty years in organizational change roles has undoubtedly created strong directions for my thinking. The final form of the methodology to be examined in practice was structured by me, and several of the interim development steps were not evaluated by others. Thus, although the Sawtooth Technique is the creation of a variety of individuals and practical applications, its final form bears a strong imprint from this researcher.

Dissertation Organization

Chapter Two is a review of the literature that places special emphasis on change and changing organizations. A brief review of management theory development during the twentieth century as well as the other writings that discuss the practice of those theories is included to demonstrate the general patterns that have provided the basis for the managerial environment of today. A major emphasis is placed upon issues related to organization development because of its strong human behavioral roots and because of its influence upon the developers of the change technique described by this study.

Chapter Three sets forth the research design and methodology which were used to

complete the study. This includes a description of the research environment, reasons for adapting the original change structure to a modified format, preliminary survey question data base development, and use of a participatory action research approach to the field implementations.

Chapter Four is a description of the organizational change technique itself and the two practice implementations used to refine the steps. As the methodology is described, the existing research that is relevant to the specific steps is discussed. This combination of theory with the practical steps supported thereby is presented to provide greater depth of understanding to the prospective practitioner as well as to show the academic basis for the technique.

Chapter Five presents final conclusions as to the potential uses of the change methodology to include the skills and the environment most important to its successful use. The implications for future research conclude the discussion.

CHAPTER II

REVIEW OF THE LITERATURE

After a surge of interest in changing organizations that began in the late 1940s with the work of Lewin (1951) and lasted until the mid-1970s, researchers studying the phenomenon of organizational change were relatively few until the recognition of a changed global marketplace began to create a sense of crisis in the American business community. The focus of recent studies has seemed to either reside at the individual and small group level (teams, particularly cross-functional teams, as an example) or at the overall organizational (corporate) level. Little integration of the two viewpoints has been in evidence. How, for instance, would strategic planning, effective teams and participative management interact with each other to improve organizational performance?

Ciampa (1992) has pointed out that with the increased interest in the quality improvement programs that began to develop in the late 1970s came a matching interest in the best methods to modify organizations to incorporate significant changes in their underlying cultures. He went on to note that seeing the loss of market share to foreign companies (dominated by those in the Far East), U.S. companies began many visits to Japan to ascertain the nature of their most successful competitors. What those American visitors discovered were very familiar tools and techniques as most of them had been imported from the United States. What they also found, however, was that those same tools and techniques were being used in a different manner, one that emphasized uniform company dedication to continuously improving quality as seen by the customer. Further, this attitude permeated the entire

organization and was not restricted to senior managers and leaders. Coordination between functional entities and an increased influence of those closest to the customer were other key attributes noted.

This broadening of viewpoint has led to a significant number of authors bringing forth theories of change or at least restating their work of the past few decades (Beckhard & Harris, 1987; Bennis, 1993; Schein, 1987). This recent increase in the absolute quantity of "change" literature after an hiatus of over a decade has, perhaps, brought on a sense of confusion rather than one of integration when viewed by the management practitioner.

This review will begin with a general look at change and its implications for organizations. With the concept of change in mind, the review will rapidly view key management theorists, starting with Frederick Taylor at the beginning of this century.

Important aspects of bodies of knowledge which provide complementary theories and research information will be discussed, to include a special emphasis on organization development, which serves as a particularly important source of techniques for the change methodology to be described. Additional observations will focus upon the last decade with its special emphasis upon the American quality improvement efforts as a practical laboratory for evaluating several of the various theorists and disciplines. A final look at integration with a view on the development of the change implementation technique will conclude the review.

The Framework of Change

Change indicates that something will be different than it is now or was yesterday. One state or condition will be abandoned for another. This research is specifically directed toward large-scale organizational change, the definition of which can be summarized as a significant, lasting modification in the manner in which an organization operates, which is

further mirrored by an alteration in its performance (Ciampa, 1992; Mohrman et al, 1989).

Ciampa (1992) has noted that when change occurs, both the organization's character and culture may be affected, the difference between those aspects basically residing in the depth of the change. He felt that in spite of much open discussion among both academicians and practitioners, there was significant confusion between that which an individual leader or group of managers could effectively change (character) and that which remained more a function of the collective action of the entire organizational population (culture). This difference would then be reflected in the greater permanency and depth of culture when compared to character.

It should also be noted that issues regarding change as herein discussed are focused upon people, the human element, as opposed to the technical aspects of processes, machinery and the like. This is a key aspect that must be constantly revisited as one considers change since the human being when characterized in a large social group (sociological view) may behave quite differently than any one or a few individuals (psychological view). This creates significant challenges for the organizational leader, because each organization will present a different combination of individuals as well as groups to consider. (This can be contrasted with the modification of a machine, which can be expected to perform in a consistent, although new, manner when modified or changed.)

Ciampa has also postured that changes would most likely first reflect a change of character, and, then, after some period (perhaps years) of acceptance, become a permanent part of the organization's culture. The changes attributed to organizational leaders of relatively short duration (nominally three to five years) would usually reflect a new organizational character although the leaders themselves would like to think that beneficial

changes would be permanent. Those aspects which seem to survive changes in individual leadership, environment, organizational structures and the like would become part of the organizational culture.

Bennis (1966) noted that there was a significant difference between theories of **change** and those of **changing**. At the time he was writing he lamented that there were many writers working to document and explain organizational systems but without attempting to identify the best means for successful alterations. In his words, these were theories "suitable for observers of social change, not theories for participants in, or practitioners of, social change (p. 99)." As late as 1986 Porras and Hoffer, speaking about organization development, commented that "both research and practice in the field suffer from the lack of a unifying theory of planned change (p. 477)." They further noted the extreme complexity of organizations and numerous factors and relationships involved. In spite of the warnings of some widely read futurists (Naisbitt, 1982, 1994; Toffler, 1970; Toffler and Toffler, 1993) and business writers (Crosby, 1979; Deming, 1986; Drucker, 1991; Peters, 1987; Peters & Austin, 1985) change and our ability to guide and achieve it have tended to remain in the descriptive rather than practice regime when documented. Although this academic shortfall has not seemed to lessen the number of management consultants seeking to assist organizations in improving their performance, it has probably reduced change effectiveness and kept potential customers wondering what they were buying. Peters (1992) simply concluded that even simple changes were "hopelessly complex (p. 628)."

The issue of organizational change and development began to emerge as an important one following World War II with the advent of government-sponsored programs to assist American military personnel in their transitions back to civilian life (Ciampa, 1992). From

these beginnings and over the next several decades would emerge the techniques associated with organizational development. Surprisingly, few authors until very recently have chosen to address the issues of large-scale organizational change (Lundberg, 1984; Mohrman et al, 1991). The literature has also largely been silent as to the task of developing a theoretical understanding of the issues of change, its dynamics and implementation (Porras & Robertson, 1987).

Conner (1993), London (1988) and Toffler (1970) all point to the dysfunctional behavior that is typical of individuals that can no longer assimilate change. These people demonstrate a form of disorientation and related stress responses that can significantly reduce their work (and other social) productivity. These same individuals react to these stresses by resisting the forces that seek to change them. Resistance to change may surprise would-be managers should they regard the current change as only minor while neglecting to consider that any particular individual may have a very different evaluation of the situation. For managers to effect desired changes in today's environment, Conner states that the main ingredient of success for managers is the ability "to understand and use to their advantage the principles underlying basic human patterns that operate during change (p. 57)."

Lewin (1951) spoke of organizational change as occurring in three stages: unfreezing, changing and refreezing. Unfreezing represented a reduction in the forces keeping the organization in its present state. After preparation for change, a transition state was entered wherein new behaviors, values and norms were acquired. Refreezing then stabilized the organization into a form that would continue the new equilibrium. Beckhard and Harris (1987) as well as Conner (1993) have modified those stages in presenting a model that reflected change as a process that included a present state, a transition state and a desired

state. Kanter, Stein and Jick (1992) criticized these simple ways of viewing change by pointing out that organizations are "fluid entities with many 'personalities' (p. 10)," inferring that stages were not clear-cut but rather that they overlapped and irregularly interacted with each other. They further noted that change was very much in the eye of the beholder, reflecting past as well as prospective states. Each individual or group entered the change process at a different point with a different state of readiness. Changes that were most positive to one member of an organization might be extremely negative to another.

Conner (1993) has agreed with the importance of perception in evaluating any individual response to change. His observations as an organizational psychologist working with change over two decades have shown him that the response to any change (either negative or positive) was dependent not only on the final outcomes of that change but also on the degree of influence individuals believed that they exerted within the situational environment.

Resistance to Change

If change were always acceptable to all members of an organization, there would be no need for this study. However, inherent in most changes of significance is a resistance that will vary as to organization, environment, social structure, work function, role, and many other workplace characteristics. Lewin (1951) developed a theory of force-field analysis to represent resistance as a balance between forces that either promoted or opposed change. He reasoned that increasing forces for change would cause an increase of forces opposing the change in an effort to stabilize the imbalance. Since this would increase the resources needed to achieve the changes and cause unconstructive behaviors within the organization, he believed that reducing the forces opposing change was preferable to increasing those in its favor.

Noting that many individuals (representing both management and non-management personnel) might be blind to their own behaviors and the influences of their organizational culture, Argyris (1971) expressed a similar opinion that it would be easier to reduce resistance than to challenge it. Senge (1990), too, expressed the belief that resistance to change could best be addressed by focusing directly on the threats to entrenched norms. He went on to say that people would learn what they needed to learn, not what others thought they should learn. Lewin, Argyris and Senge all, then, pointed toward a learning process that originated with the individual undergoing change. Zaleznik and Moment (1964) noted that change actually would ask someone to become someone else.

Conner (1993) has stated that change is perceived as negative not only because of unwanted effects but often from a sense that the results could not be predicted nor controlled. This would relate the acceptance or rejection of a given change issue to its impact on an individual's ability to control his or her environment. Kanter (1983) went on to add a variety of other factors impacting on change acceptance to include uncertainty, surprise, confusion, loss of face (for previously acceptable behaviors), personal competence to change, increase in work, genuine threat to the individual or past events reducing the credibility of individuals or the organization (lack of trust of management). DePree (1992) noted a need to maintain the comfort of routine as well as the difficulty experienced by many individuals in separating self from the issues at hand.

Overcoming Resistance to Change

Since resistance to change has been recognized and discussed by numerous management theorists (see Bennis, 1966; Blake & Mouton, 1964; Schein, 1987; Senge, 1990; Tichy & Devanna, 1986, among others), it would not be surprising to find many authors offering an

opinion as to the best ways to counter or prevent it. McGregor (1960) found that the success of any form of social influence would depend on the ability to alter the ability of others to achieve their goals or satisfy their needs. He championed, as stated in his Theory Y assumption, the belief that the expenditure of physical and mental effort in work was natural and that most intellectual capabilities of workers were underutilized.

Bennis (1966) noted the presence of risk and fear in the face of change, charging the change agent with the task of assisting the client to prepare for the change. He also saw the development of commitment among organizational members when they were given the opportunity to participate in research processes supporting change. Evidence developed by Lewin (1951) in studying participatory action research supported this same view and emphasized a higher state of morale and change implementation effectiveness. Later Bennis and Nanus (1985) found empowerment to be a source of energy to translate intention into reality. Bennis (1993) restated this view by emphasizing the importance for leaders to communicate their vision and then to involve everyone in the process of change. He found this type of community effort as necessary to overcome a shortfall of knowledge among those in power and a lack of power belonging to those with knowledge.

In discussing the implementation of participative management techniques within an organization, Plunkett and Fournier (1991) suggested that an early involvement of informal leaders of employee groups in the process of implementation would provide a more receptive audience for participatory relationships. The most successful examples that they have seen have included participation at the beginning of the planning stage as members of a steering group that was scheduled to guide the change effort. (Instead, classic organizational change efforts have more closely resembled the simple outline in figure 1 on page 27.)

Schein (1987) posed the need for both the motivation and the readiness to change. In presenting a consultant's view, he noted that the manner of intervention would dictate both the diagnostic information that would become available and the evolution of the consultant-client relationship. Taking a cue from Lewin, he felt that action research was a necessary element in both gathering data and in making the need for change evident to the client organization. The challenge to the consultant was in finding a balance between disturbing the existing state (unfreezing) and maintaining a productive working relationship with the client.

Beckhard and Harris (1987) believed that the key to overcoming resistance lay in providing enough detailed information to allow people to fit themselves into the scenario of the future state. This vision focus for management could find itself in conflict with the common short term managerial response to problems of attacking symptoms rather than spending time to search for underlying causes. Basically management and consultant centered, they related the success of potential change to the level of dissatisfaction with the existing conditions, desirability of selected change(s) and the practicality (riskiness) of the process.

Blake and Mouton (1981) felt that relying on power and authority would increase resistance to change. The best way to change existing norms was to involve those whose behavior was affected in studying and exploring alternatives for the present. This would include participation in defining the problem(s), evaluating pertinent data, examining reasons for the current state and discussing potential changes.

Bridges (1980) presented a discussion of the framework within which people undergo transitions in life. These included an ending of the past, a transition period of directional

decisions and then a new beginning. Tichy and Devanna (1986) have supported this process as a necessary one for individuals undergoing a period of organizational change, finding it valuable to reveal this process to individuals as they are experiencing organizational change. Conner (1993) has basically agreed with this approach and promoted an acceptance of resistance as a natural and almost unavoidable part of the change process.

Oakley and Krug (1993) have seen participative management as the vehicle to reduce resistance by developing a sense of ownership of desired changes. By allowing those most involved in organizational changes to assist in developing "their" solution, change could be effected from the inside out.

Coch and French (1948), Vroom (1964), and Kotter and Schlesinger (1979) along with many others have consistently stated that participation in the change process has shown a tendency to reduce resistance, build a sense of ownership of the desired change(s) and provide the motivation to effect the change(s). Nadler (1981) has added that participation also acts as a vehicle for communicating change information that includes issues that may shape the final form of changes and the effectiveness with which they are achieved.

With a large emphasis on participative management, empowerment and transformational leadership evident in contemporary literature, it was surprising to find that more modern change theorists had not sought to address methods for reducing the impact of change resistance using aspects of those concepts. Unlike Oakley and Krug who hint at involvement as a key to developing organizational support for change, most writers appear to be content to accept resistance as natural and then to allow it to run its natural course. By not having taken advantage of the possibilities of participatory action research as pioneered by Lewin almost fifty years ago, these modern change artists might have passed over a very important

tool with the capability of accelerating the acceptance of change.

Organizational Change in Practice

According to Nadler (1981) change can be seen as presenting three major problems: resistance, control and power. These further lead to a need to motivate people to change, to establish a means to manage the transition, and to shape the political aspects of the change.

Whether change is attempted using the structure of a model or methodology, whether guided by internal or external change agents, it seems to take a common form. (Please see Figure 1.) Initially, a crisis of sorts must be perceived to exist in order to stimulate the need for change, this often first occurring at the most senior levels of the organization. Then a problem solving format similar to that outlined by Manzini (1988) is followed:

1. Data gathering provides information;
2. Diagnosis results from an analysis of the data and a problem is defined;
3. Feedback to the organization (or senior staff) leads to planning;
4. Implementation of the plan occurs;
5. Some evaluation of the changes implemented measures success; and
6. An iterative process further refines the changes or a new problem-solving process is commenced.

Unfortunately, this very process tends to ignore a major theme that unites the aspect of resistance to change outlined earlier. Individuals not involved in the early aspects of the problem-solving effort first interact with the intended change when the actual implementation actions begin. They then sense a lack of influence or control over directions that may immediately affect them. A cycle of overt or covert resistance may commence that can lead to a confrontational environment between the change agents and the change

recipients. This emotional response will occur regardless of the cognitive content of the changes. This would be an approach specifically noted by Lewin (1951), Argyris (1971) and Senge (1990) as unwise and costly in terms of resources.

Organizational Change in Practice

Change Step	Accomplished By
Perception of Crisis	Leader
Gathering of Data	Staff
Diagnosis of Problem	Senior Staff
Planning	Leader/Senior Staff
Plan Implementation	Line Management
Evaluation	Leader/Senior Staff
Plan Modification	Leader/Senior Staff

Figure 1. Typical change steps as practiced in organizations as per Manzini (1988)

If this rather classic practical model for organizational problem solving and change appears to be so obviously flawed in the face of past research, why has no solution emerged? Why have the consultants using it and the organizations affected by it not acted more decisively to change it. To answer these questions adequately from the literature, it is

necessary to quickly review management theory and practice as they have developed during the last century.

Management as Theory

Basing many of his ideas on his experiences at various industrial firms, Frederick W. Taylor (1856-1915) introduced the concept that worker productivity could be positively influenced by the introduction of scientific guidelines. His beliefs regarding scientific management tended to push human performance into a framework defined by the growing efficiency of the industrial machines of his lifetime (Taylor, 1947). Although a practitioner, Taylor provided many of the concepts later adopted by various administrative theorists (Kast & Rosenzweig, 1985).

Max Weber (1864-1920) was among the first to study the formal structures of organizations and the authority relationships within them. He is probably best known for his bureaucratic model, but he contributed significantly in studying organizations from historical and social viewpoints as well. Because he was impressed by the industrial and military organizations he observed in his native Germany and was also concerned with the perceived unreliability of humans within that structure, he developed a system that could function in a rational manner in spite of its human weaknesses (Bennis, 1966).

From these two key theorists twentieth century organization theory had its beginnings. As would be expected, the structures were designed to limit the impact of human frailties and maximize the efficiencies that were so clearly visible with machines and emerging technologies. There was a strong element of "dehumanization" present.

A French industrialist, Henri Fayol, developed fourteen principles to guide managers as well as defining administration in terms of planning, organization, command, coordination

and control (Fayol, 1949). Between 1920 and 1940 two employees of the Bell System, George Edwards and Walter Shewart, made two significant contributions that were to form the basis for later quality management efforts. Edwards coined the term "quality assurance" and suggested that quality was a management issue (Harrington, 1983). Walter Shewart developed the concept of statistical quality control, which could be used to monitor quality during mass production runs (Shewart, 1931).

The focus of the preceding and most other management theorists prior to 1930 was on finding a way to organize and quantify the process of management. This largely followed trends in the American society, a society that increasingly worshiped technology as a savior and the surrounding scientific method as a litany. The work environment tended to be dehumanized with human productivity regarded as subject to various scientific principles. With the Hawthorne experiments conducted at Western Electric between 1927 and 1932, Elton Mayo and Harvard colleagues F. J. Roethlisberger and T. N. Whitehead (1939) determined that social and psychological factors must be considered as important in determining worker productivity and satisfaction. These first human relationists were complemented in their work by a variety of others who included Sigmund Freud and his followers, who dealt with the impact of individual attitudes and sentiments on behavior. Vilfredo Pareto's work in general sociology actually set the stage for the Hawthorne studies, and a variety of management authors, Mary Parker Follett and Chester Barnard among them, began to develop human behavioral leanings (Drucker, 1973; Kast & Rosenzweig, 1985).

Peter Drucker (1992) has pointed out that the development by the United States of large-scale training during World War I (and refined during World War II) supplanted the German concept of apprenticeship. This demonstrated the importance of academic education in

rapidly acquiring skills that had previously been limited to a slow process of one-on-one experiential development.

Quality circles, developed for and used extensively in U. S. industry during World War II, moved to Japan and were applied most successfully in concert with statistical quality control. Douglas McGregor (1960) and Chris Argyris (1964) added the perspective of replacing authoritarian concepts with democratic-participative ones.

Abraham Maslow's (1943) hierarchy of needs was complemented by Frederick Herzberg's (1966) research among engineers and accountants regarding job satisfaction. Their work provided insights regarding the motivation of human workers within the society as a whole and specifically within the workplace.

As this work was first being recognized, the work of Edwards Deming (Walton, 1986) and others was helping to build a quality oriented management culture in Japan. These theories merged quantitative measures such as statistical process control with a strong dose of human behavioral aspects to achieve a balance between human and production aspects that had been lacking within the American workplace.

Theories in Practice

The period from 1960 to the present has been marked by many attempts to formulate comprehensive approaches to organizational leadership and management. Organization development (OD) was developed around the belief that improving the functional interpersonal structures would lead to a more productive work environment. Bennis (1969) noted that OD concentrated its energies on the values, attitudes, relations and organizational climate (the people variables) rather than on the more abstract goals, structures and technologies. Management by objectives (MBO) provided a hierarchy of goal statements

to guide individual productivity in support of organizational goals (Odiorne, 1965).

Contingency views that stressed flexibility to meet varying human and environmental situations became popular in the 1970s as differences in leaders, followers and tasks were recognized. Hersey and Blanchard (1972) proposed that the style of leadership should be adjusted with the maturity of the follower. Blake and Mouton (1964, 1978) proposed the managerial grid that suggested a balance of concern for people with that for the task to be accomplished. Literature available to practitioners has also included a large number of works that advertised specific organizational successes with both private sector (Collins & Porras, 1994; Kanter, 1989; Naisbitt & Aburdene (1985); Sculley, 1987; and Segal, 1989) and public sector (Osborne & Gaebler, 1993) examples.

During the greatest part of this developmental process for management theory and practice, theories concerning change were not given much specific attention. Of exception would be the work of Lewin (1951) and his followers in the area of group dynamics. His concept of unfreezing, changing and then freezing a group's behavior was incorporated into the approach of many OD practitioners.

The first evidence of the present change movement was probably voiced by Peters and Waterman (1982), who were among the first to begin to publicize the need for significant organizational changes to improve American economic competitive performance. As U. S. industries found themselves increasingly less able to compete economically on a global basis, the founding fathers of the Japanese quality movement, Edwards Deming, Joseph Juran and Philip Crosby among them, suddenly found themselves in high demand. This return of American-originated quality management concepts to the United States has, in turn, fostered an almost explosive growth in the development of tools and research to guide

change efforts.

The first proponents of large-scale organizational changes (Crosby, 1979; Deming, 1986; Peters & Austin, 1985; Peters & Waterman, 1982) spent considerable time establishing a need for change by developing a sense of crisis. This would certainly correspond to McGregor's (1960) feeling that "A satisfied need is not a motivator of behavior (p. 36)."

The significant economic successes of Japanese business concerns during the 1980s served as a vivid example of the powers of a consistent management philosophy devoted toward customers and product quality. Joel Barker (1992) stated (as also seen in several video productions that were widely distributed) that the boundaries of thinking should be redefined. Words such as paradigm, culture and change began to be frequently used and intermingled.

Total Quality Management (TQM) was mirrored by numerous related quantitative-based philosophies that preached the need to modify existing management practices so as to increase the use of statistical process measurement techniques. Implementation approaches seemed to dictate the need for the visionary leader, greater participatory management and increased decentralization of decision making (Hunt, 1992).

Kotter and Heskett (1992) concluded that even strong strategically appropriate cultures could not promote excellent performance unless they included norms and values that would promote adaptation to the environment. Additionally, they found that organizational cultures that successfully supported changes seemed to be guided by a drive to meet the legitimate needs of customers, employees and owners.

Yet, after almost a century of management theory and practice based upon a broad range of research within many complementary disciplines, society as a whole has continued to

struggle with the ability to adapt its institutions effectively (Bellah, Madsen, Sullivan, Swidler & Tipton, 1991). In spite of a wealth of literature arriving on the scene at present, few new thoughts on the actual change implementation process have been introduced. We have seemed to continue the descriptive dialogue noted by Bennis (1966) with little progress toward the development and practice of more consistently effective change implementation methodologies. This has, perhaps, indicated that the answer, if one does exist, might lie within existing research in some form or another.

Since organization development was originally proposed specifically to effect changes in organizations, revisiting its origins in more detail may provide additional information essential in laying the groundwork for an effective change implementation methodology.

Organization Development

The exact beginnings of the practice of organization development are subject to debate but appear to have occurred in the mid 1950s with roots extending to the years immediately following World War II. Bennis (1966) dated the beginnings of OD specifically to a series of laboratory training programs initiated by Blake and Shepard in 1958 for the Esso Company. Ciampa (1992) has credited Humble Oil with having begun an OD effort in 1956 that included laboratory training, the Managerial Grid, participative management, employee attitude surveys and several related techniques. McGill (1977) credited Leland P. Bradford of the Federal Security Agency for having introduced in 1945 the concept of training as an integrated concept wherein both the individual and organization could benefit mutually. He along with other managers of his time sought techniques that could identify problems, provide solutions and then repeat the sequence as needed. Most training in existence at the time was very narrow in scope (focused on basic job skills) and tended to come into being

only at the time of a crisis.

At about the same time (the summer of 1946) Kurt Lewin and his staff at the Research Center for Group Dynamics at MIT developed a special workshop for community leaders. Over the initial objections of the researchers (Lewin among them) who had been observing the sessions, the community leaders joined the feedback meetings where the session dynamics were discussed. This first "T-group" demonstrated to the participants, training leaders (among them being Ken Benne from Columbia, Lee Bradford, and Ron Lippitt from MIT) and researchers that there was valuable learning to be achieved in reviewing group interactions. In addition, it became apparent that the behavior feedback process could provide considerable benefits to the participating organizations in future situations unrelated to the specific workshop or training sessions. This experience provided the beginnings of the National Training Laboratories (NTL), and financial backing from such organizations as the Carnegie Foundation, the National Education Association and the Office of Naval Research followed (Bradford, Gibb & Benne, 1964; Ciampa, 1992; and Huse, 1980).

Kurt Lewin also was involved in a separate contributing OD foundation through his work in survey research feedback. Although he died in 1947, his work was continued by his staff, which moved to the University of Michigan to join with the Survey Research Center, later to become the Institute for Social Research. One of the first studies reported on the success of the use of employee attitude surveys by Detroit Edison in 1948. Sessions between supervisors and immediate subordinates discussing the major findings were conducted, beginning with senior managers and then progressing throughout the organization. A repeat of the survey in 1950 under more carefully controlled research conditions indicated that positive changes could result from the process (Mann, 1962).

In the early 1960s the industrialized countries were involved in a period of rapid and pronounced expansions that were leading to ever more complex organizations. As the size and internal activity specialization grew, the control structures also grew. Bennis (1966) noted that leaders and managers, facing more and more bureaucratically imposed authority structures, information procedures, communication difficulties and decision networks, were experiencing difficulties in implementing many of the suggestions and concepts that were emerging from studies in the behavioral sciences. Central to reestablishing functional interpersonal structures was the need to teach affected personnel to work more effectively with each other and within the structures of the organization while merging theory with practice.

Lewin (1947), Allport (1960) and others had reported evidence that the morale of individuals who were allowed to participate in decisions affecting them tended to be higher and that they would implement those decisions more effectively. Argyris (1962) also had postured that interpersonal competence which relied upon situational awareness, diagnostic sensitivity and behavioral flexibility was a necessary managerial tool. Bennis (1966) saw laboratory training as the instrument to merge key behavioral skills with organizational needs to bring theory and practice together.

Margulies and Raia (1972) have noted that early OD practitioners felt that the development of interpersonal working skills would allow organizations to self-adapt to the existing environment and, therefore, concentrated on the personal-cultural subsystem. The authors found this to be an over-simplification that often led to a disregard for properly designing various control and reward systems, selecting the most appropriate accounting methods and the like. They further argued that power and authority structures, formal and

informal organizations, technology applications and production line procedures deserved their fair share of attention.

Some of the first efforts were also frequently marked by a concentration on "processes" at the expense of final "results" (Odiome, 1987). This not only made the value of the effort very difficult to assess, but the goals of the organization were often neglected in forming the intervention strategy. Schaffer and Thomson (1992) have argued that a focus on results during a change program could provide four benefits that an overemphasis upon processes might miss:

1. Companies would change only those aspects of the culture that are in need of modification.
2. Constantly reviewing the success of various innovations would reveal those things that work.
3. By breaking the change process into frequent successes, personnel affected by the changes would be motivated to continue the process.
4. Each phase of the program could build upon the successes of the previous phase. This could lead toward producing fundamental shifts in the performance of the organization.

Evans (1989) has theorized that OD could be self-limited because it has emphasized what might be construed as feminine concepts (a nurturing environment concerned with the quality of work life and an open expression of feelings) in a culture that is dominated by masculine thinking. Yet it has been accepted because of the embodiment of other more mainstream ideas such as balancing a tolerance for risk-taking with a need for risk-minimization. He further noted that OD has proven most successful and has become integrated in those national cultures where feminine values are most accepted, such as the

Scandinavian countries.

Although several authors, Margulies and Raia (1972) and Evans (1989) among them, have criticized the practice of OD for an overly strong emphasis on human behavioral aspects at the expense of including the technical structures of an organization, it would seem that a merger of technical and human views is, in fact, emerging as more effective than either extreme.

Blake and Mouton (1964) proposed the Managerial Grid in 1961 as composed of six phases that provided a framework for integrating human behavioral aspects and the technical needs of the organization. They included:

Part I. Management development within an organization.

Phase 1. Managerial Grid Seminar training.

Phase 2. Teamwork development.

Part II. Organization development.

Phase 3. Horizontal and vertical intergroup linking.

Phase 4. Setting organizational goals.

Phase 5. Implementing planned change by attaining established goals.

Phase 6. Stabilization (p. 265).

They went on to note that Phases 1 and 2 were designed to aid individuals and teams increase their performance within the existing environment. Phases 3,4 and 5 were designed to improve organizational effectiveness. Phase 6 was established to stabilize the organization with changes in the interest of increased effectiveness in place. In light of Lewin's (1951) work, it should be noted that Phases 1 and 2 equate roughly to "unfreezing" the organization, Phases 3 to 5 to a "change" or transition step and Phase 6 to a final form or "refreezing"

stage.

Just as there has been a call to balance human and technical factors, results and processes seem to call for their appropriate places in the search for organizational improvement. This would further ask for the inclusion of double-loop learning (Senge, 1990) so that processes and results would be viewed together to ensure that maximum value to the organization as a whole would be achieved. In a parallel process Covey (1991) would expect that proposed changes be based on sound principles rather than address only the surface symptoms of problems.

Ciampa (1992) has pointed out that integrated, more comprehensive approaches were attempted in the late 1960s and early 1970s but met with limited success, leaving early practitioners of that art more of a pioneering, research-worthy curiosity than a model. Pasmore and King (1978), however, found that only a sociotechnical intervention could be associated with major productivity gains and cost savings. They argued that "the interactions between people and technology and among people themselves are what make the organization more than just an aggregate of individual efforts (pp. 466-467)." With the passage of time it has become apparent that a more integrated approach, coupling human and technical structures, has emerged. Fagenson and Burke (1990) verified an increasing use of technostructural interventions in organizations.

Ciampa (1992) associates the human aspects of the quality movement directly to OD origins but does not go so far as to note a link to quality related technical issues. However, a key aspect of the OD approach is the gathering of information regarding the state of the organization. Statistical information, occupying a very prominent position in most quality improvement schemes, serves almost an identical purpose. The need to collect information

of a relatively unbiased nature has often led OD practitioners to utilize survey instruments in combination with qualitative informational gathering techniques. It would seem that the use of statistical methods, strongly recommended by Total Quality Management proponents (Walton, 1986) is only a refined aspect of information gathering and complements existing OD methodologies nicely.

The Deming Management Method

1. Create constancy of purpose for the improvement of product and service.
2. Adopt the new philosophy.
3. Cease dependence on mass inspection.
4. End the practice of awarding business on price tag alone.
5. Improve constantly and forever the system of production and service.
6. Institute training.
7. Institute leadership.
8. Drive out fear.
9. Break down barriers between staff areas.
10. Eliminate slogans, exhortations, and targets for the workforce.
11. Eliminate numerical quotas.
12. Remove barriers to pride of workmanship.
13. Institute a vigorous program of education and retraining.
14. Take action to accomplish the transformation.

Figure 2. The Fourteen Points as per Walton (1986)

Until the development of personal computers, information gathering and analysis techniques were not so limited by their availability as by the inability to process large amounts of information (surveys, for instance) rapidly so as to provide timely feedback. Manual data entry, limited access to a few capable computers and the very expense of

operating those computers often has led to the use (or misuse) of standard instruments or those which could be analyzed easily in the field. The advent of the personal computer has almost erased these limitations in information analysis and may help to establish more links between the work of OD consultants and quality improvement specialists. By using this technical asset as a key assessment tool, consultants may drive the integration of human resource aspects of organizational change.

The current quality improvement movement, as reflected by the work of Edwards Deming, tends to show strong similarities to the values of OD, reflecting both human and technical aspects of organizations. The Fourteen Points of the Deming Management Method (see Figure 2) as stated by Walton (1986) include an emphasis on building strong functional teams, a well-trained workforce and behaviorally sound managers and leaders. Among the tools frequently used, statistical monitoring is designed as a quantitative diagnostic tool that is applicable to both human and technical structures.

People and Change

Several academic disciplines have contributed heavily to the development of organizational development and the entire human behavioral field. Among them, psychology is perhaps the single most dominant. However, problems arise when allowing one discipline to have undue influence to the detriment of achieving an integration of relevant knowledge. Bennis (1965) looked on planned change as a linkage between theory and practice, tying knowledge to action. At that time he found it assuming a role of converting variables from basic disciplines into strategic programs.

In order that any organization significantly change its culture, the people of that organization will need to change in some way or ways the manner in which they routinely

do business. This infers that the people themselves will most likely be called upon to change something. Or perhaps it can be stated that the organization will change, and the individuals who will become successful in the new environment will need to adapt their behaviors accordingly. In any case, individuals will need to change.

Conner (1993) speaks of the powerful influences control has on the manner in which people perceive and respond to change. Noting three implications concerning this human reaction to change, he states:

1. Change is considered major when it is perceived to be so by those affected.
2. Major change is the result of a significant disruption in established expectations.
3. Major change occurs when people believe they have lost control over some important aspect of their lives or their environment (p. 74).

This also can bring into play a broad spectrum of human behavioral knowledge in assessing the impact of new methods or in planning a successful change from its conception. A reorganization would need to assess the group dynamics and the associated human relationships. This leads to a need for knowledge pertaining to human relations such as how the size of a particular group, for instance, affects the number of relationships that can develop (Hare, 1976). Abraham Maslow's (1987) work in motivation theory that brought together into a single theoretical structure concepts championed by Freud, Adler, Jung, Levy, D.M. Levy, Fromm, Horney and Goldstein has been followed by a wealth of research and associated ideas designed to motivate employees and improve the environment of the workplace (Cranny, Smith & Stone, 1992; Gellerman, 1992; Levering, 1988; Rayner, 1993).

If change is to occur, the motivation to change will be a key factor to address. Frederick Herzberg's (1966) conclusion that the best way to motivate employees was to increase

satisfiers, job characteristics that relate to human higher-order needs such as achievement and recognition, led to the concept of job enrichment. During a large-scale organizational change a failure to pay attention to the satisfiers (or dissatisfiers on the other side of the issue) may well significantly impact upon the ultimate acceptance or rejection of desired changes by those affected thereby.

The manner in which men and women communicate differently (Tannen, 1986, 1990, 1994) or value relationships as opposed to abstract rules (Gilligan, 1982) impacts directly upon a leader's ability to guide an organization through a period of significant changes. Maslow's development of a hierarchy of needs also may help the leader to anticipate the impact of changes to different individuals. As an example, the perception that an individual might well lose his/her job certainly impacts upon security or even physiological needs; to another a change in the nature of assigned work might well be equally as upsetting or stressful.

There is certainly a wealth of research and knowledge that can emerge from the world of psychology to assist the change agent in guiding large-scale organizational changes. The related discipline of organizational psychology has further refined many psychological issues into those specifically reflective of organizations and the individuals within those organizations. As noted earlier, changes to an organization infer that individuals within the organization have learned something. This means that research into learning processes, such as operant conditioning (humans being conditioned by various environmental forces) as studied by B. F. Skinner(1953), may also be relevant.

If there is a significant weakness in the application of psychological research to organizations, it is a tendency to reason that if a characteristic applies to an individual then

it can be applied to a group. If it applies to a group, then it is also applicable to large organizations. This line of reasoning seems to be an outgrowth of Kurt Lewin's (1951) work that formed the basis for field theory that was the beginning of the study of group dynamics. As a starting point much of Lewin's language used terms that had previously been applied to individuals, and he simply reapplied them to groups. Although this was probably not an important issue at that time (late 1940s and early 1950s), the failure to note the limitations brought on by the use of language developed for other purposes may have led to a confusion of boundaries between individuals and groups as well as groups and organizations (very large groups).

In reviewing other social sciences for their ability to contribute to the body of knowledge valuable to the change theorist or practitioner, both sociology and political science offer additional insights. Sociology as a source of information regarding human social behavior can provide valuable insights regarding those who populate organizations. Understanding social norms and values and linking their relationship with cultural change are important in addressing the instability and disorganization that may appear during a period of marked change. The institutionalization of changes into stable, fully-integrated forms within an organizational structure falls well within the discipline of the sociologist (Broom & Selznick, 1963). As noted by Kelman and Warwick (1973), socialization is the process by which individuals acquire the various characteristics (knowledge, skills, motives and feelings) expected of them by the groups to which they belong or seek to belong.

Political science provides important insights on the issue of power as well as the political characteristics of different societies, to include both governmental and private sector organizations. Understanding the political implications of changing the structure and/or

relationships within an organization may well determine the success or failure of a given desired change. Likewise, such seemingly remote social sciences as economics, history, anthropology and social work all can serve an appropriate part in changing organizations (Thio, 1989).

Leadership and Change

Leadership is, in a sense, partially defined by its relationship with change. As Rost (1991) has stated, "Leadership is an influence relationship among leaders and followers **who intend real changes** that reflect their mutual purposes (p. 102)." Conner (1993) goes on to say that "Effective leaders are capable of reframing the thinking of those whom they guide, enabling them to see that significant changes are not only imperative but achievable (p. 9)." Tichy and Devanna (1986) liken the transformation of organizations from one state to another to a three-act play that consists of recognizing a need for revitalization, constructing a new vision and then institutionalizing change. They have identified a number of common characteristics that they associate with transformational leaders:

1. **They Identify Themselves as Change Agents.** Their professional and personal image was to make a difference and transform the organization that they had assumed responsibility for. (p. 271)
2. **They Are Courageous Individuals.** These are prudent risk takers, individuals who take a stand. (p. 271)
3. **They Believe in People.** They are powerful yet sensitive of other people, and ultimately they work toward the empowerment of others. (p. 273)
4. **They Are Value-Driven.** Each one of our transformational leaders was able to articulate a set of core values and exhibited behavior that was quite congruent with

their value positions. (p. 274)

5. They Are Life Long Learners. As a group, our protagonists show an amazing appetite for continuous self-learning and development. (p. 276)
6. They Have the Ability to Deal with Complexity, Ambiguity, and Uncertainty. Each of our transformational leaders was able to cope with and frame problems in a complex, changing world. (p. 279)
7. They Are Visionaries. Our transformational leaders were able to dream, able to translate those dreams and images so that other people could share them. (p. 280).

There is a large school of change theorists that believes real change to be the prerogative of management, particularly senior management. Among them are Beckhard and Harris (1987), Peters and Waterman (1982), Peters and Austin (1985), Kanter (1983) and Deming (1986). All these theorists (and others not listed) believe that change is initiated and then guided from the top of the organization. In most cases they see successful change as embodied in changes among senior management personnel, structures and behaviors, which later find their way into the character and culture of the organization. Interestingly, this was not substantiated by the research of Dunn and Swierczek (1977), whose study of 67 successful and unsuccessful change efforts showed neither a top-down nor a bottom-up approach to have a consistent relationship with success. Only collaborative methods that involved participative orientations showed any true relationship to successful change.

Nadler (1981) has noted that "leaders can enhance change efforts in various ways, including emphasizing the need to change, articulating the future state, modeling behavior consistent with the future state, rewarding those who aid the transition, and by expressing support for the organization's ability to successfully make the transition (p. 205)." In

discussing their social technology for changing the way organizations change, Dannemiller and Jacobs (1992) sought to guide change in large and complex organizations through the increased ownership and commitment of the change effort by all affected parties, a faster implementation of plans, and the involvement of organization members in making ongoing changes supporting the change directions. They noted that this contrasts with the tradition of limiting strategy development to senior management although "it has become critical that all organization members have a clear understanding of the strategic direction of the whole system so that everyone can act with strategic purpose (p. 491)."

Further promoting a participative approach, guided by the existing management structure, Axelrod (1992) has described an organizational change process structured around a series of conferences. These conferences involve organization stakeholders who then participate in conferences developing an understanding of (a) the organization's past, present and future vision, (b) internal and external customer requirements and (c) internal technological processes. Following these "data base" efforts, conferences to design and then implement changes conclude the overall process. As a result, "the total time for the change effort is reduced because there is less resistance associated with this process as a result of the large number of organizational members who have been able to participate in and who influence the direction of change (p. 508)." Through an expenditure of time in participatively planning and preparing for change, involvement and, thereby commitment, are created.

Bennis and Nanus (1985) state that the organization's social architecture can be transformed by creating a new, compelling vision, developing commitment for that vision and then institutionalizing it. They go on to say that in order to institutionalize this new vision, "Changes in management processes, the organizational structure, and management

style all must support the changes in the pattern of values and behavior that a new vision implies (p. 144)."

The literature seems to clearly establish the importance of leadership to the successful achievement of organizational change. In a reciprocal manner, it is change that presents the major challenges that demand leadership. Yet after a century of Scientific Management and management science, leadership, empowerment, participative management, behavioral science, psychology, organizational psychology, sociology, social psychology and a host of other "-ologies," we still appear to be looking for consistent methods for effecting desired or planned changes.

Key Points from the Literature

The authors cited in the literature review and a host of others would most likely agree, almost unanimously, that change is a most complex process. Unfortunately, in spite of a wealth of research and an almost unlimited number of case studies mirroring both successes and failures, a steady methodology for implementing change has not developed--at least not one that can be consistently recognized and reused by needy practitioners. It is perhaps this great wealth of potential information, the complexities involved in individual and organizational change, and the widely varying environments within which the many change efforts have taken place that have made very difficult the identification of a single or few techniques that have tended to be the most successful.

In addition, significant successes have been noted by the many authors who have reported their case studies in both academic and practitioner literature. These very successes may have masked the need for a general methodology other than to use commonly reported consultant approaches such as outlined by Bennis (1966), Blake and Mouton (1964), Schein

(1987), London (1988), and others.

Yet from this seemingly confusing and sometimes contradictory maze of writings, a few interesting and well-founded stepping stones have seemed to emerge from which to build a pathway through the transition period toward the new tomorrow. These key points may be summarized as follows:

1. **CHANGE/CHANGING.** There is much information available regarding the issue of **change** as well as many examples of **change**, however, the literature remains weak in proposing answers regarding the ways to consistently perform the act of **changing** an organization to its desired state. In the almost 30 years since Bennis (1966) first commented on that very issue, academicians and practitioners have accumulated a wealth of human behavioral knowledge as well as organizational information, but it has remained a task for today to bind that information into a form that will serve a society whose institutions and organizations are under severe pressures to change to some other state.

2. **LEADERSHIP/PARTICIPATION.** Although it is widely agreed that senior leaders will most likely provide the vision for an organization after often being the first to recognize the need for change, the practice of expecting those at the top of a pyramidal organization structure to be able to plan and then execute a successful change strategy without broad support from the general members of that same organization is now suspect. As Dunn and Swierczek (1977) noted, collaborative approaches to large-scale organizational changes tend to produce success more often than either top-down or bottom-up approaches. As Lewin (1947) and Allport (1960) reported much earlier, early participation in a change process tended to build ownership while simultaneously reducing resistance to change.

3. **INTEGRATION/FLEXIBILITY.** The large number of concepts relevant to the

change issue has created a difficult task for both theorists and practitioners because of the need to both develop a familiarity with a wide variety of fields of knowledge while at the same time being able to recognize the appropriate means of applying that knowledge in the best manner to serve any particular organization facing a particular situation. Figure 3 provides a listing of some of the most important concepts relevant to the organizational change process while also listing a few of the most important authors as they impact this research study.

Summary of Key Change Concepts and Sources

Concept	Literature
Definition	Lewin (1951), Beckhard & Harris (1987), Connor (1993), Morris (1995)
Culture vs Character	Mohrman et al (1991), Ciampa (1992), Kotter & Heskett (1992)
Sense of Crisis	Toffler (1970), Deming (1986), Drucker (1991)
Resistance to Change	Lewin (1951), Kanter (1983), Conner (1993)
Overcoming Resistance	Lewin (1951), Argyris (1971), Senge (1990)
Goal Alignment	McGregor (1960)
Forces for/against Change	Lewin (1951), Argyris (1971), Senge (1990)
Ownership/Commitment	Lewin (1951), Bennis (1966) Beckhard & Harris (1987), Oakley & Krug (1991)
Empowerment	Blake & Mouton (1981), Bennis & Nanus (1985)
Readiness for Change	Schein (1987)
Feedback	Lewin (1951)
Organization Development	Bennis (1966, 1969), Margulies & Raia (1972) Ciampa (1992)
Motivation	McGregor (1960), Herzberg 1966), Maslow (1987)
Communications	Gilligan (1982), Tannen (1986, 1990, 1994)
Implementation Direction	Dunn & Swierczek (1977)
Leadership/Vision	Nadler (1981), Bennis & Nanus (1986) Tichy & Devanna (1986)

Figure 3. A summary of key points from the literature and representative writers speaking to those concepts.

CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

The purpose of this study is to document and refine a methodology that can be used to assist organizational change agents in effecting large-scale organizational changes. Institutions, whether they reside in the private or public sectors, often face the need to adapt to significant changes in their respective environments. The recent wave of changes proposed under the quality improvement and reengineering banners are only the latest management schemes devised to make the American society more prosperous. Certainly new concepts will appear in the future just as the quality movement was preceded by a variety of other concepts (management by objectives, quality circles, and situational leadership, for example). In spite of numerous cycles of new concepts, reorganizations and reengineering, organizational leaders have often been without adequate tools when changes have been required. Successes have not been frequent and predictable, and often success or failure could only be measured in the survival or demise of the organization.

This study was designed to build a foundation for an organizational change methodology that might ultimately lead to the development of a practical organizational change structure to support leaders faced with large-scale changes in the future. The idea for this study comes from my personal involvement in organizational changes as a leader, participant and observer for the past twenty years. The study combines my past and present observations with existing literature and field work to describe one methodology that shows promise for further development and assessment.

Background to the Research

Prior to the commencement of this study I had observed and participated in a variety of experiences that influenced my desire to examine an organizational change methodology. The construction of the strategy to be reviewed was a direct outgrowth of over twenty years of organizational change practice that began in the early 1970s and continued to the present. Because this background was very important in establishing links to key research and related experts, this study combines historical information as to methodology origins with field tests of its most current form to provide both academic and practitioner insights.

In 1981, as a commissioned officer in the U. S. Navy, I was assigned to the staff of the Commander Naval Air Force, U.S. Pacific Fleet (known as COMNAVAIRPAC). Prior to that assignment I had participated in numerous modifications designed to make organizations more efficient or effective. My role with that staff was to supervise a team of senior enlisted personnel in support of programs that related to the quality of life of the 55,000 officers and enlisted personnel who reported to COMNAVAIRPAC as their commander. Among the programs which were my responsibility, the enlisted retention program had been established to assist Navy units to retain qualified personnel whose contractual obligation to the Navy was approaching its end. The COMNAVAIRPAC staff personnel who preceded me to this assignment were already practicing an organizational change strategy tailored to the retention program needs. Their efforts were receiving Navy-wide recognition because of their program's demonstrated success.

Having observed the retention program improvement methodology work with considerable success during three years with the COMNAVAIRPAC staff, I was asked as a naval reservist in 1985 to address retention problems with the naval reserve environment.

Where the strategy had shown remarkable successes with the active naval forces, it failed miserably with the reserve forces. Although the environments were significantly different, it appeared to me that the poor results with the reserve forces involved a failure in the actual implementation efforts, most specifically in the area of leadership. However, one aspect of the naval reserve program was strikingly apparent: the demonstrated enthusiasm of the affected people for building a better organization and yet their general exclusion from the change implementation process. Having observed the retention improvement strategy as a participant observer in both successful and unsuccessful implementation efforts, I believed that I could design a more general methodology that could be used by any organization attempting large-scale changes and which, if followed, would provide a consistent likelihood of success.

Upon examination the successful organizational change efforts (Martin, 1981-83, 1982, 1991, 1992) had all followed a pattern that included the following steps:

1. An uncoerced invitation extended to the change consultants that included a recognition by senior leaders that there was indeed a severe problem, the solution of which seemed to require resources that were not then available to the organization. (**Crisis recognition by senior management resulting in a voluntary request for assistance**)

2. The rapid response of the organizational change consultants working with the requesting organization's key members to effect the change process. (**Rapid and participative response**)

3. Data gathering by the use of a tailored survey, interviews and personal observations before the details of a strategy for change were recommended. (**Qualitative and quantitative data gathering to support a data-based decision-making process**)

4. Briefings (during the survey week) to all supervisory personnel regarding the preliminary findings. (**Feedback**)

Pattern of Successful Consultant-Guided Change Efforts

Crisis Recognition by Senior Management

followed by a

Voluntary Request for Assistance

then a

Rapid and Participatory Consultant Response

that included

Qualitative and Quantitative Data Gathering

to support a

Data-Based Decision-Making Process

characterized by

Feedback, Participative Management and Team Building.

To continue a process of iterative improvement

Evaluation,

Long-Term Support and Education

followed.

Figure 4. Observed pattern of successful organizational change efforts.

5. Assistance in forming multi-disciplinary teams to finish defining problematic issues and to begin developing solutions. (**Participative management and team building**)
6. Monitoring and feedback to the organization of long-term results to reflect change progress. (**Evaluation**)
7. Long-term assistance in acquiring needed outside resources to include personnel training. (**Long-term support and education**)

Pilot Study

In 1991-92 I was asked by the leader of a division (about 100 people) within a government research laboratory to assist him in effecting changes to his organization. Since he desired both qualitative and quantitative information (of a nature resembling that produced during the diagnostic phase of the retention improvement efforts), we agreed that a participative survey development method would aid data collection and subsequent change efforts.

Starting with the general steps included in Figure 4, I outlined a methodology that could be adapted to many different environments, including that of the government laboratory. The first step, crisis recognition by senior management, was considered to be a necessary precondition to beginning the process (Ciampa, 1992; Kanter, 1983; and Mohrman et al, 1989). The final steps, evaluation, long-term support and education, were not considered to be part of the change initiation process and were not included in this pilot test.

Interviews of representative organizational members helped to define a survey instrument. Following survey data collection, an open information session during which the survey results were discussed with organization personnel provided additional insights to the data collected. This effort (Martin, 1991, 1992) served as a pilot for the development of a more

flexible diagnostic process and furthered my belief that a participative information collection and analysis process could assist an organization to achieve significant changes.

This pilot implementation effort helped to define the methodology reviewed for this study and helped to define a much greater participative role for organization members in framing the beginnings of a change effort. The historical events that preceded this study and provided the framework for the change methodology are summarized in Figure 5.

Study Background Summary		
Time Frame	Methodology	Key Additions
1981-83	NAVY RETENTION MODEL	Use of Surveys Cross-Functional Teams Ownership of Changes
1985-86	NAVAL RESERVE APPLICATION	Energy for Change Reduced Resistance Feedback Leadership Effects
1991-92	GOVERNMENT LABORATORY APPLICATION	Participatory Process Need for Timeliness Need for Consultant Guide
1993-94	THE SAWTOOTH TECHNIQUE	Private Sector Environment

Figure 5. Background of Change Methodology

Overview of the Research

The current research was designed to proceed on two parallel paths which were relatively independent of each other. A field study was constructed to test a version of the change

methodology in two private sector organizations, and a related study was outlined to trace the methodology's origins with the intent of linking it to relevant literature. At the conclusion of the two independent paths the information collected was merged to develop conclusions reported in Chapter V. The research procedure is outlined by Figure 6.

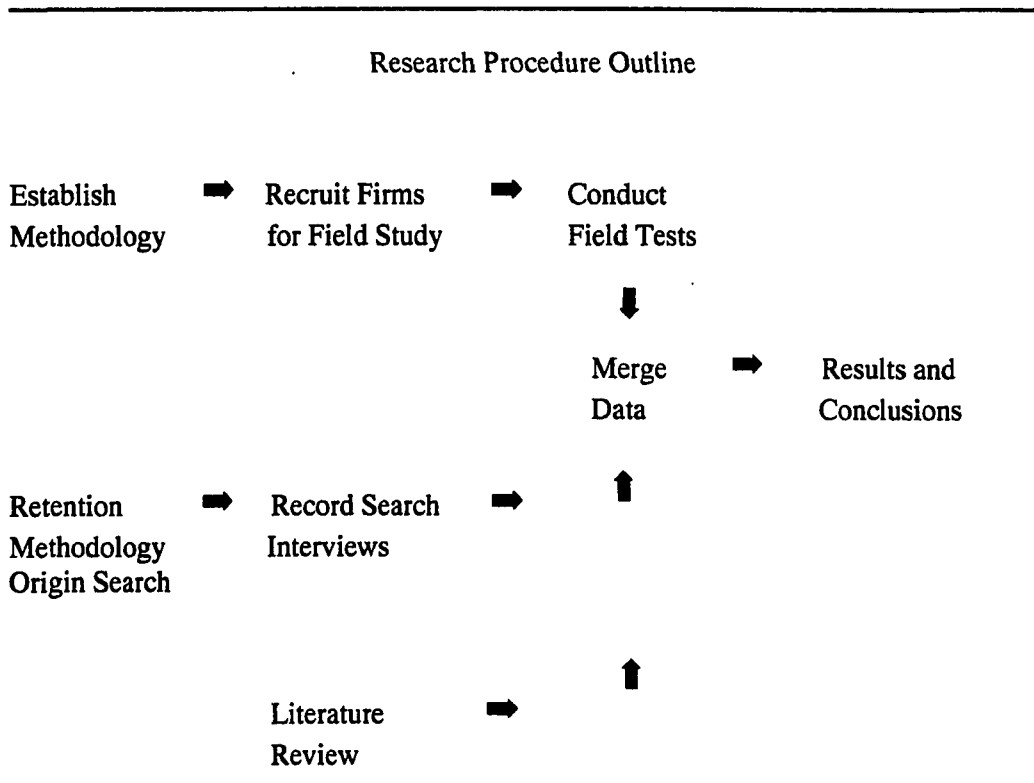


Figure 6. Outline of Research Design

Sawtooth Technique Construction

Using my background knowledge of the retention change strategy, lessons learned from successful organization changes (see Figure 4), the naval reserve failure and the more recent experience with the government laboratory, I structured a change initiation methodology for use with this research. Although it closely resembled the government laboratory strategy in structure, it was more participative in nature and each step of the process was more clearly

defined (in writing). The detailed descriptions of each step of the Sawtooth Technique are included in Chapter IV. This more defined structure was required to give the participating organizations a clear view of steps to be accomplished.

Sites for Data Collection

The study was conducted almost entirely in the metropolitan area of the city of San Diego, CA. Limited discussions were held with U.S. Navy officials in Washington, DC, and Norfolk, VA, regarding their Total Quality Leadership implementation efforts during 1992 and to gather potential survey questions during 1993. Located in San Diego were the only historical records of the retention improvement methodology, the Navy Personnel Research and Development Center (source of considerable survey construction materials utilized), and both key individuals interviewed to define the origins of that strategy. The two firms who tested the Sawtooth Technique were also located there.

In order that these initial tests of the Sawtooth Technique could concentrate on the examination of the specific steps of the technique, organization candidates for participation were carefully reviewed for evidences that they possessed knowledgeable leaders, a commitment to achieving meaningful changes and a readiness to proceed in a timely fashion. Although four organizations were identified as potential participants, two were not able to make a commitment that indicated a readiness to implement identified changes. Since a poor change effort might cause damage to the organization or to included individuals, these organizations were eliminated from consideration. (Both were public sector organizations.) The period of selection covered almost six months because of the needed discussions with specific leaders and the necessity of acquiring corporate approval by the two actual participants.

To protect the confidentiality of the data collected during the field implementation tests of the Sawtooth Technique, I have selected fictitious names for the firm participants that distinguish them as to their relative size: SmallFirm and LargeFirm. SmallFirm is a small field office of a large, world-wide corporation. The corporation is composed of over 6000 professionals and provides a variety of consulting services internationally. The San Diego office was composed of the leader and ten other employees. LargeFirm is a division of a Fortune 100 company that boasts over 43,000 personnel on six continents. Services offered by this division included facility management, systems and software development, and engineering services. The local office included one hundred employees and its leader at the time this research began. During the actual collection of survey data during the execution of the Sawtooth Technique, data was collected at the main office spaces of both firms and at the client work site for LargeFirm.

Libraries were a source of some material regarding the theoretical origins of the Sawtooth Technique, but much of the specific information was drawn from my personal files that covered the period from 1981-83. The Navy Personnel Research and Development Center provided historical information regarding the Navy's human resource management programs that included a study of their survey instruments (see Sacar, 1976).

Participants in the Research

The largest number of participants in the study were the employees of the two companies who participated in the field study portion. The leaders of the two organizations were very helpful in providing access to their physical facilities, freeing individuals to assist in data collection and coordinating Sawtooth Technique supporting events.

Two individuals, Mr. Roger P. Thompson and Mr. Othan N. (Nate) Mondy, provided

personal background information as to the development of the original retention improvement technique and its organization development roots. Additional archival and library assistance was provided by a variety of researchers at the Navy Personnel Research and Development Center, the Department of Defense and the Library of Congress.

Sources of Data

Data were collected from personal observations, interviews, conversations, examination of personal files, attendance at meetings and surveys. Two types of data were collected: data related to the overall purpose of this study and that related specifically to the Sawtooth Technique field tests. Research regarding the origins of the Sawtooth Technique and the field tests of it were conducted in parallel (simultaneously) since they were independent of each other during the data gathering portion of the study.

In establishing the origins of the retention improvement strategy, interviews with two retired U.S. Navy master chief petty officers, Roger Thompson and Nate Mondy, were critical in developing insights as to why the model worked in practice and in connecting it to research known by them at the time of its inception. (Those two gentlemen had been present during the iterative development of the first retention improvement strategy.) My personal files provided information that included retention statistics, relevant management articles of the period (late 1970s to early 1980s), and reports of several retention improvement efforts.

The Navy Personnel Research and Development Center provided significant materials related to surveys used in assessing organizations (Fumas, 1990; Sacar, 1976). Additionally, they invited me to attend several meetings of the leaders involved in the Navy's Total Quality Leadership Program implementation effort. Additional program implementation information

was provided by the staffs of the Chief of Naval Operations and the Assistant Secretary of the Navy in Washington, DC.

Data sources for the field tests of the Sawtooth Technique included the leaders and employees of two private sector firms. Data were collected through interviews, observations, conversations and surveys.

Data Gathering Methods

Two categories of data were collected during the field study, that pertinent to the organizational changes in progress and that specifically relevant to the overall purposes of this study. Although both were of value to the researcher in assessing the structure of the Sawtooth Technique, data collected specific to the issues of the organizations are not reported in great detail because of their sensitive and confidential nature (as noted by the organizational leaders). However, in Chapter IV the general aspects of that data, their potential uses by the participating organizations and relevance to the study are discussed.

Ethnographic aspects suggested by Spradley (1979) and Patton (1980) were used in designing both the overall study and specific portions of the change methodology. An interview guide (see Appendix A) was developed for use in interviewing the two organizational leaders and a separate one for the representative interview participants (see Appendix B). The structure for these interview guides was originally developed to support the methodology pilot field tests conducted at the government laboratory (Martin, 1991, 1992). Those guides had proven to be very effective in that effort so only minimal rewording to reflect private sector vocabulary was effected for this study. Care was taken with the interview guides to ensure that questions were generally of the grand tour variety to let the interviewees express their concerns without injecting researcher prejudices.

However, issues evolving from grand tour questions that might be of value to the organizational change process were then explored using the mini-tour variety (as per Spradley, 1979).

Qualitative data regarding the two firms (to be used as the basis for tailoring surveys) was largely obtained by using the two leaders and representative organizational members as informants. The data collected during this survey development process also provided information regarding the environment of the organizations that could be integrated with quantitative survey data collected later. Quantitative data collected by developed surveys was processed using SPSS/PC+, a social science statistical software package designed for a personal computer. Examples of the format of the processed data as provided to the subject firms is provided in Appendix F.

Surveys were used as an integral part of the change implementation process in both cases studied. The surveys themselves (see Appendices C and D) were constructed making use of a data base of questions compiled from a variety of sources (see below) and combined with some written specifically for the field study organizations. The survey question data base had been compiled by collecting listings of survey questions used by various social scientists and organizations to investigate organizational effectiveness. The value of using questions that had previously been used and analyzed in practice was in eliminating some potential wording problems while simultaneously accelerating the pace of survey construction. The most valuable sources for questions for this data base proved to be:

1. The Human Resources Management Survey (with separate forms designed for sea-based and shore-based Navy units) developed by the Navy Personnel Research and Development Center as reviewed by Sacar (1976). These surveys supported internal Navy

organizational effectiveness consulting for almost two decades (1970s and 1980s) and were most thoroughly reviewed and analyzed as to the validity of the questions as well as their interrelationships.

2. Department of Defense Total Quality Management self-assessment guide developed by Denslow (1991). This guide was reviewed and recommended prior to publication by a separate study of assessment documents completed by Fumas (1990).

3. The organizational assessment survey developed to support U.S. Navy Total Quality Leadership implementation efforts (Riemer, 1992).

4. The employee satisfaction survey to support a process action team effort at the U. S. Naval Hospital in San Diego, CA (Brodeur, 1993).

Specific questions selected for use were the result of a participative interview and feedback process, which was a key part of the Sawtooth Technique. The ability to tailor surveys to a local environment and then quickly to process data was another important capability lending to methodology flexibility.

Those members of the organizations selected to participate in the survey design and initial organizational assessment process were chosen by me from lists provided by the firms that divided employees into groups that were representative of the organization. In the case of the small firm I was provided a list that included all employees. In the case of the larger firm, I was provided the names of individuals who represented major areas of the firm as noted during my interview with the local vice president. Because I had a contractual relationship unrelated to this study with that company, those persons with whom I might normally interact were excluded from the list. Since the number of those excluded from the interviewee selection process was small (five of one hundred total employees) and since

there was an adequate number of others available to represent needed areas of the organization in the survey development process, the exclusion of these individuals should have influenced neither the research effort nor the organizational change process. In both instances I was also provided information for those employees that noted whether their normal work was technical or administrative in nature and whether their usual work location was at the main office or at a customer site. Without knowing any of the specific individuals, I then selected names from the list while ensuring that the various organizational entities were represented to include such aspects as males versus females, technical versus administrative work performed or geographic work location.

Field Implementation

The field tests of the Sawtooth Technique began with interviews of the two organizational leaders on September 22, 1993, (small firm) and October 11, 1993, (large firm). This effectively started the change implementation process as well as the field study portion of the research. Approximately one week after interviewing the leaders, representative members of the two companies (those selected for the survey development effort) were interviewed. From the two sets of interviews within each business concern, questions were assembled for a survey, utilizing a Likert scale form of response.

Following the administration of the survey, I completed a preliminary analysis of the data. This analysis included a review of the mean scores and standard deviations for each survey question by demographic element. This mathematical summary was compared to information gathered during the survey development interviews to note specific similarities or differences. This preliminary information was then presented for comment in an open forum to all available members of each of the organizations. From the general sessions

certain conclusions were verified and others modified to reflect the additional information provided.

Following a further review of the data and conclusions with the two respective organizational leaders, the researcher turned over the collected information and retreated temporarily from the change process. This was to allow each of the organizations an opportunity to continue the process using entirely their own resources.

In February and March of 1994, I returned to each of the organizations to interview the leaders regarding events subsequent to the change beginning period. I was specifically looking for events that indicated that they were assisted by the technique in continuing organizational improvements and for any direct links to improved organizational performance. I also looked for any obvious indications that the culture of the firm might have begun a change process, particularly to one that reflected the participative nature of the Sawtooth Technique. In particular, the types of change indications for which I was looking included organizational structure changes that reflected multi-disciplinary employee advisory teams, increased energy directed by other-than-management personnel toward improving the work environment, aspects that might reflect greater individual or organizational productivity, and improved employee morale.

Methodology Origins

Because the interviews with those associated with the origins of the Navy methodology were not time critical, they were ultimately scheduled after the field tests were well underway in February 1994. Although the two gentlemen interviewed would have on the surface demonstrated strong blue-collar backgrounds, they also proved to have experienced some exceptional non-traditional education and training experiences that gave the strategy

close ties to established organization development techniques. My goal was to establish the backgrounds of the individuals, review the early days of the U. S. Navy methodology development, and then seek to establish some relationships between their approach and research reported in various literature.

The interviews were tape-recorded and were about two hours in duration. The interviews began with each gentleman being asked to provide general information as to his birth place, education and significant maturing experiences. They were then asked to trace their military backgrounds from the time they entered the U.S. Navy until they were assigned to the COMNAVAIRPAC Staff. When they reached that point in the interview, I asked them specific questions as to the sources of ideas for the retention improvement strategy, problems and successes with early efforts, lessons learned that impacted on changes in their strategy design and details as to the acceptance of the technique by participants. When I incorporated information from those interviews into this study, I worked from my written notes and the tape recordings of the interviews. (The tapes were reviewed only for content and were not transcribed.)

Threats to Study Reliability

When I assumed the role of participant observer during the field tests of the methodology, it was necessary to guard against several weaknesses noted by Patton (1990). There was a strong possibility that I could introduce my own biases in data collection and interpretation. In addition, my presence could influence the information provided by participants. To guard against influencing the final results, I used techniques both inside and outside the field research environment to assist in guarding against this problem. I used interview guides to assist in maintaining a disciplined structure for the Sawtooth Technique field test interview

discussions. Since the members of the two organizations observed were fully aware that I was both assisting the organization and studying the process, there was also the opportunity for that knowledge to have influenced their behavior. Since I used a combination of data collection techniques supplemented by established literature, historical interviews and actual practice, I feel that personal biases and relationships with subjects of the study were minimized as to their influence on the final results and conclusions of the study. As a final check of the process, the two organizational leaders were asked to review and suggest corrections to possible researcher misinterpretations.

Conclusion

My ultimate goal was to establish a methodology that could guide a change agent in leading an organization through a period of significant change(s). The descriptive nature of this study is not designed to evaluate the actual performance of the generalized methodology but rather to definitively discuss it in terms of a practical implementation initiation process as supported by well-accepted research of record. The integration of the literature search, methodology origins and field demonstrations is accomplished in Chapter IV.

This final integration is expected to provide the reader with an outline for action and the justifications for each of the recommended steps. Lessons learned are discussed as are the underlying assumptions of the researcher. This study should demonstrate a beginning triangulation of data that reflects established organizational and human behavioral research, an historical practical example of considerable success (the Navy retention improvement methodology) and a generalized strategy practiced in the present by two private sector organizations.

CHAPTER IV
THE SAWTOOTH TECHNIQUE

Introduction

The Sawtooth Technique has emerged as a change management methodology following years of practitioner-directed iterations. Possessing origins in the organization development research and practice of the 1960s and earlier, the technique discussed here in its earliest forms was first used to address problems of personnel retention in the United States Navy. It has since been adapted by this researcher to address more general aspects of organizational change, and it is this more general form that is described. However, it should be noted that for any specific application that might be repetitive in nature, such as with a very large organization, the technique should probably be specifically tailored to the task at hand as was the first successful Navy version.

A reader familiar with commonly used consultant techniques will notice that the steps described are frequently used by many management consultants. The key difference in this approach is the integration of organization members from the earliest steps in the organization change process. This is not a management-directed change methodology. It is a management-guided change methodology. Resistance to change is addressed in the earliest steps by attempting to develop a sense of ownership (and thus control) for all the organization's people.

This chapter will first discuss the specific origins of the methodology and then provide a detailed discussion of the technique's steps. Following the abstract discussion, two private

sector examples of its use will be outlined. The discussion of its origins includes information collected by interview from the individual who first developed the specific consultant approach and from another person who observed this technique in practice during its first field uses. This interview data was then merged with my own observations of the technique as I saw it in use in the Navy retention efforts during the period 1981 to 1983. To the structure that emerged from the above definitional research, I then added changes intended to form a more general methodology capable of addressing needed organizational changes in a wide range of public and private sector environments. These generalizations were then partially tested at a large government laboratory within a functional division that was undergoing significant changes during 1991 and 1992 (Martin 1991, 1992). With some final modifications the Sawtooth Technique was defined in the form that will be discussed herein.

Origins

Two individuals who were present during the first uses of a similar methodology were critical sources of information regarding the technique's early development. Roger Thompson and Nate Mondy were both U. S. Navy senior chief petty officers, later to retire as master chief petty officers, when I first met them. The information reported in this section is largely the result of personal interviews with those two gentlemen (R. P. Thompson and O.N. Mondy, personal communications, February 16, 1994).

Following his experience in implementing retention-oriented programs with the Navy, Roger Thompson has been awarded a bachelors degree in education and a masters degree in organizational development. He first became involved in the human resources management field in 1969. Most recently he was the Director of Technical Training for the manufacturing division of Rohr, Inc., a nationally known manufacturer based in Chula Vista, California.

Mr. Thompson was intimately involved in the development of the first retention models designed to address the changes in organizational structure underway in the mid-1970s. He was, in fact, the theoretician who established the initial architecture that evolved into the Navy-wide retention improvement program. Additionally, he was involved in the first field uses of this strategy and helped to revise the methodology as it evolved.

Nate Mondy, who recently retired as the Force Master Chief for the aviation forces within the United States Pacific Fleet, was one of the first Navy enlisted personnel trained to conduct organization development style consulting interventions in Navy units. Supported by the Navy Personnel Research and Development Center, which maintained a comprehensive data base, these early consultants performed organizational improvement functions similar to private sector consultants. Data collected during a unit diagnostic period was fed back to unit commanding officers, who then were provided assistance in effecting improvements in their organizations. This work was also closely related to the quality of work life (QWL) initiatives being tested in many United States organizations as many of the diagnostic questions related to QWL issues. Interestingly, his initial training included sessions with such well-known behavioral experts as Warren Bennis, B. F. Skinner and Carl Rogers. Mr. Mondy is currently the president of a marketing firm located in El Cajon, California, specializing in assisting small and minority businesses to market products to the national military retail market.

In 1970 Mr. Thompson was participating in the Navy's program designed to address race relations issues. As the end result of a strong personal disagreement with the program aspects as they were being practiced with the active Navy forces, he wrote a letter directly to the Chief of Naval Operations, then Admiral Elmo Zumwalt, complaining of the lack of

effectiveness. At that time race relations issues being addressed were normally met in a confrontational manner, "you're wrong and I'm right." Although initially relieved of his immediate duties and placed in a disciplinary status, he was eventually called directly to Washington, D. C., and then sent to work with Curber Associates International, where he participated in the development of a new strategy for improving race relations in the military.

One of the initiatives of that day was the attempt to develop measures of the work environment, the first being known as Equal Opportunity Quality Indexes (EOQIs). These indices measured the cultural climate in a very broad manner without a focus on specific issues. It was a rather bureaucratic way of assessing a broad range of climatic indicators without providing much of value to a specific military unit commander. It was a first attempt at monitoring the environment statistically but seemed to fall well short of what would now be termed benchmarking.

Mr. Thompson's next fleet assignment was to a small combatant ship, a destroyer escort named the Davison. On board that ship he assumed the leadership of a poorly performing enlisted personnel retention program which was surrounded by an environment filled with disciplinary problems, substance abuse and other negative factors. With the assistance of the ship's executive officer, the person second in command of the vessel, and without the commanding officer's active participation, Mr. Thompson began to focus on internal issues such as berthing, food service and leadership, improving basic quality of life issues as a means to improve the retention of those whose Navy contractual service was approaching an end.

Changes effected were first focused on the chief petty officer community, those charged with front line supervision of the ship's work. As working conditions improved, there

developed a similar improvement in the retention of enlisted personnel. Within a relatively short period of time an organization with a very poor working environment was changed to an award-winning retention command.

Successes at that command led to an assignment ashore at the Subic Bay Naval Station in the Philippine Islands. There shortcomings in the retention program revolved around a lack of knowledge and skills belonging to those charged with guiding the retention program. (This, it should be noted, is one of the key issues raised within Edwards Deming's (1986) philosophy--that people of an organization cannot be expected to perform well if they are not properly trained to perform their assigned work functions.) Combined with provisions for better informing and serving potential reenlistment candidates, this emphasis on training for career counselors led to significant improvements in the local retention efforts.

Mr. Thompson also began looking within various commands and their subdivisions for any correlation between retention results and factors such as the number of identified racial problems, discipline cases and the like. These indicators of the quality of the work environment were found to have a direct effect upon the willingness of individuals to stay within the United States Navy for additional tours of duty.

These successes did not go unnoticed. The Commander in Chief of the United States Pacific Fleet, Admiral Hayward (who was later to become the Chief of Naval Operations), began looking for one of his immediate subordinate commanders who was willing to try these innovative concepts on a large-scale basis. Having identified the Pacific aviation forces as a trial organizational division, he arranged the transfer of Mr. Thompson to that organization where he was to serve on the staff of the Commander Naval Air Force, U. S. Pacific Fleet, known by the acronym COMNAVAIRPAC.

It was the COMNAVAIRPAC team of which Mr. Thompson was a member that ultimately developed the structure of program implementation that provided the major ideas for the Sawtooth Technique. They chose to provide assistance only where senior members were aware of the significance of their retention problems and were committed to solving them. Initially, it was also necessary to drive the fear of official sanctions from the minds of participants in positions of responsibility. This also was consistent with the thoughts expressed by Deming (1986). With the gradual achievement of an environment more accepting of the need for change, the team began to use survey instruments routinely to diagnose the key problems that showed a direct correlation with retention issues. This allowed a focused effort to build a healthy and productive environment which also contained the key ingredients to support a retention program.

Initial efforts appeared to be most accepted in aviation communities where teamwork was emphasized in their routine military activities. The first surveys proved to be too long and also came under criticism for being negative in approach. With time the surveys were both shortened and given a more neutral position. Appendix E provides a copy of the final version of this survey as included in Thompson, Scrimsher and Martin (1981). (This survey was later adopted by the master U.S. Navy retention program and used to support the efforts as outlined in the U. S. Navy Retention Team Manual.) They were also focused more completely on the issues that showed particularly clear relationships to retention issues. Many of the techniques incorporated into these efforts reflected Mr. Thompson's familiarity with such publications as Psychology Today, Harvard Business Review and The Journal of Applied Behavioral Science as well as his training experiences with the Department of Defense Race Relations Institute.

Mr. Mondy joined the COMNAVAIRPAC staff team after several fleet unit assignments and unusually extensive human behavioral training and experiences. His training for fleet consulting work at the Human Resources Management Center in San Diego, California, included much work in group dynamics and facilitation skills at schools such as the University of California at Los Angeles, Stanford and the Massachusetts Institute of Technology. Specifically assigned as the COMNAVAIRPAC Staff Minority Affairs Advisor, he successfully argued that his position should become a part of the team that addressed all human resources issues with the Personnel Department. This placed him in the same administrative entity with those who were focused on improving the work environment to improve enlisted retention as well as address environmental problems such as substance abuse and the integration of women and ethnic minorities into the mainstream of U. S. Navy opportunities.

He was a strong supporter of the use of data-based assessments as a starting point for unit improvements. He found initially that military units often measured their success in terms of the readiness of their military hardware while tending to neglect the human aspects of the performance equation. Senior leaders tended to ignore the value of demographic information and often lacked critical analyzation skills. Often missing were the most basic competencies for solving complex problems such as establishing measures of performance at the beginning or finish of periods of planned changes. Commanders rarely looked at their environments as complete systems and tended to overlook underlying issues.

Working together with additional members of the staff, a basic guiding philosophy for retention improvement emerged. Included were the following key aspects:

1. The consultants must have been invited to the organization which required assistance.

(This indicated that the organization's leaders recognized that there was a significant problem--crisis recognition--and were willing to support a change process necessary to address relevant issues.)

2. The senior organizational leader must have understood in advance the overall retention improvement process and must have indicated a sense of trust in the consultants' capabilities.
3. The senior leader must have expressed confidence in the diagnostic and feedback processes as well as providing legitimacy for their use within the organization.
4. The diagnostic information was to be presented in a manner designed to maintain the confidentiality of respondents.
5. Problem-solving teams chosen to address identified problems must have reflected an appropriate representation of organizational members, such as cross-functional skills, leadership, or special knowledge.
6. The consultant team members must fully understand their own roles.

Personal Observations

I joined the COMNAVAIRPAC retention team after serving as member of an aviation squadron at a time when the basic organizational intervention strategy had already become fairly well-defined. I observed the team in action working with organizations as large as 5000 members that included many subdivisions and single units of as few as 200 members. The environments varied as to assigned mission, geographic location, physical resources, and many other factors. The success of organizational development efforts was measured with retention statistics obtained before and after the changes were effected. Organizations often began to show observable improvements within three months and almost always by the end of six months (Martin, 1981-83).

With the assistance of the COMNAVAIRPAC staff retention (organization improvement) team it was not unusual to see rather dramatic reversals in unit retention performance. The most dramatic improvements occurred among those individuals who were making their first reenlistment decisions after four to six years of enlisted military service. Retention rates of those personnel before the organizational improvements were most often in the area of 15-20 percent choosing to serve another period of enlistment. Average rates following the implementation of unit improvements were almost always over 40 percent with some commands exceeding 50 percent (Martin, 1981-83). These retention climate measures were almost always accompanied by reductions in disciplinary problems and ethnic confrontations as well as improvements in unit operational performance. It should also be noted that those units undergoing these changes were not given any special or new physical resources to accomplish retention improvements (although they routinely received training that improved their administrative support for retention efforts and their ability to use multi-disciplinary teams for problem solving).

One of the most startling turnarounds I observed occurred when the team was invited to assist in improving retention efforts in another general command, a training wing assigned to the Aviation Training Command located in Corpus Christi, Texas. Removed from the influences of the Pacific Fleet environment, the wing in question was the worst of six wings in the area of retention at the time of the invitation. A team of five COMNAVAIRPAC Staff retention specialists (including myself) flew to Corpus Christi where they spent one week providing the full range of retention program improvement services. The week of development activities included as its key points the following steps:

1. An initial orientation for senior members of the command to ensure that they were

aware of the wing commander's support for the effort and understood the entire process for effecting retention improvements.

2. The administration of a standard retention survey to enlisted personnel that represented over a 60% sample of those assigned.

3. The compilation of raw statistical results of the survey and the feedback of those results to command supervisors.

4. Assistance in interpreting the survey's results and in the formation of multi-disciplinary problem-solving teams.

5. Training of key personnel in skill areas related to the retention process. (Martin, 1982)

Following that single week of assistance the COMNAVAIRPAC assistance team returned to San Diego and provided no further direct contact help. Limited telephone advice did supplement the visit. At the end of six months the wing retention results had improved so dramatically that they had become the top retaining organization of the six aviation wings. Although we of the COMNAVAIRPAC team had expected to see significant improvements, the magnitude of the change surprised even us. It was at this time that I began to understand fully the potential merit of the process for changing organizations to address other than retention issues.

A second application also added to my understanding of the dynamics of the retention improvement process. At the end of my assigned tour with the COMNAVAIRPAC Staff, I chose to leave active military service but remained associated with the U.S. Naval Reserve. When my background in the retention area was brought to the attention of the senior officer in charge of the aviation reserve center of which I was a member, I was asked to assist in applying the COMNAVAIRPAC methodologies to the local reserve wing. At that time they

were the poorest retaining aviation reserve wing of the seventeen wings in the U. S. Naval Reserve (nation-wide).

Although I used a process that was almost identical to that which I had seen work so effectively with the active naval forces (modified only to reflect organizational differences), the efforts for improving their retention were almost a total failure. There was an initial improvement noted in retention statistics when the improvement effort first began, but the results soon returned to that which left them as the worst of all reserve elements in the retention area. An analysis of that effort led me to believe that the wing commander did not understand the overall process and attempted to bypass several aspects. As a result, representative teams to solve problems were never formed, key retention program personnel changed several times on short notice and no significant training was ever conducted. The transitory improvement was most likely similar to the Hawthorne Effect noted by Roethlisberger and Dickson (1939) rather than any improvements in the organization.

One very important observation to me was the great amount of energy exhibited by the people of an organization when the survey was administered and the results discussed. This was again, to some degree at least, an example of the Hawthorne Effect in practice, people feeling energized because their organization was showing interest and concern for them. It was at this time that I began to consider ways in which this energy could be incorporated more directly into accomplishing the improvements that might be needed in an organization undergoing significant changes.

Almost ten years later during the years 1991-92, I was called upon to assist several leaders at a government engineering laboratory in implementing significant organizational changes. Seizing upon this situation as an opportunity for using a modified version of the Navy

retention improvement strategy to establish the organization's climate so as to guide appropriate changes, I designed a more general version of the methodology that expanded the participation of individuals in the information collection and analysis aspects. The methodology was divided into two stages: a first stage using qualitative (interview and personal observation) techniques to develop a listing of key issues that appeared important to the organization and a second phase that developed quantitative information with the use of a survey instrument to further define issues identified during the first phase.

As reported by Martin (1991) the qualitative phase included interviews with the division head (organizational leader) and eight representative members of his division. The interviewees were selected so as to be representative of the various work (administrative support, technical, etc.) and other demographic (age, sex, etc.) aspects of the division. Following the collection of interview information, I designed a survey that included questions that were designed to be answered using a Likert-scale response as to degree or on a YES-NO basis. The survey was reviewed by the division leader and summary information from the interviews was discussed with him.

During the quantitative phase (Martin, 1992) the survey was administered to all those division members available on the date selected by the division leader. A preliminary analysis of the data was prepared and presented to all those division members available to attend the session. A question-by-question review was completed. The session was very lively and interactive with considerable verification of survey data possible and several new insights gained to refine and focus a final analysis.

Both phases were documented by informal written reports to the organization leader (Martin, 1991, 1992) for his use in planning and prioritizing division changes. (His overall

preparation for directing changes within this entity, however, were nullified when a reorganization changed the overall structure of his department, and he was reassigned to a staff position.) However, again the interest and energy of the people of the organization itself were evident during the use of survey materials to guide change, particularly during the preliminary data analysis general session. This led me to begin a search for a manner by which to incorporate aspects of participative management into the change process that would use the energy developed by this process as an "engine" for change. It also appeared that an early involvement of people undergoing change in influencing those changes would assist

Origins of the Sawtooth Technique

Related Influence	Methodology	Key Additions
Organization Development Human Behavioral Research	NAVY RETENTION MODEL	Use of Surveys Cross-Functional Teams Ownership of Changes
Hawthorne Effect	NAVY RESERVE APPLICATION	Energy for Change Reduced Resistance Feedback Leadership Effects
Computer Technology (Personal Computers)	GOVERNMENT LABORATORY APPLICATION	Participatory Process Need for Timeliness Need for Consultant Guide

THE SAWTOOTH TECHNIQUE

Figure 7. Outline of the Sawtooth Technique Origins

in reducing resistance to change, increase post-change ownership of new processes and lead

to much more rapid organizational character changes. From this intermediate methodology tested at the government laboratory emerged the basic structure of a more general and flexible tool than its Navy retention improvement ancestor. As noted earlier, for the purposes of this study it has been named the Sawtooth Technique. The development of the technique is summarized in Figure 7.

The Sawtooth Technique Described

The Sawtooth Technique is a generalized organization intervention technique that is tailored for each specific user. It is consultant dependent in most cases because of the specific skills required to guide the process. During the early development and testing stages of the technique, it appeared that a methodology could be designed which could be used by most organizations with the assistance of internal resources (personnel) only. However, during field tests of the first versions it became increasingly apparent that interviewing skills and survey development knowledge were critically important to the process. Additionally, a broad understanding of many different kinds of organizations, their strengths, weaknesses and other implications was, likewise, needed to structure questions and guide assessment design. These aspects along with the advantages offered by a neutral party to facilitate communication under sometimes difficult situations led to the conclusion that change guided by professional consultants using this strategy would provide the best and most consistent results.

The Sawtooth Technique is best used as a bridge between a strategic visioning process and the establishment of a process implementing planned organizational changes. The technique is a methodology designed to accelerate change in its early stages within an organization but cannot stand by itself as an end in itself. Part of the diagnostic process will

likely raise the expectations of organizational personnel that changes will occur as the natural outcome of the process. Should those expectations not be met within a "reasonable" time period, it might well be expected that the organizational leadership will find considerable skepticism and increased resistance to change as a result.

The general steps for an organizational intervention using this technique would be employed in the following order:

* **STRATEGIC PLANNING.** A period of strategic planning and visioning involving the senior leaders of the organization would outline the general directions for the desired changes. This would provide key leaders with an orientation toward the future but without defining specific means for achieving the relevant goals and objectives. (This is an intentional departure from many current strategic planning processes that lead to the development of a well-defined action plan with objectives and achievement methods completed. That must come later.) During this session it would be decided that the use of the Sawtooth Technique could be used to support the needed changes. Support from the senior leader is critical to success as is that of the leaders of specific entities who will utilize it.

* **THE SAWTOOTH TECHNIQUE.** When the organization leaders have agreed upon the general course of change, the Sawtooth Technique can be employed. (See Figure 8 for a summary of the steps described.) It consists of the following steps:

o Leader Interview. The leader of a unit designated for the use of this methodology, whether it be the entire organization or a subdivision thereof, is interviewed by the consultant. The discussions are designed to ascertain the leader's vision for the organizational entity of his/her responsibility. Also, the consultant should seek to identify

the leader's beliefs regarding the key issues facing the organization and its people. (The questions should be broadly stated by the consultant to promote the leader's input without consultant prejudices.) In concert with the leader the consultant selects a representative sample of employees to interview in beginning the diagnostic survey process. Although the consultant should be free to select the specific individuals to be interviewed, the leader must provide his/her assistance in recognizing the key groups that should be represented during this employee interview phase. (A Leader Interview will probably last about two hours.)

- o First Consultant Review. The consultant reviews the contents of the Leader Interview to structure a general interview format for employee interviews. The interview structure should provide the opportunity to verify or disprove prospective issues noted by the leader during that interview. The opportunity to identify new issues should be given to the interviewees.

- o Representative Employee Interviews. The employees selected to participate in these interviews will subsequently assist the consultant in structuring the demographics of the survey as well as verifying the validity of the survey questions. The interviews will normally include six to eight employees although small organizational entities (10-15 personnel) may not require as many. The questions should provide an opportunity to identify key organizational issues that can then be addressed by a quantitative survey. (The interviews will generally be of a duration of approximately one hour.)

Although it might seem easier with a small organization to interview the entire staff, that is probably unnecessary to identify most key issues. Interviews must be conducted individually, and the sources of information guarded. Since the methodology is designed to build participation into the diagnostic process, quantitative data collection would still be

required since survey construction by the interviewees with the leader is an important team-building and participative activity. Triangulation of quantitative and qualitative data should provide more than adequate means to identify organizational issues. The extra interviews would add little value to this process and would raise the cost to the subject organization as to consultant and employee hours committed.

- o Second Consultant Review. The consultant conducts a preliminary analysis of the interview data (to include both leader and employee data) and selects questions for a survey intended for all organizational entity employees. A short analytical summary should be prepared to present at the survey validation meeting with the leader and employees.

- o Survey Validation Meeting. The consultant meets with the leader and employees who participated in the interview sessions. The preliminary analysis is presented by the consultant to all present and the draft survey is presented for review by all concerned. The leader-employee group assists the consultant in selecting the organizational demographics to be used in completing the quantitative analysis of the survey data (e.g., male versus female, technical versus non-technical positions, etc.).

- o Third Consultant Review. The consultant prepares the final survey form and reviews the interview and meeting data for any additional information of value.

- o Survey Administration. The survey is administered to as large a sample of employees as is available, ideally within a very small time frame (the same day). The survey should be relatively short (10-15 minutes to complete) and should include at least two questions that give employees an opportunity to raise new issues, the good and the bad.

- o Consultant Preliminary Survey Data Analysis. The consultant then conducts a preliminary analysis of the survey data. This data is then prepared in a format that will allow

the consultant to present this information to all the assembled members of the organization.

- o Consultant Leader Briefing. The consultant briefs the leader in advance of the results of the preliminary data analysis. This should be scheduled to take place just before (the same day as) the analysis is presented to the assembled organization.

- o Presentation of the Preliminary Survey Data Analysis. Before the assembled employees and organizational leader the consultant presents the preliminary analysis of the survey data. The purpose of the meeting is to seek the validation of conclusions drawn and to clarify the results of questions that are not readily apparent from the data. In the case of small organizational entities, this discussion may be a detailed discussion of each question and the related results. In the case of a larger group (perhaps greater than fifteen personnel) the discussions may focus at a higher level of analysis, *e.g.* general trends of responses, because of the greater quantity of data available and the larger number of individuals participating in the discussions. This recognizes the cost of time for large assemblages and the greater complexity of the organization. The interaction of the leader, consultant and employees is critical in building momentum for beginning the change process.

- o Fourth Consultant Review. The consultant reviews results of the general meeting and integrates that information with the preliminary analysis. Additional conclusions are merged with the preliminary analysis and then presented to the organizational leader.

- o Leader Briefing. The consultant provides the leader of the organization with a final analysis of the information collected during the leader and employee interviews as merged with the quantitative data collected during the survey.

At this point the Sawtooth Technique is officially complete. Its goal is to use the members of the organization (to include the leader and all available employees) to begin the

change process so that all understand the challenges faced, the issues identified and the general direction for organizational movement. The methodology is further designed to open communications between all subgroups of the organization and all levels of management. The hope is that the organization is now ready for change and prepared to effect it. Again, Figure 8 summarizes the steps considered to be part of the Sawtooth Technique in initiating and accelerating a change effort.

* **CHANGE IMPLEMENTATION.** Under the direction of established line management, action teams are formed to address the needed changes. These multi-disciplinary teams include the necessary organizational talents to explore, evaluate and recommend solutions without limitations as to their regularly assigned organizational roles. (As an example, a team charged with reviewing the organization's reward system might include a senior manager, a financial analyst from the human resources group, a supervisor from engineering design, an assembler from manufacturing and a clerk from the loading dock. The staffing of these teams is expected to provide both the talent to develop solutions and the representation of a wide number of interests. The participation of a broad range of individuals also remains a key aspect of this part of the change process.) With the preparation of the organization for change by the Sawtooth Technique the opportunity is presented to make substantial changes while involving representative members of the organization in those changes. This presents an opportunity for subordinate empowerment as well as building participative management into the routine operational functions of the organization. The insertion of various management or change structures is very possible at

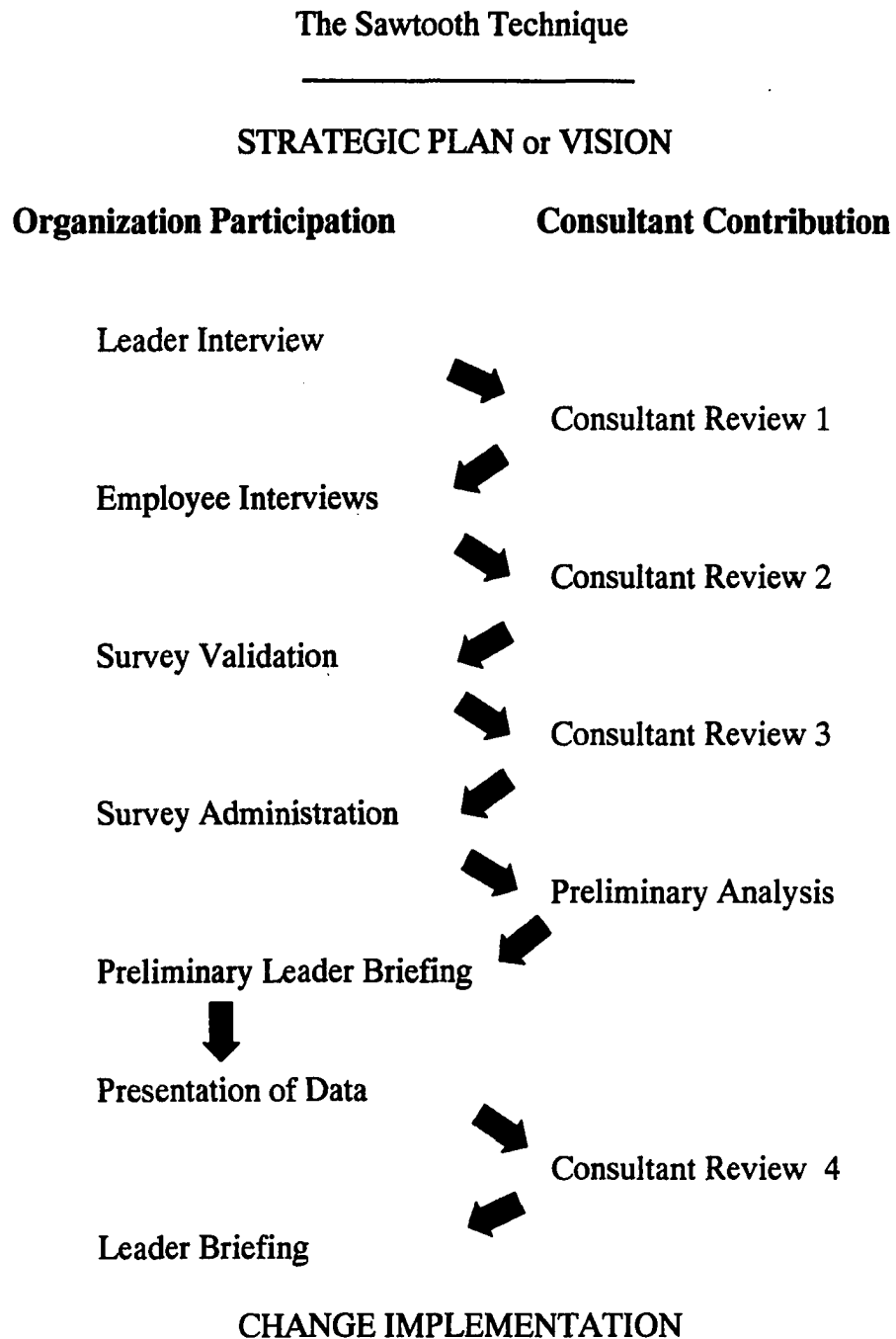


Figure 8. Outline of the Sawtooth Technique.

this time also, to include such programs as Total Quality Management with its included Executive Steering Committees/Groups, Quality Management Boards and Process Action Teams.

Other Considerations

There are several critical factors that must be considered when utilizing the Sawtooth Technique. The most important include:

* **TIMING.** Once the process begins, it must proceed in a timely fashion. No more than a few weeks should pass between the employee interviews and the administration of the survey, and probably no more time than that should separate the survey completion from the general review session. This indicates a need for scheduling the entire process in advance of the first steps while ensuring that the resources are in place to support the effort (availability of personnel, rooms capable of supporting the briefings, etc.).

* **LEADER SUPPORT.** Without the full support and understanding of the organizational leader, managerial behaviors may send signals to the employees that the entire process is merely manipulative in nature, perhaps another management game to push productivity at the expense of the employees. The leader must "walk the talk" and demonstrate a sincerity of involvement that encourages the same from subordinates. This is consistent with the findings of Sacar (1976) who concluded that the Navy's standard human resource management survey was most sensitive to variations in leadership behaviors, which appeared to influence substantially the perceptions of survey respondents.

* **COMMITMENT.** There must also be a commitment to finish the process once begun. Should expectations be raised for participation (as the process is designed to do) without the related opportunity for participation, the employees will be sent a very strong signal that

organization management is not serious about changing anything. Resistance to change may well rise to levels higher than would have existed before the Sawtooth Technique was begun.

* **CONSULTANT PARTICIPATION.** Continued consultant participation may well be required after the initial diagnostic period has been completed. Once the organization has accepted the consultant as a neutral party to facilitate change, that position may be of considerable value during the following period of actual change. This may well help to prevent "blind spots" from developing and in identifying areas where training may assist in building an internal change capability. Other assistance, as noted by Schein (1987), might include providing information, analyzing information by sophisticated means, helping diagnose complex problems or acting as an alternate channel for information or directive flows.

Field Tests of the Sawtooth Technique:

Two Examples

Once the methodology had been defined, field tests were arranged with two San Diego private sector businesses to verify the steps. Since the Sawtooth Technique was designed to be used in conjunction with an organization that possessed a strategic sense of direction (vision), it was important that participants have already established some sense of direction for the future.

Since competent leadership appeared to be such an important factor to the success of organization change in practice, the first major field tests of the technique were conducted within firms where the senior leader fully understood the concepts to be addressed. This included a commitment to a change process that would continue after the initiating Sawtooth Technique had been employed. By ensuring the environment had been properly prepared

in advance and would be reasonably favorable for a field test, assessment of the general success of the technique steps in achieving a reduced resistance to organizational change would be possible. Selecting a less favorable environment, on the other hand, would have made it very difficult to separate any benefits or failures resulting from the practice of the technique from those that would have occurred within the original organization before any changes were attempted.

It is important to note that the research was not designed to assess accurately the value of this technique but rather to develop a defined technique worthy of further evaluation. By reducing the number of key variables at the outset, it was easier to look for mechanical issues within the methodology that could be improved before more extensive and exacting research could be applied to a general evaluation.

After about six months of reviewing San Diego organizations for those which met the criteria (of leadership, commitment and organizational readiness) discussed in Chapter III in this study, two private sector firms were identified as appropriate candidates. (Two other organizations within the public sector were identified as interested in the process, but their leaders were not ready to commit to the process within the time frame of this study.)

Since the predecessors of this technique were most dramatically employed within large organizations (200 plus members), it was initially planned to use that size of organization for this study. However, the review of candidates did not reveal any local organizations of that size ready for this study. Instead, two smaller organizations were selected, one of 100 personnel at the outset and the other of particularly small size at 11 personnel.

Initially, I felt that the smaller firm would not provide much data of interest, but I chose to continue the study with a slightly different view in mind--a comparison of the technique

as used in a small firm and as used in a large firm. In fact, the differences as reported hereafter did indeed present some very valuable comparisons and did, ultimately, offer a potential alternate use for the Sawtooth Technique.

Because the two firms possessed many of the same qualities entering the study, I have designated them by two fictitious names that distinguish them as to size: SmallFirm and LargeFirm. Since the specific data collected during the use of the methodology could be considered very confidential for competitive business reasons, it will not be reported except in a very general sense. The focus of this research will be upon the process and its impact, lessons learned and issues of importance. Only the potential uses of types of data collected will be discussed.

The research will be first reported by firm, the steps described as executed with descriptive explanations as appropriate. Following these descriptive reports, some general issues will be noted and then further discussed in Chapter V.

SmallFirm

SmallFirm is a small, field office of a large, world-wide corporation. The corporation boasts over 6000 professionals on staff and provides consulting services in such widely diverse fields as defense, transportation, communications and environment. Having first opened its doors early in this century, the corporation has maintained a superior consulting reputation built around a philosophy of client service and partnership.

The SmallFirm office participating team included the leader and ten employees. (Although other corporate members occupied space at the same location, they did not join in the exercise of the Sawtooth Technique.) Those participating were part of a team whose main client was a large federal government laboratory. Services provided that client were

mostly of a technical, computer-related variety. Client services were usually provided at the laboratory location with administrative support available at the SmallFirm main office location (about 15 minutes away by automobile).

The office had recently (within the past 60 days) undergone a change in primary leadership. The new leader had been asked to begin an effort to grow the local organization into new markets that had traditionally not been served by the SmallFirm team. This was to be accomplished without affecting the excellent working relationship with existing clients and in the face of a somewhat weak economic situation in the state of California and dramatic downsizing efforts underway in the federal government.

Initially, SmallFirm had not been selected to participate in this research for two reasons: the lack of appropriate leadership and the size of the organization. The new leader, however, had agreed to participate with the team under his direction at his previous firm and felt that the new situation was even more appropriate for an exercise of this type. After discussing his perceptions of the situation which he was inheriting, I agreed that it would be mutually beneficial to implement needed changes using the Sawtooth Technique. I felt that I would then be able to compare the procedures as used with small numbers of people with those used with a larger firm. As noted later, this did indeed provide some very interesting additional insights.

SmallFirm and the Sawtooth Technique

STRATEGIC PLANNING. It was apparent that strategic planning at the corporate level had been the cause of the recent change in leadership at the SmallFirm office. The new leader had a broad sense of vision to guide his initial efforts but had been given considerable latitude to pursue new markets that he could identify as being beneficial to the local office.

Several discussions held with the leader before beginning the exercise made me feel confident that the local organization could proceed toward the envisioned future once the Sawtooth Technique was commenced.

THE SAWTOOTH TECHNIQUE. The research exercise began officially on September 22, 1993, and followed the following schedule:

- * Leader Interview September 22
- * Employee Interviews October 4
- * Survey Validation October 11
- * Survey Administration October 15
- * First Leader Briefing October 29
- * Presentation of Data October 29
- * Final Leader Briefing November 9

Total Days for Sawtooth Technique execution: 48.

The Leader Interview.

The leader of SmallFirm was an experienced businessman with a significant number of years working in the consulting and technical areas favored by the firm. He had previously served with this organization in another position before accepting work with his prior employer. Holding a doctoral degree in the field of political science and serving as a Naval Reserve officer provided him with additional insights in directing an organizational entity such as SmallFirm. I felt comfortable from the outset that he would be able to use the benefits of the Sawtooth Technique in effecting changes to his organization as they were identified.

The leader interview lasted approximately two and one-half hours and was interrupted

once in the middle because of an urgent telephone call. An interview guide was used (see Appendix A) to ensure that appropriate information and materials were collected and a broad view of the organization and leader goals were obtained. (Since the same interview guide was used during the other change implementation exercise, consistency was provided between the two research efforts.) By obtaining the leader's views regarding perceived problems, information was available in advance of employee interviews to guide those interviews in verifying or discounting the leader's views.

When the basic interview was completed, I was given a complete list of employees that were going to be participating under the leader's direction. Of those ten individuals I selected four for personal interviews. They represented individuals who were male and female, completed most of their work at the main office or at the client location, and whose work was mostly technical, managerial or administrative in nature. Based upon the leader interview, these appeared to be the most appropriate demographic categories within which to analyze collected qualitative and quantitative information. It should be noted, however, that had the interviews identified other significant categories of employees that were not represented, additional interviews would have been scheduled. Such was not the case with either of the two examples described in this research. Because the SmallFirm staff was mostly junior in work experience, no attempt was made to represent seniority within the interviews.

The last task of this interview was to set a schedule for the accomplishment of the remainder of the Sawtooth Technique steps. Because many of the employees worked primarily at the client sites and away from the main office, scheduling around normal work requirements was a necessity. As was to prove true for the other firm discussed herein, it was important to protect the firm's working relationships with its major client organization

and to minimize the financial impact caused by removing employees from a status that allowed them to bill a client's project during normal work hours (rather than an administrative overhead account). (It is conceivable that under some circumstances the entire process could be scheduled within one normal work week or less without creating undue pressure on either the organization undergoing change or the consultant.)

First Consultant Review.

The leader interview indicated that the employee interviews needed to look closely at the team orientation of individuals, communications, and the adequacy of facilities. The leader painted a view of the employees that was to prove fairly accurate, and he again expressed a fairly clear vision for the future of the local office. He noted that he wanted to more firmly implant in his employees the culture of the corporation as a whole while indentifying a clearer definition of the organization structure that would guide the transition to the future state. He wished to develop a "big picture" view within the SmallFirm employees and lift their eyes above the immediate demands of their assigned technical work. A possible office relocation needed to be investigated with employees during the next interviews. He was also interested in identifying leaders among the employees, perceived inequities in salary or other personnel issues, the level of trust within the organization and the corporate enculturation of the staff. (Because of the need to maintain a confidentiality of the specific aspects of the interview, only general comments can be repeated here.)

Representative Employee Interviews.

Four employees were interviewed, two men and two women. These individuals had been selected as representative of key categories of SmallFirm employees. Although the leader of SmallFirm provided the list of employees available, the final selection of individuals was

left to the researcher. No attempt was made to establish a sample of appropriate size from which to generalize to the organization since the purpose of these interviews was to involve individuals in the construction of a climate survey. Although some of the information obtained was certainly representative of the organization as a whole, the climate assessment survey was to be the actual document used to provide an initial organizational diagnosis. Each interview lasted just under one hour and was guided by an interview guide (see Appendix B). There was a generally positive nature to the responses with a few notable exceptions. Although the stress level of the individuals interviewed was less than that anticipated by the leader, there were some important barriers to effective teamwork identified during the interviews. As might well be expected with a new organizational leader and a yet-to-be defined new organization structure, communications were thought to be erratic. There were a variety of questions as to office vision, new working relationships, new client relationships and corporate intentions relating to the SmallFirm leadership change.

Second Consultant Review.

The interviews indicated that most questions of the survey should probably center around the structure of the new organization and its implications for communications, performance, corporate directions and personal relationships. Key questions also addressed the technological aspects of SmallFirm and the physical settings. Suggested demographic categories for the sorting of survey data were developed.

The leader interview had indicated that the staff possessed a fairly junior experience level. Since the employee interviews indicated the same, questions 54 and 55 were formulated to check employees own estimates of the business skill strengths of the staff. Based on the nature of the responses, the leader would be able to request appropriate skill development

training from his corporate headquarters. Questions 29, 45, 46, 60 and 62 were selected from the researcher's data base of questions to expand information that would help to define aspects of a young, somewhat inexperienced staff. This example was expanded to cover other key issues noted by the leader and/or staff representatives in their interviews until a tailored survey instrument was formed.

Survey Validation Meeting.

A summary of the consultant's review was presented to the leader and the four employee interviewees in a common session. These preliminary results were largely accepted by the group, the draft survey was reviewed and the demographic categories of value to the office were established. I judged the mood of the individuals in attendance to be largely positive and was impressed with the interest demonstrated in the results. This session also presented the organizational leader with a forum for beginning to interact directly with employees regarding the issues noted. It should be noted that this may well be the first key step in the change implementation process, a time when the organization leader and other organization members first begin to agree upon the challenges to come.

Third Consultant Review.

From the results of the two sets of interviews and the previous meeting, a final climate survey document was prepared. It consisted of 63 questions with responses evaluated on a 5-point Likert scale, one question asking for the one thing the employee would like to change and one question asking for the most enjoyable aspect of SmallFirm. Four other questions provided demographic information:

- * Male or female;
- * Individual career intentions at SmallFirm;

- * Work location (main office or client site);
- * Whether work was mostly with federal or state projects.

When the survey instrument was completed, it was reviewed by one of the employees who had been previously interviewed. She checked the instrument to ensure that the wording properly referred to aspects of SmallFirm in an unambiguous manner. (Appendix C is a copy of the survey used during the SmallFirm Sawtooth Technique application.)

Survey Administration.

The survey was administered to all SmallFirm employees participating in the change efforts at the same time. The average completion time was 15 minutes with a minimum of 8 minutes and a maximum of 22. I personally gave the directions for the survey and presented some background information for the benefit of those who had not participated in the interview portion of the process. At this point all members of SmallFirm under the supervision of the office leader were participating in the Sawtooth Technique.

Consultant Preliminary Analysis.

Using SPSS/PC+, software designed for use with IBM-compatible personal computers, I computed the mean and standard deviation for each of the Likert-scaled questions. (Although I used a manual data entry technique, the data could have been entered using an optical reader to accelerate this step.) Because of the small number of respondents I also prepared a spreadsheet and individually reviewed the patterns of response for each question. The responses were also reviewed to see if there were significant differences in the patterns of response for the different demographic groups. For the two unstructured questions, I simply listed the individual responses and then reviewed them in light of responses to related questions in the quantitative portion of the survey.

Consultant Leader Briefing.

The preliminary results were discussed with the SmallFirm leader in a private session preceding the general session. This meeting was designed to ensure that there would be no surprises during the following session and to make a preliminary verification of results to see if anything obvious to him had been overlooked.

Presentation of the Preliminary Survey Data Analysis.

Before all the participating employees of SmallFirm I presented a summary of the findings. Following a few fairly general statements regarding the overall trends, the presentation reviewed the survey question by question with special emphasis being placed on those questions that showed the greatest and least agreement or those with the highest extent or lowest extent (on the Likert scale) in terms of responses. During the presentation there were a variety of questions asked by both respondents and myself to clarify the meaning of the data.

This session helped to frame the final analysis and proved an opportunity for all employees (including the leader) to open a dialogue that included some of the key issues of the organization.

Fourth Consultant Review.

From the preceding session a report of findings (Martin, 1993) was prepared. The analysis included information from the interviews which was integrated with that from the quantitative survey. The report discussed the methodology (as outlined above) and then presented the results by separating the data into the four categories noted by Porras (1987) in his discussion of the Stream Organization Model: (1) organizing arrangements, (2) technology, (3) social factors and (4) physical settings. (In this particular use of the

Sawtooth Technique, the bulk of the survey questions fell under the category of social factors with physical settings having the fewest number of questions.)

Final Leader Briefing.

A final briefing was conducted when the report was presented to the SmallFirm leader. Shortly thereafter a copy of the report was sent to the corporate vice-president with direct managerial responsibilities for the SmallFirm office. This completed the portion of the change process that could be attributed to the Sawtooth Technique.

CHANGE IMPLEMENTATION. The leader then began a series of actions to move the office staff in new directions. To continue the open dialogue begun with the general session, he has instituted a series of "brown bag" lunches during which various issues are discussed, new directions set and training conducted. The duties of several employees have been redefined and several new ones have been hired. Although I have observed the office at work on numerous occasions and met with the leader to discuss the progress of various initiatives, the change process has been entirely in his hands. He has made all decisions and implemented all changes without consultant assistance. Among those changes most influential in the long term was a decision (ultimately approved and supported by the corporate office) to move SmallFirm into a new location. This significantly upgraded the local office's image to bring it more into line with similar corporate field offices in other major cities.

FINAL PROGRESS REVIEW. On February 25, 1994, I met with the leader to discuss his impressions of the effects of the Sawtooth Technique and the general successes of his desired changes to that point. The results of that meeting are reported in Chapter V.

LargeFirm

At the time of this study LargeFirm was a large office (about 100 employees and steadily growing) of a division of a Fortune 100 company employing over 43,000 service professionals on six continents. Services offered by the division ranged from facility management, systems and software development, and high technology research to biomedical support and engineering services.

Largefirm provides support services to the same primary customer served by SmallFirm and to a variety of other government entities. During the past several years LargeFirm had completed an intensive program to improve the quality of its software development techniques. Changing market demands within the local business and government communities had driven significant changes within the structure of the local office. Although the leadership of LargeFirm had been relatively stable during the preceding two years, the number of personnel and the quantity of work undertaken had increased significantly.

One legal issue complicated the participation of LargeFirm in this study. Although it was an ideal site for testing the studied methodology, I possessed a federal government contracting relationship with LargeFirm. For both legal and ethical reasons, therefore, it was necessary that I remain somewhat removed from the actual change efforts underway. It was also necessary for me to keep some distance from those personnel with whom I had a regular working relationship. Since the number of employees with whom I normally would have had contact in a contractual work sense was small (four), the interview and survey results were probably not negatively affected; however, this issue required that I work behind the scenes most of the time and rely upon a corporate-provided assistant. The support I received

was certainly excellent, but my lack of participation at certain quantitative data collection points may have impacted the final results in hard-to-determine ways.

The most obvious potential problem was in not being able to personally oversee the collection of quantitative survey data at the time surveys were completed. The steps taken to reduce the possible impact of this situation included the careful training of the corporate assistant and the maintenance of a set schedule for the collection of the data. In addition to having received personal instructions from myself as to delivery of the survey instrument, my corporate assistant was present during the session at the main office where I personally guided the survey completion aspects. When he and I discussed the data collection events where the assistant presided alone, I found no issues of significance that could have impacted upon the collection of valid data. Comparison of the qualitative data collected during the representative interviews with the survey (quantitative) data provided no inconsistencies that indicated that any problems existed with the methods of quantitative data collection. However, it is conceivable that my presence at those survey completion sessions would have allowed me to collect additional observed data to further the analyzation and integration of data prior to the general session where the preliminary survey analysis was reviewed with all available employees.

LargeFirm and the Sawtooth Technique

STRATEGIC PLANNING. Because of the changing economic conditions LargeFirm had begun to change its strategic market position within its industry several years previously. One area of traditional support had been dropped almost entirely and several large work groups of another corporation had been absorbed when that corporation had failed. During preliminary discussions with LargeFirm's leader I felt comfortable that they had established

a strong sense of strategic direction. This indicated an organizational readiness for changes needed to achieve the newly established directions for the firm.

THE SAWTOOTH TECHNIQUE. The research exercise with LargeFirm began officially on October 11, 1993, and followed the following schedule:

- * Leader Interview October 11
- * Employee Interviews October 15 & 19
- * Survey Validation October 25
- * Survey Administration November 9
- * First Leader Briefing December 9
- * Presentation of Data December 9
- * Final Leader Briefing December 20

Total Days for Sawtooth Technique Execution: 70

The Leader Interview.

The leader of LargeFirm had assumed his leadership role several years earlier when the local office began to change significantly the nature of its basic technical work area. He was in the final stages of a leadership oriented doctoral program and had extensive leadership and management experience in the past. Since we had maintained a working relationship for several years, I felt confident that he would be a steady supporter of the actions needed to complete the Sawtooth Technique application. The leader interview lasted approximately two hours. The same interview guide (Appendix A) as had served the SmallFirm interview was used. The leader expressed three primary goals which he wished to achieve by using this change acceleration methodology:

- * To use this research as a basic organization development opportunity;

- * To collect information for a business plan;
- * And to develop a sense of organizational synergy.

He expressed concern that communications between major program areas appeared to be weak, but he perceived no major problems of an interpersonal nature. He had a very high opinion of the people who composed the organization and felt that they routinely extended themselves in meeting LargeFirm needs. Several concerns were noted regarding the responsiveness of the eastern corporate headquarters to local needs.

At the conclusion of the meeting we established the general schedule for the next few steps. However, because of the size and complexity of the organization all dates were not established at that time. With the help of a general organization chart, the leader and I identified the major functional areas of the organization. From a listing that included all the people who worked in those areas (less those few with whom I had a contractual working relationship), I selected eight individuals without prejudice to complete the survey construction (interview) stage of the methodology. (I selected the potential interviewees without regard to the information they might provide, expecting them only to be representative of their respective work role.) None of those individuals were previously familiar to me. Those selected on a functional basis were then reviewed to see that men and women (four of each) and levels of responsibility (seniority, management versus non-management) were represented. One substitution was required to ensure that a senior program manager was included among the interviewees. (As with SmallFirm no attempt was made to identify a sample that would have produced data which could have been used to create organization generalizations. The LargeFirm exercise required more interviewees than SmallFirm because of the larger size, which, in turn, led to a difference in the

stratification of groups. Many of the same types of groups were represented, however.)

First Consultant Review.

The leader interview had left me with the impression that I would find several fairly distinct and somewhat independent groups within the organization as a result of their acquisition as an entity from the previous corporate structure. There was a question of communications to be investigated as well as potential management and supervisor issues. Because of the size of the organization the potential for hidden issues within certain entities provided an additional challenge.

Representative Employee Interviews.

Eight employees were interviewed, four men and four women. All interviews lasted approximately one hour. The interview guide used for the SmallFirm sessions (Appendix B) was reused and once again provided a satisfactory structure for the discussions. General comments indicated that there was some confusion as to the business nature of the corporate division as a whole, verifying the leader's concern for a lack of cross-project information flow. Most comments regarding the overall work climate and the management of the firm were of a positive nature.

An unusually strong allegiance to senior management was apparent. However, some concern was voiced regarding less senior managers; teamwork was also questioned. A sense of estrangement with the corporate headquarters (located in the state of Virginia) was noted. Most of the interviews were very positive in nature, and the employees seemed very willing to discuss any issue raised.

Second Consultant Review.

The interviews provided a sound base for the development of a tailored survey. Many

questions used with SmallFirm were relevant with some modifications being required to reflect the LargeFirm name and environmental differences. Since the size of the organization was significantly larger than SmallFirm, more demographic categories were selected from which to review the question data. Once again sex, location, career desires and type of work were selected. In addition age and the length of time working for LargeFirm were deemed to be of interest.

One of the issues that emerged from the representative interviews was an interesting view of firm management. Senior managers were seen in a most favorable light, but junior supervisory personnel were regarded as ill-prepared to discharge their responsibilities. To gather additional information regarding this topic questions 10, 11, 12, 13, 14, 20, 21, 22, 24, 28, 32 and 62 were noted as addressing this issue but from different directions. Question 62 had been formulated for the survey with SmallFirm and the others were drawn from the researcher's data base of potential questions. It should be noted that these questions also added insights to other identified issues. As questions were selected to address certain information needs, they were checked against other information needs to limit the size of the proposed survey to one that could be completed in 10-15 minutes by most respondents.

Survey Validation Meeting.

A summary of the data collected during the interviews was presented to those present. Unfortunately, several interviewees and the leader were not available for the meeting. (This was unfortunate in that the individuals who participate in the interview process may well be critically important in introducing the value of the change process to the rest of the organization. The possibility of rescheduling this meeting was considered, but participant schedules indicated that the full cast of participants would not be available for several more

weeks. This created a delay problem that would have affected the ability to provide for a general feedback session as well as providing an excessive delay in the employment of the Sawtooth Technique. I made the decision that to proceed in this case with less than the desirable number of participants was more important than to maximize participation.) Several questions as to the meaning of data collected earlier were answered, and the demographic categories were verified as appropriate. Because of the reduced participation of interviewees and the leader at this early stage I noted a personal feeling that some momentum established during the interview process appeared to be lost.

Third Consultant Review.

The climate survey (Appendix D) was finalized. Most of the questions chosen for this survey were the same as for SmallFirm. (This was not surprising as both firms were similar in the functional nature of the technical aspects of their work and the markets within which they provided their services.) The LargeFirm individual assisting in completing the research steps reviewed the wording to provide a final check in ensuring that questions were not misleading nor using organizational terms incorrectly. Once again the survey consisted of 63 questions with responses evaluated on a 5-point Likert scale. Two questions also provided an opportunity to add special comments regarding best and worst things of the working environment. Six demographic questions completed the format.

Survey Administration.

The survey administration was begun during the morning of November 9, 1993, at a LargeFirm main office conference room. For the first group of largely administrative and management personnel, I personally provided a short briefing on the purposes of the survey and supervised the completion and collection of the forms. (All the surveys during that

session were completed in fifteen minutes or less.) For all other sessions my designated agent performed the same functions. Since many of those other personnel worked at a main client site, several days were required to complete the survey effort. A total of 68 forms (from 100 employees then working for LargeFirm) were completed and returned for analysis.

Consultant Preliminary Analysis.

The SPSS/PC+ software was again used to compute the mean and standard deviation for each of the Likert-scaled questions. Because of the larger number of individuals participating in the survey effort and the larger number of demographic categories, much more information requiring review was noted. The responses to the two open questions were sorted by hand and then categorized as to the general themes expressed.

Consultant Leader Briefing.

This briefing was delayed because of the travel requirements of the leader and also to allow the corporate division manager with responsibility for LargeFirm to attend the briefing and the immediately following presentation to the assembled employees. This session was designed to eliminate surprises and to prepare the two leaders for participation in the presentation discussions.

Presentation of the Preliminary Survey Data Analysis.

Providing a space large enough for all LargeFirm personnel to meet required a rented room at a local recreation area. Refreshments were served and both leaders were present in the room when the presentation was made. The presentation format was similar to that for SmallFirm. Questions were reviewed individually in numerical order with special emphasis placed on those with the most extreme answers, high or low, and the most or least agreement. Certain groups that responded differently to some questions were also noted.

The responses to the presentation were much less interactive during the session than that with the smaller group. Although the size of the group probably inhibited some discussions, the leader pointed out at a later date that the quantity of information was probably overwhelming to many. Because of its greater complexity (greater than SmallFirm), his assessment appears to be the most logical explanation. (Probably with the larger group a more summarized format would have been appropriate, thereby allowing more time to develop individual comments regarding the most important areas.)

Following my presentation of the preliminary analysis, a very lively discussion session involving the body of employees and the two leaders followed. Although some of the topics were common to the survey, many ranged far afield. It might be assumed that the preceding session, although not particularly dynamic itself, had provided avenues for further conversations that were more immediately relevant to the individuals concerned.

Fourth Consultant Review.

Following the presentation, I reviewed the data again and identified several more areas worthy of investigation by the organization and its leader(s). This was compiled by question and prepared for presentation to the leader.

Final Leader Briefing.

A final meeting with the leader was conducted and the enhanced raw data was provided to him. Also present at that meeting was a change consultant retained by LargeFirm to continue to guide the change process. Because of the size of LargeFirm the leader felt that assistance in maintaining the momentum begun with this research was necessary to ensure desired changes were identified and initiated in a timely fashion. The new consultant indicated that he intended to use the existing data as a starting point for the collection of even

more focused information as the change effort continued.

CHANGE IMPLEMENTATION. Working with the new change consultant, the leader began to address issues identified as important within the LargeFirm strategic plan. A chance meeting with one of the survey construction interviewees at his on-site work location provided the comment that changes were coming at a "very slow rate." Based on the pattern of Sawtooth Technique step completion, this probably reflects the realistic time frames dictated by a large, diverse workforce located at various work sites.

The new change consultant expected to continue the development of a new organizational character by addressing the situation with a three-part project (Jennings, 1994):

1. Part 1 would include the design of the climate project (using the Sawtooth Technique data), development of a project team and education of LargeFirm employees as to the relevant aspects of the plan.

2. The climate change plan would be implemented during Part 2. This would include the training of employees regarding the appropriate climate topics and issues, monitoring of the climate, creation of an alternative climate plan and the selecting and training of a second project team.

3. During Part 3 the alternate climate plan was to be implemented and monitored.

FINAL PROGRESS REVIEW. On March 30, 1994, I met with the leader to discuss his impressions of the effects of the Sawtooth Technique and his change implementation process. The results of that meeting are reported in Chapter V.

General Comments

Following the two field tests, I continued to feel that the Sawtooth Technique could add considerable value to many change processes. From the observations of the methodology

being practiced in realistic, real-life settings, it appeared that several seemingly minor considerations could greatly enhance the performance of the technique. Those and other general conclusions are reported in Chapter V.

With the permission of the leader of LargeFirm, I have provided in Appendix E data representative of that collected by the use of the climate assessment survey (please see Appendix D). Although the purpose of this study was to examine a methodology capable of guiding (and possibly accelerating) the first steps of an organizational change process (and not to follow that process to its conclusion), it is still important to see the quality and depth of information that can be obtained through this diagnostic effort. It is expected that the organization under the guidance of the designated leadership (and appropriate line management) would use this data to continue the change process by developing a focus upon those areas which would most enhance the accomplishment of the organization's business goals.

Example Use of Quantitative Data

The first step would be to review each of the questions without regard to demographic groupings as to those whose answers are to the highest degree or lowest degree on the Likert scale used. (There is no fixed number that should be examined on each of those extremes, but with a survey of the size used in this climate assessment process ten of each would probably be a large enough group to provide a first look.) Each of those questions should then be examined to see if the extremes in terms of degree indicate a response that is worthy of further study or merely a descriptive aspect of the organizational character.

Following this first look at mean extremes, the next step would be to examine the standard deviations for each question for the greatest and lowest values, the former showing

a greater relative disagreement among the respondents and the latter showing a greater agreement. Time must also be taken to examine each question individually to ensure that a seemingly "average" response does not also serve as an indication of a potential key issue. As a rather vivid example, a question asking if the respondent were aware of sexual harassment incidents within the organization would, in many cases, show relatively few people answering toward the most affirmative end of the Likert scale. However, with this type of volatile issue, any strong feelings by only a few (statistically insignificant) employees would be a sign that further exploration or action was required.

Following this review of question means, the means of each demographic group within a question should be examined for significant differences from the total population mean and from other demographic groups for that question. At this point the researcher and change agent would be looking for meaningful differences between groups that could reflect hidden issues disruptive of a positive work environment within a diverse work force. Although a familiarity with statistical concepts can be valuable during this evaluation process, it is not critical because many of the questions and their associated responses must be judged by qualitative methods, the researcher's or client's value measures.

When the individual questions have been examined, they should be reviewed for interrelationships. Although statistical methods for measuring correlation may be of value, an alternative method may be of more common value to the non-mathematician. As used in preparing a final analysis for SmallFirm, such tools as stream analysis (Porras (1987) may help in organizing the results. (This researcher has found that even organizations heavily involved in engineering and scientific activities seem to appreciate results reported by other than statistical means.) The Sawtooth Technique also provides two ways to verify the

mathematical results of the quantitative survey: the qualitative data collected during the survey construction process and the clarifying information collected during the general meeting to view survey results. This can allow the triangulation of data and help to explain some of the interrelationships that might not be obvious from the raw data.

The following example serves to further illustrate the above analysis process by reviewing one particular question from the survey completed with LargeFirm.

QUESTION 6. Are those who contribute the most to getting the job done rewarded the most?

The population mean was 2.93 with a standard deviation of 1.08. The review of standard deviations would not probably have noted this question as noteworthy but the mean of 2.93 would most likely be chosen as unusually low for this type of question. Further analysis by reviewing the demographic groupings as to response show the following:

BY SEX	MEAN RESPONSE	STANDARD DEVIATION
Male	3.0244	1.0121
Female	2.6875	1.2500

Analysis: Men tend to be more positive than women and also are more in agreement as to that ranking.

BY CAREER DESIRES	MEAN RESPONSE	STANDARD DEVIATION
Yes	3.0189	1.0468
No	2.5000	.7071

Analysis: No conclusions possible. (No is only 2 cases.)

BY LOCATION OF WORK	MEAN RESPONSE	STANDARD DEVIATION
Main office	2.9565	1.1473
At client site	2.9697	1.0150

Analysis: No significant difference as to work site.

BY AGE	MEAN RESPONSE	STANDARD DEVIATION
Less than 30	3.0000	1.2247
30-39	2.5714	1.0894
40-49	2.8125	.9106
50 and older	3.2778	1.1275

Analysis: Interesting variation worth exploring. Oldest and youngest are most positive about this issue.

BY TIME WITH LARGE FIRM	MEAN RESPONSE	STANDARD DEVIATION
Less than six months	3.2500	1.5000
Six months to two years	2.8889	1.0631
Greater than two years	3.0625	.9979

Analysis: Slightly more positive for those most recently hired with the most negative responses from those with intermediate times of employment. Additional information needed to test significance of that difference.

BY TYPE OF WORK	MEAN RESPONSE	STANDARD DEVIATION
Technical	2.8462	.8806
Management/Supervision	3.7333	1.0328
Administrative support	2.1818	.8739
Other	3.0000	1.1547

Analysis: Management and supervisory personnel are significantly more positive than other groups and administrative personnel are clearly quite negative. This demographic grouping seems to show that rewards as perceived by those performing administrative support within the engineering-focused firm are not equitably distributed among those who most earned them. It may signal more specifically that they feel that their particular work is not valued as highly as that of others. It may also show that management personnel are perceived as receiving rewards disproportionate to their contribution. More information is needed to confirm any of the above conclusions.

Following this process with each question, the change agent would link the various questions together looking for some form of triangulation. In the case of the above Question 6 example, other questions regarding happiness with work assignments, work loads and working relations would be reviewed for similar answering tendencies. With this survey, related questions might be numbers such as 7, 9, 18, 21, and 23.

Using this information and assuming a participative approach would continue to be used following the Sawtooth Technique exercise, a representative team from LargeFirm would review the data for this question and others to identify more specifically the key issues within

the organization. It is conceivable that additional interviews or clarifying quantitative surveys might be scheduled with members of groups that responded quite differently from the organizational mean or from other subgroups within a particular demographic category. The process of continuing to involve the people in identifying and helping to address problem issues should help to develop a sense of control and "ownership" in the subsequent solution. It would be "our" ideas instead of "theirs" that led to the needed changes.

CHAPTER V

DISCUSSION AND RECOMMENDATIONS

Summary of Results

The methodology described in Chapter IV integrates two commonly separated processes in the organization change process, planning and implementing. It also calls upon the leaders of any entity undergoing such change to involve more fully the people to be affected by the changes during the earliest planning stages. By so doing much of the commonly cited resistance to change is never developed, because those same people begin to possess a sense of control over their work environment.

Unfortunately, the state of change practice has not progressed much beyond Bennis' (1966) stated need for more methodologies for accomplishing change. This lack of strategies from which to choose, as well as many well-publicized failures of the management theory of the week, may lead the practitioner to believe that no real solution exists. The problem appears to this researcher to be one of integration, a process that is hampered by the many boundaries that have been constructed by academics and consultants alike and the related inability to bring the most appropriate forces to bear on a given situation.

In the case of consultants and practitioners, it may well be to their personal and business advantages to hold closely the keys to their successes. Much literature that emerges from the experiences of practitioners appears to be written with a summary viewpoint, often not including the key details that are needed to replicate a change effort. The many case studies presented can be confusing to the practitioner who does not already possess significant

experience in changing organizations. Environments can dictate important aspects of a strategy, and there is a need to adapt solutions to fit problems. In practice problems may be misidentified, intentionally or unintentionally, so that a known solution will appear to fit.

The problem within academic circles is of a different vein. Although there is a wealth of material that might aid in developing societal solutions, much of it remains within strictly segregated academic societies that develop their own languages, formats, assumptions and evaluation methods. The practitioner then finds it difficult to identify, understand and translate research of value. Practical tools remain in the research archives.

Case studies of various success stories are difficult to relate to a given situation until many are studied. They are excellent learning tools for the business student but an overly demanding source of information for the business leader in need of immediate help. Consultants, bearing their particular problem-solving structure successfully, pick the low hanging injured fruit from the management problem tree, but they often leave behind the systemic illness that produced the damaged fruit. Senge (1990) and Covey (1991) provided a version of that theme spoken to earlier by Argyris (1971) but without establishing or even suggesting clear corrective directions.

The quality program proponents such as Deming (1986) and Crosby (1979, 1992) have asked for a focus on process and demonstrated a convincing case for emphasizing quality above all else. When Total Quality Management couldn't solve everyone's problems, along came re-inventing the corporation (Naisbitt & Aburdene, 1985). Later it was time to re-educate (Tobin, 1993) and rethink it (Tomasko, 1993).

Organization psychologists such as Conner (1993) have pushed toward the heart of the problem but without developing a clear concept with which to address it. A wealth of

material remains within such fields as psychology, sociology, organization development, and political theory, but the practical tools remain elusive.

The Sawtooth Technique begins to address this lack of tools for the change agent. Although it appears to require sound leadership and an understanding environment to be successful, it provides a step-by-step procedure for involving an organization's people in guiding the success of that organization. It views people in the manner of McGregor (1960) and Deming (1986) in that they will accept responsibility and commit to objectives that benefit the organization when rewards can be associated with the corresponding achievements. By allowing those most affected by the potential changes to understand and participate in the framing of change, the leader no longer is faced with a program to sell to the masses. Instead, the issue is, "How do we get it done?"

Lessons from the Field

The two practical applications of the Sawtooth Technique helped to test the adequacy of the methodology and the size of the environments within which it might be effective. In spite of my initial reluctance to demonstrate it within a small unit (of eleven people in this case), it proved most effective there, at least within the relatively short period of this study.

As the Sawtooth Technique was used within SmallFirm, it served as a fairly complex and involved transition workshop. During an evaluation interview the leader of SmallFirm attributed much of his initial success at the company to the rapid manner in which the technique allowed him to identify key issues, develop open communications with his professional staff and assess his internal and external resources. Although other environmental conditions undoubtedly contributed to the successes noted during the first full financial quarter of his administration, he felt the technique contributed heavily to the

retention of all staff members (he had anticipated the loss of as many as four of them during the transition period) and a rise in sales of over 100 percent.

On the other hand, the same steps could not yet be attributed to any significant changes within LargeFirm when the final leader interview was conducted on March 30, 1994. Although there was evidence that significant change efforts were underway (to include an employee group dedicated to assisting the leader in effecting changes), the process was retarded by the structure of the business in serving clients at various locations remote from the main office and by the size of the organization, which limited direct communications on a regular basis among all employees. Additionally, the exercise of the participative aspects of the Sawtooth Technique was affected by organization schedules and the non-availability of key individuals at times when their presence had been anticipated. This reduced participation and slowed the development of employee involvement.

In addition, the consultant and the leader of LargeFirm both agreed that the analysis of data as presented to the technique participants should be better refined to present the information in a more clearly understandable manner. When the participants are few in number, the contact with the consultant can be frequent and very open. As the numbers of participants increase, the relationships formed become more involved and less personal. This tends to restrict the flow of information and complicates the two-way communications efforts.

The need to transfer the facilitation of the change process at LargeFirm from one consultant to another, particularly after the survey data presentation, appeared to slow the change process. Just as participants were beginning to accept me and develop a sense of trust, I stepped away and another individual assumed the change assisting role. This may

have effectively reduced the Sawtooth Technique to an information gathering tool rather than one to promote participation. Although the process continued under new guidance, the warning listed in Chapter IV concerning the need to move in a steady fashion without undue delays was probably violated. On the other hand, this observed reduction in results in the field seemed to verify the importance of the aspect of timing.

As the process continued I became more and more aware of the need for professional guidance in executing this methodology. My original belief was that a well-defined technique would preclude the need for consultive assistance, but the skills needed at key junctures indicated otherwise. Some of the most important skills included:

- * The ability to interview individuals without biasing the answers through biased questions;
- * Experience in designing surveys;
- * Experience in analyzing survey and interview results;
- * Knowledge of a variety of organization options; and
- * Significant understanding of human behavior and the observation skills needed to record and evaluate relevant behaviors.

What Makes the Sawtooth Technique Different

The yet-to-be-determined degree of success of the two field experiments still seems to indicate the realistic possibility of developing methodologies that are capable of assisting organizations to accomplish complex changes to their characters and, ultimately, their cultures. The belief that large amounts of time are required between the commencement of such an effort and the achievement of significant results was largely disproved by SmallFirm and proven by LargeFirm. This inconsistency actually shows the importance of taking into

consideration entity size and local environment when commencing such a project, but it does not necessarily doom large organizations to slow results. The history of the Navy's retention efforts argues that eventually even very large units can address their problems quickly when the process of change can be carefully tailored to the specific problems encountered.

This strategy differs from other such schemes in that it does not attempt to treat all problems with one set of solutions. It begins with an accurate diagnosis (often a survey as guided by interviews) to establish the current position of the organization. It is dependent upon the existence of a vision or strategic plan to provide a destination. Then it uses the natural creativity and energy of the organization's people as the engine of change, simultaneously reducing the resistance to change and the resources often commanded to overcome it.

If an organization seeks to improve quality through process improvements, the Sawtooth Technique can be one vehicle to assist the implementation of a total quality structure. If the desire is to establish a process of reengineering, then this process can be used for those purposes also. The technique is not dependent upon any one management theory but can provide an implementation structure or integration format for any of them that are appropriate for the environment in question.

As an example, the time immediately following the completion of the general briefing session for an organization climate survey is ideal for the establishment of the quality management structure outlined by Deming (1986) to include the executive steering group (senior managers), quality management boards (functional management areas) and process action teams (the process improvement action arms). This organizational structure can then begin to address the problems identified during the diagnostic process at a time when

organizational enthusiasm for change and participation should be high.

The roots of this procedure originate in psychology and organizational psychology. The Hawthorne Effect (Roethlisberger & Dickson, 1939) is definitely present but so are basic human needs and motivations as expressed by McGregor (1960), Maslow (1943, 1962), Herzberg (1966), and Conner (1993). It is a positive approach to change with a basic belief that employees will team with their leaders when they are allowed to see personal benefits in accomplishing the needed changes.

Leadership

Leadership remains a key ingredient. Leaders must sponsor and legitimize change (Conner, 1993) as well as provide the physical and psychological assets needed to proceed. Ultimately they decide which changes will be made and must coordinate these changes within a large environment that often does not stop at the organization's front door.

The Sawtooth Technique tends to drive changes by placing special emphasis upon the "soft" or human issues. Oakley and Krug (1993) note that these "issues consist of less tangible aspects that are much more subjective and less easily measured or charted than the hard issues" (p. 45). Leaders must develop the ability to change attitudes as well as procedures in order to build the acceptance of change into the structure of the organization. Since this is often not a "scientific" and orderly process framed by neat rational steps, technically oriented leaders, who have been so successful in advancing industry and the scientific method in the past, often struggle to survive a confrontation with a work group or union official.

The age of the post-capitalist society has arrived in the United States. Significant changes in the workforce have come with it. The knowledge worker now replaces the assembly line

worker that grew from the early days of the industrial revolution and Frederick Taylor's Scientific Management (Drucker, 1993). This change dictates a change in leadership style and organization structure to produce the products for markets of the next century.

Yet the basic educational system, business community and overseeing governments continue to focus on the individual and place teamwork in an inferior position of value. Many organizational leaders have never seen teamwork except as directed by a superior, making it difficult to picture a participative management technique of any type. The key in changing this understanding is in demonstrating through practice and appropriate evaluation the power of management-guided change rather than management-directed change by using a set methodology such as the Sawtooth Technique to guide participation within a relatively understandable framework.

The Necessary Environment

Although human beings constantly experience change, large-scale changes, wherever they occur, often challenge the ability of those affected to accept them in stride. As per Conner (1993), if people are given a sense of control as to the changes required and the manner by which they are made, they often can adapt very rapidly and with a minimum of resistance. Participation, then, is a major key to any change environment, and without it the leader will need to devote considerable resources in order to convince the organization's people that the changes should be accepted as part of a new culture. This would explain the need for collaborative change implementations as reported by Dunn and Swierczek (1977). This is also consistent with the arguments of Lewin (1951), Argyris (1971) and Senge (1990) that reducing the forces opposing change would be less demanding than increasing those in favor.

The leader must possess an understanding of the change process in general and the

specific changes that may be needed. The leader must provide some general guidance (as with a vision and/or strategic implementation structure) and then allow the energy (motivations) of the others within the organization to provide power for the change as well as a much needed breadth of knowledge within the needed fields of expertise. The leader's behaviors must mirror the stated goals and directions to prevent confusion between espoused and demonstrated beliefs since behaviors observed by employees will be interpreted as indicative of the leader's true intentions. However, the specific accomplishment of the total change process must become largely driven by all the members of the organization rather than by a few senior officials who dictate or by some other manner assign directions.

For significant changes a consultant (or several consultants working together) may well be required to guide the process and provide a neutral source of observations and alternatives. This can be particularly effective at the beginning of a change process in promoting communication and bringing key issues to the table for discussion.

Based upon the field demonstrations of the Sawtooth Technique and previous applications by the United States Navy, size is not a factor limiting the use of a set methodology. Although any procedure may take different forms based upon the size of the effort and organization structure, both large and small organizations may benefit. In the case of a small firm, the demonstrated technique appears to be a sophisticated transition workshop, drawing together the members of a team. For a larger entity, the process is more demanding in time and coordination but can achieve the same type of successes.

As long as the methodology maintains a flexible approach, the issues of profit or non-profit and private or public sectors do not appear to affect the use of a guided change technique. This conclusion is based not only on the two field tests observed during this

research, but on prior observations during similar change efforts within the U.S. Navy retention environment and the government research laboratory.

In the final evaluation of any change, results that serve the best interests of the organization must be evident. This demands a vision and a framework, most likely to be provided by the organization's leader(s).

Strengths and Weaknesses of This Study

The strength of this study lies primarily in its integration of the studies and ideas of academicians and the experiences in their applications by practitioners. This represents a beginning in assembling practical tools that can translate an academic dialogue into practical societal value. With many of society's major institutions under attack and the economic sector addressing a potential paradigm shift away from the industrial one of the past two hundred years, the time has come to bring together the human behavioral research of the past century and to learn to apply it in practical, demanding situations. The Sawtooth Technique is one of the first such vehicles that I have encountered.

In addition to the presentation here of a methodology that can guide change, the literature review tended to show some indications that current practices do not align with the existing research and should be used with caution. Some of the questionable practices include:

- * A belief that change should begin at the top of an organization and then proceed downward. (The opposite, change beginning at the bottom and going upward, also does not provide consistently successful change efforts.)

- * An over-reliance upon technology and industrial techniques reflecting an environment that no longer exists. (In a society dominated by technical and disciplinary experts, human beings have not been given their fair share of attention.)

* Solutions successful in one situation applied to another, dissimilar one. (Flexibility is lost in a rush to find the incredible "quick fix.")

These and other practices that limit the ability of leaders to adapt to a new and ever-changing environment can severely limit the ability to build for the future. By demonstrating a practical flexibility that uses well-accepted human behavioral research, the Sawtooth Technique challenges other practitioners to respond with the tools needed to make organizational change consistently successful.

A factor that provides both strengths and weaknesses to this study is the long association of the author to systems undergoing change and the techniques used to guide them. Although I have observed changes throughout my working life, since 1981 I have been actively involved in observing and assisting organizations to change. Both public sector and private sector experiences are included during that time as well as successes and failures. This has provided me with some very valuable insights that have guided several areas of the research.

Among the most valuable of these experiences were the participation in the U. S. Navy retention improvement efforts of the early 1980s, a restructuring of the Navy's leadership programs in the late 1980s and the implementation of Total Quality Leadership in both military and civilian units of the Navy during the 1990s. Not only was I given the opportunity to observe changes being planned and implemented, but I was able to interact with many of the key theorists (such as Warren Bennis and Peter Drucker) and practitioners (the Navy Total Quality Leadership implementation teams as trained at the Navy Personnel Research & Development Center in San Diego, CA).

This close association, however, could also be considered a weakness in that I have

undoubtedly formed opinions based on those very experiences that now frame my ability to see other options. It is distinctly possible that my approach to this study might have taken a different tone (possibly more quantitative, as an example) had I not seen the value of a qualitative (subjective) and quantitative mix.

Another weakness is the confidentiality required to protect the specific data gathered during the field tests of the technique. Although this data appeared to be of considerable value to the two business entities, I could not report it in its entirety without compromising the names of the two firms and issues of a proprietary nature. The reader could well achieve a better sense of the power of the Sawtooth Technique if this data could have been included in its totality along with the balance of the study.

The most significance weakness, however, lies in the short time period available to study the two firms. In order that the success of the changes be accurately assessed, several years would probably be required to make good sense of the change process. A second diagnostic survey process (again participative, perhaps) could then assist in measuring actual changes in the climate which could be paired with performance factors for the organizations over the same period. This would match results in a business sense with a change in human responses to organizational issues. Without this type of information, the study must remain descriptive and not prescriptive. This must limit the use of the technique until it can be more fully evaluated over time.

Implications for Future Research

As noted in the discussion of strengths and weaknesses, the most specific need for future research generated by this study lies in a need for a more comprehensive evaluation of the Sawtooth Technique in practice. Until its practical strengths and weaknesses have been

better defined, its use by organization leaders and change consultants would likely remain very limited. As a starting point, a continuation of the studies of SmallFirm and LargeFirm would be helpful. However, it would be even more valuable to extend the use of the technique to other organizations in very different environments.

The educational system, as an example, could use this technique in building more cohesive teams within a given school, a school board and its staff or a school district's administrators. Non-profit organizations that provide charity services and have a need to reduce overhead expenses might also benefit. Other entities within the public sector environment could include the justice system (to include courts and prisons) and various government service agencies. These organizations in company with the entire spectrum of private sector business could verify the appropriate uses of the technique.

A second area of concern emerged from this research and was most clearly demonstrated during the literature review. In the academic pursuit of detailed knowledge about everything that constitutes the human world, the study of each major subject area becomes isolated from all others. Specific languages, measures and assumptions then create a sub-world that tends to be defined as if it were separate from all other aspects of its environment. While this isolation may be necessary to assist in clearly defining that discipline in great detail, it can be very detrimental in finding practical uses for the fruits of those studies.

The improvement of organizations calls loudly for the integration, as opposed to segregation, of the many relevant fields of knowledge. Technology without the social structures that use them can drive organizations in a direction that a society can eventually no longer tolerate. The rate of change noted by Toffler (1970) will ultimately cause its own demise if the human population cannot adjust to it. An over reliance upon human behavioral

research might have the same effect if the environment's technological assets were to be ignored. Organizational change does not exist in a vacuum, and each case should be examined within its particular environment. If a tool from any discipline--whether it be psychology, politics or engineering-- should prove appropriate to a task, it should be utilized. This implication for future studies goes beyond this particular research and applies to most research as it affects the society of today. The integration of disciplines should be given a weight of value appropriate to that given to any of the specific disciplines.

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APPENDIX A
LEADER INITIAL INTERVIEW GUIDE

Org. Code _

LEADER
Initial Interview

Ask for general descriptive literature regarding the overall firm.
Ask for literature specific to the entity under test.
Request letter approving research.

1. What is the basic mission of this entity/office/group?

2. Do you have any specific goals that you wish to achieve during this research project?

3. Are there any specific problem areas of which you are aware that should be emphasized during the interview or survey processes?

4. Would you please discuss your organizational structure? Are there any peculiarities that should be explored?

5. Would you please generally discuss the personnel of the organization under test?

6. Are there corporate issues that should be explored?

7. How would you rate the overall morale of the people? What indicators of that mood make you think that?

8. Are there any immediate inside or outside threats to the business of this unit as it exists today?

9. Are there any other issues you would like to see explored by the interview or survey processes?

Arrange for employee interview date. Discuss personnel selection.

Establish overall schedule for research.

Interviews

Review interview results/Discuss survey questions

Administer survey

Survey feedback

Action planning

Final review

APPENDIX B
EMPLOYEE INTERVIEW GUIDE

EMPLOYEE INTERVIEW

Reason for collecting data.

Sign release form. Copy to interviewee.

Emphasize anonymity.

ID CODE ___

Age __

Education

Management Education

Special Skills

How would you describe your work environment? (Facilities, working conditions, support staff)

How would you describe the supervisory leadership you experience? (Decision making, motivation, communications, conflict)

Describe your immediate work group. (Satisfaction, training, performance)

Can you describe the goals/missions of your organization? Of your specific job?

How do you feel about the rewards you receive for your contributions to the organization? (Achievement, recognition, discrimination/favoritism, compensation)

How would you rate your personal satisfaction? That of other members of the organization?

**How would you describe the level of stress you are personally experiencing at this time?
Do you have any specific areas that bother you more than others?**

What are the most positive aspects of working for this organization?

What are the most negative aspects of working here?

If you could change one or two things, which would you choose to modify?

APPENDIX C
SMALLFIRM
ORGANIZATIONAL CLIMATE ASSESSMENT SURVEY

ORGANIZATIONAL CLIMATE ASSESSMENT

This survey is designed to obtain your thoughts about your job and your organization. Your frank, candid opinions are important and sincerely welcome. Please read each question carefully before responding. Circle the number that most nearly represents your opinion.

If you do not feel that a question applies to you, please leave it blank.

Your responses will be kept strictly confidential. Please do not put your name or other self-identifying marks on this document. The information you provide will be added to that of other participants for the purposes of data analysis. No groupings of data that include answers from fewer than four persons will be reported in the results of this survey.

Information collected by this means will be utilized by your organization as a guide for action planning that is designed to improve the working environment of your organization. You will be invited to participate in the analysis of the data and in developing solutions to problems identified. The data will also be used by the researcher who is monitoring the change process to assess the success or failure of change efforts.

Providing this information is voluntary, and your assistance in this effort is greatly appreciated.

Privacy Act Statement

Public Law 93-579, the Privacy Act of 1974, requires that you be informed of the purposes and uses to be made of this survey. Authority to collect this information is granted in Title 5 of the United States Code. Providing this information is voluntary. The information will be used for statistical purposes only.

TO WHAT EXTENT ...	Very Small Extent	2	Some Extent	4	Very Large Extent
1. Are you given the information you need to know to do your job in the best possible way?	1	2	3	4	5
2. Does the office library provide sufficient resources to support your normal work assignments?	1	2	3	4	5
3. Are the decisions in this organization made at the levels where the most adequate information is available?	1	2	3	4	5
4. When decisions are being made, are the people affected asked for their ideas?	1	2	3	4	5
5. Do you feel motivated to contribute your best efforts to the mission and tasks of the organization?	1	2	3	4	5
6. Are those who contribute the most to getting the job done rewarded the most?	1	2	3	4	5
7. Does the organization have a real concern for the welfare and morale of assigned employees?	1	2	3	4	5
8. Do you feel you understand the goals and objectives of your work group?	1	2	3	4	5
9. Is the workload fairly distributed among the members of your work group?	1	2	3	4	5
10. Is your immediate supervisor easy to approach to clarify work to be done?	1	2	3	4	5
11. Are you motivated to bring problems with your work assignment to the attention of your supervisor?	1	2	3	4	5

TO WHAT EXTENT ...	Very Small Extent	2	Some Extent	4	Very Large Extent
12. Does your supervisor encourage team performance in the completion of assigned work?	1	2	3	4	5
13. Does your supervisor encourage new ideas that can improve work group performance?	1	2	3	4	5
14. Does your supervisor assist you in improving your performance?	1	2	3	4	5
15. Do you feel that your immediate work group could improve its performance?	1	2	3	4	5
16. Do members of your immediate work group encourage each other to work as a team?	1	2	3	4	5
17. Are members of your work group easy to approach?	1	2	3	4	5
18. Do office-based staff work well with those who complete most of their work at another location?	1	2	3	4	5
19. Are members of your work group helpful to you in resolving work problems or conflicts?	1	2	3	4	5
20. Is the work schedule for your work group well planned?	1	2	3	4	5
21. Do those who work on federal projects interact positively with those who work on state tasking?	1	2	3	4	5
22. Do you have confidence in your supervisor to handle difficult situations well?	1	2	3	4	5
23. How satisfied are you with your present job assignment?	1	2	3	4	5

TO WHAT EXTENT ...	Very Small Extent	2	Some Extent	4	Very Large Extent
24. How satisfied are you with your supervisor?	1	2	3	4	5
25. All things considered, how satisfied are you with this organization?	1	2	3	4	5
26. Do you feel that there is favoritism involved in the process of work assignments?	1	2	3	4	5
27. Does your work assignment give you a sense of achievement?	1	2	3	4	5
28. Does your supervisor regularly recognize those who perform well?	1	2	3	4	5
29. Have you been adequately trained to perform the technical aspects of your job?	1	2	3	4	5
30. Do you have a fair opportunity for promotion?	1	2	3	4	5
31. Do you feel that you receive appropriate financial compensation based on your job assignment and performance?	1	2	3	4	5
32. Are people at higher levels of your organization aware of problems at your level?	1	2	3	4	5
33. Are there problems relating to race or culture within your organization?	1	2	3	4	5
34. Are there problems relating to gender relations within your organization?	1	2	3	4	5
35. Do you receive a fair and objective evaluation of your performance?	1	2	3	4	5

TO WHAT EXTENT ...	Very Small Extent	2	3	4	Very Large Extent
36. Do you feel that you have an equal opportunity for obtaining training and educational assistance?	1	2	3	4	5
37. Do you usually have the equipment and supplies you need to complete your assigned work?	1	2	3	4	5
38. Do you feel challenged by your work assignment?	1	2	3	4	5
39. Is safety given a high priority by members of your work group?	1	2	3	4	5
40. Are the deadlines for completion of your work realistic?	1	2	3	4	5
41. Do you routinely feel that you must go through "red tape" to get things done?	1	2	3	4	5
42. Are innovative ideas encouraged within the organization?	1	2	3	4	5
43. Are individual talents taken into account when work assignments are made?	1	2	3	4	5
44. Is the open discussion of conflict encouraged by your supervisor?	1	2	3	4	5
45. Would you find it helpful to you to better understand career patterns and choices within SmallFirm?	1	2	3	4	5
46. Would you benefit from the formal assignment of a mentor?	1	2	3	4	5
47. Do you take pride in being a member of this organization?	1	2	3	4	5

TO WHAT EXTENT ...	Very Small Extent	2	Some Extent	3	4	Very Large Extent
48. Does this organization make a strong effort to recognize family concerns?	1	2	3	4	5	
49. Do you enjoy your work most of the time?	1	2	3	4	5	
50. Are communications between all San Diego personnel effective?	1	2	3	4	5	
51. Could the overall performance of the San Diego office of SmallFirm be improved?	1	2	3	4	5	
52. Does the San Diego office maintain the image standards representative of SmallFirm?	1	2	3	4	5	
53. Do San Diego SmallFirm personnel possess strong technical skills in their respective work areas?	1	2	3	4	5	
54. Do those who work away from the main office possess strong <u>business</u> skills?	1	2	3	4	5	
55. Do those who work in the main office possess strong <u>business</u> skills?	1	2	3	4	5	
56. Does the main office provide adequate computer hardware and software to support your work assignments?	1	2	3	4	5	
57. Are the facilities where you perform the majority of your work adequate?	1	2	3	4	5	
58. Do you understand the business directions established for the San Diego office of SmallFirm?	1	2	3	4	5	

TO WHAT EXTENT ...	Very Small Extent		Some Extent		Very Large Extent
59. Would you like to participate in planning future San Diego business objectives?	1	2	3	4	5
60. Is corporate-provided training adequate to assist you in achieving your career goals?	1	2	3	4	5
61. Does your work give you a strong sense of achievement?	1	2	3	4	5
62. Do the senior members of the local office set examples when it comes to high quality performance?	1	2	3	4	5
63. Do you feel that you will look for employment elsewhere during the next year?	1	2	3	4	5

64. If you had the opportunity to change one thing within your organization to improve it, what would you change?

65. What do you enjoy the most about working for SmallFirm?

66. I am ___ male ___ female.

67. I would like to establish a long-term career within
SmallFirm.

___ yes ___ no

68. I work mainly at
___ the main office ___ another location

69. My work is mostly with
___ federal projects ___ state projects

APPENDIX D
LARGE FIRM
ORGANIZATIONAL CLIMATE ASSESSMENT SURVEY

ORGANIZATIONAL CLIMATE ASSESSMENT

This survey is designed to obtain your thoughts about your job and your organization. Your frank, candid opinions are important and sincerely welcome. Please read each question carefully before responding. Circle the number that most nearly represents your opinion.

If you do not feel that a question applies to you, please leave it blank.

Your responses will be kept strictly confidential. Please do not put your name or other self-identifying marks on this document. The information you provide will be added to that of other participants for the purposes of data analysis. No groupings of data that include answers from fewer than four persons will be reported in the results of this survey.

Information collected by this means will be utilized by your organization as a guide for action planning that is designed to improve the working environment of your organization. You will be invited to participate in the analysis of the data and in developing solutions to problems identified. The data will also be used by the researcher who is monitoring the change process to assess the success or failure of change efforts.

Providing this information is voluntary, and your assistance in this effort is greatly appreciated.

Privacy Act Statement

Public Law 93-579, the Privacy Act of 1974, requires that you be informed of the purposes and uses to be made of this survey. Authority to collect this information is granted in Title 5 of the United States Code. Providing this information is voluntary. The information will be used for statistical purposes only.

TO WHAT EXTENT ...	Very Small Extent	2	Some Extent	3	4	Very Large Extent	5
1. Are you given the information you need to know to do your job in the best possible way?	1	2	3	4	5		
2. Do you have easy access to reference resources to support your normal work assignments?	1	2	3	4	5		
3. Are the decisions in this organization made at the levels where the most adequate information is available?	1	2	3	4	5		
4. When decisions are being made, are the people affected asked for their ideas?	1	2	3	4	5		
5. Do you feel motivated to contribute your best efforts to the mission and tasks of the organization?	1	2	3	4	5		
6. Are those who contribute the most to getting the job done rewarded the most?	1	2	3	4	5		
7. Does the organization have a real concern for the welfare and morale of assigned employees?	1	2	3	4	5		
8. Do you feel you understand the goals and objectives of your work group?	1	2	3	4	5		
9. Is the workload fairly distributed among the members of your work group?	1	2	3	4	5		
10. Is your immediate supervisor easy to approach to clarify work to be done?	1	2	3	4	5		
11. Are you motivated to bring problems with your work assignment to the attention of your supervisor?	1	2	3	4	5		

TO WHAT EXTENT ...	Very Small Extent	2	Some Extent	4	Very Large Extent
12. Does your supervisor encourage team performance in the completion of assigned work?	1	2	3	4	5
13. Does your supervisor encourage new ideas that can improve work group performance?	1	2	3	4	5
14. Does your supervisor assist you in improving your performance?	1	2	3	4	5
15. Do you feel that your immediate work group could improve its performance?	1	2	3	4	5
16. Do members of your immediate work group encourage each other to work as a team?	1	2	3	4	5
17. Are members of your work group easy to approach?	1	2	3	4	5
18. Do office-based staff work well with those who complete most of their work at another location?	1	2	3	4	5
19. Are members of your work group helpful to you in resolving work problems or conflicts?	1	2	3	4	5
20. Is the work schedule for your work group well planned?	1	2	3	4	5
21. Do company managers and supervisors display sound leadership and management skills?	1	2	3	4	5
22. Do you have confidence in your supervisor to handle difficult situations well?	1	2	3	4	5
23. How satisfied are you with your present job assignment?	1	2	3	4	5

TO WHAT EXTENT ...	Very Small Extent	2	Some Extent	4	Very Large Extent
24. How satisfied are you with your supervisor?	1	2	3	4	5
25. All things considered, how satisfied are you with this organization?	1	2	3	4	5
26. Do you feel that there is favoritism involved in the process of work assignments?	1	2	3	4	5
27. Does your work assignment give you a sense of achievement?	1	2	3	4	5
28. Does your supervisor regularly recognize those who perform well?	1	2	3	4	5
29. Have you been adequately trained to perform the technical aspects of your job?	1	2	3	4	5
30. Do you have a fair opportunity for promotion?	1	2	3	4	5
31. Do you feel that you receive appropriate financial compensation based on your job assignment and performance?	1	2	3	4	5
32. Are people at higher levels of your organization aware of problems at your level?	1	2	3	4	5
33. Are there problems relating to race or culture within your organization?	1	2	3	4	5
34. Are there problems relating to gender relations within your organization?	1	2	3	4	5
35. Do you receive a fair and objective evaluation of your performance?	1	2	3	4	5

TO WHAT EXTENT ...	Very Small Extent	2	Some Extent	4	Very Large Extent
36. Do you feel that you have an equal opportunity for obtaining training and educational assistance?	1	2	3	4	5
37. Do you usually have the equipment and supplies you need to complete your assigned work?	1	2	3	4	5
38. Do you feel challenged by your work assignment?	1	2	3	4	5
39. Is safety given a high priority by members of your work group?	1	2	3	4	5
40. Are the deadlines for completion of your work realistic?	1	2	3	4	5
41. Do you routinely feel that you must go through "red tape" to get things done?	1	2	3	4	5
42. Are innovative ideas encouraged within the organization?	1	2	3	4	5
43. Are individual talents taken into account when work assignments are made?	1	2	3	4	5
44. Is the open discussion of conflict encouraged by your supervisor?	1	2	3	4	5
45. Would you find it helpful to you to better understand career patterns and choices within LargeFirm?	1	2	3	4	5
46. Would you benefit from the formal assignment of a mentor?	1	2	3	4	5
47. Do you take pride in being a member of this organization?	1	2	3	4	5
48. Does this organization make a strong effort to recognize family concerns?	1	2	3	4	5

TO WHAT EXTENT ...	Very Small Extent		Some Extent		Very Large Extent
49. Do you enjoy your work most of the time?	1	2	3	4	5
50. Are communications between all San Diego personnel effective?	1	2	3	4	5
51. Could the overall performance of the San Diego office of LargeFirm be improved?	1	2	3	4	5
52. Do different work groups routinely communicate regarding their work assignments/accomplishments?	1	2	3	4	5
53. Do San Diego LargeFirm personnel possess strong technical skills in their respective work areas?	1	2	3	4	5
54. Do those who work on-site (away from the S.D. main office) possess strong <u>business</u> skills?	1	2	3	4	5
55. Do those who work in the S.D. main office possess strong <u>business</u> skills?	1	2	3	4	5
56. Does the S.D. main office provide adequate computer hardware and software to support your work assignments?	1	2	3	4	5
57. Are the facilities where you perform the majority of your work adequate?	1	2	3	4	5
58. Do you understand the business directions established for the San Diego office of LargeFirm?	1	2	3	4	5
59. Would you like to participate in planning future San Diego business objectives?	1	2	3	4	5

TO WHAT EXTENT ...	Very Small Extent		Some Extent		Very Large Extent
60. Is corporate-provided training adequate to assist you in achieving your career goals?	1	2	3	4	5
61. Does your work give you a strong sense of achievement?	1	2	3	4	5
62. Do the senior members of the local office set examples when it comes to high quality performance?	1	2	3	4	5
63. Do you feel that you will look for employment elsewhere during the next year?	1	2	3	4	5
64. If you had the opportunity to change one thing within your organization to improve it, what would you change?					
65. What do you enjoy the most about working for the San Diego office of LargeFirm?					

66. I am ___ male ___ female.
67. I would like to establish a long-term career with LargeFirm.
___ yes ___ no
68. I work mainly at
___ the San Diego main office ___ another location
69. In age I am
___ less than 30 ___ 30 but less than 40
___ 40 but less than 50 ___ 50 or older
70. I have worked for LargeFirm for
___ less than 6 months ___ 6 months to 2 years
___ greater than 2 years
71. The majority of my work would be classified as:
___ technical ___ management/supervision ___ admin support
___ other

APPENDIX E
CAREER INFORMATION QUESTIONNAIRE

This survey is reproduced from one contained in the Career Information Program Manager's Guide printed in 1981 by the COMNAVAIRPAC Retention Team. It was developed specifically to support retention improvement efforts underway at that time.

CAREER INFORMATION QUESTIONNAIRE

THE PURPOSE OF THIS QUESTIONNAIRE IS TO OBJECTIVELY EVALUATE YOUR CAREER INFORMATION PROGRAM TO ENSURE THAT YOU ARE GETTING THE COUNSELING AND ASSISTANCE YOU REQUIRE TO UNDERSTAND AND TO TAKE ADVANTAGE OF THE MANY OPPORTUNITIES AVAILABLE IN THE NAVY TODAY.

NO NAMES ARE TO BE USED TO ENABLE YOU TO BE AS CANDID AND OBJECTIVE AS POSSIBLE ON YOUR ANSWERS.

YOUR ASSISTANCE IN COMPLETING THIS QUESTIONNAIRE WILL HELP US IN DEVELOPING BETTER AND MORE PRODUCTIVE PROGRAMS FOR YOU AND YOUR SHIPMATES.

REMEMBER: MARK THE ANSWER THAT BEST APPLIES TO YOU. BE HONEST. IF YOU DON'T KNOW, THEN MARK "NO" AS YOUR ANSWER.

DO NOT WRITE IN THIS BOOKLET FOR ANY REASON!!!!

MARK ALL ANSWERS ON THE ANSWER SHEET PROVIDED.

(GO ON TO NEXT PAGE)

CAREER INFORMATION QUESTIONNAIRE

1. DO YOU KNOW WHO YOUR COMMAND CAREER COUNSELOR IS?
2. HAVE YOU RECEIVED COUNSELING OR BRIEFING FROM THE COMMAND CAREER COUNSELOR WITHIN THE LAST 12 MONTHS?
3. IS YOUR COMMAND CAREER COUNSELOR AVAILABLE TO ASSIST YOU WITH CAREER PROBLEMS NOT RESOLVED AT THE DIVISION LEVEL?
4. HAVE YOU SUBMITTED AN ENLISTED DUTY PREFERENCE (NAVPERS 1306/63) SINCE REPORTING TO THIS COMMAND?
5. DID YOU RECEIVE COUNSELING AND/OR ASSISTANCE IN FILLING OUT YOUR ENLISTED DUTY PREFERENCE (NAVPERS 1306/63)?
6. HOW INFORMED DO YOU FEEL YOUR COMMAND CAREER COUNSELOR IS?
 - A. WELL INFORMED
 - B. POORLY INFORMED
 - C. DO NOT KNOW
7. SINCE REPORTING TO YOUR DIVISION, HAVE YOU RECEIVED INDIVIDUAL OR GROUP COUNSELING IN THE FOLLOWING AREA:
(ANSWER EACH OF THE BELOW)
 - A. CAREER BENEFITS IN THE NAVY
 - B. INFORMATION TO IMPROVE YOUR PROFESSIONAL DEVELOPMENT IN THE NAVY
 - C. INFORMATION ON THE GUARD III PROGRAM
 - D. INFORMATION ON THE STAR/SCORE PROGRAMS
8. DO YOU KNOW WHO YOUR DIVISION CAREER COUNSELOR IS?
9. IS YOUR DIVISION CAREER COUNSELOR AVAILABLE TO ASSIST YOU DURING YOUR NORMAL WORKING HOURS?
10. HOW WELL INFORMED TO YOU FEEL YOUR DIVISION CAREER COUNSELOR IS?
 - A. WELL INFORMED
 - B. POORLY INFORMED
 - C. DO NOT KNOW
11. DOES YOUR SUPERVISOR AND/OR DIVISION OFFICER PROVIDE YOU WITH CURRENT INFORMATION ABOUT YOUR COMMAND AND ITS OPERATIONAL FUNCTIONS?

12. DO YOU FEEL THE PLAN OF THE DAY PROVIDES YOU WITH THE NECESSARY INFORMATION TO KEEP YOURSELF WELL INFORMED?

13. DOES YOUR DEPARTMENT HAVE A RETENTION BULLETIN BOARD?

IF YOU ANSWER "NO" TO QUESTION #13, GO TO QUESTION #15.

14. HAVE YOU READ THIS BULLETIN BOARD IN THE LAST SIX MONTHS?

15. DO YOU KNOW WHO YOUR COMMAND MASTER CHIEF IS?

16. WITHIN 30 DAYS OF REPORTING TO THIS COMMAND DID YOU RECEIVE A PERSONAL INTERVIEW FROM EACH OF THE FOLLOWING:

- A. YOUR DIVISION OFFICER
- B. YOUR DIVISION SUPERVISOR
- C. YOUR DIVISION CAREER COUNSELOR
- D. YOUR COMMAND CAREER COUNSELOR

17. IF YOU HAD A MAJOR PROBLEM, WHICH OF THE FOLLOWING WOULD YOU MOST LIKELY SEEK OUT FOR ADVICE?

- A. YOUR DIVISION OFFICER
- B. YOUR DIVISION SUPERVISOR
- C. YOUR IMMEDIATE SUPERVISOR
- D. NONE OF THE ABOVE

18. DID YOU RECEIVE A SPONSORSHIP LETTER OR MESSAGE PRIOR TO REPORTING TO THIS COMMAND?

19. DID YOUR SPONSOR ASSIST YOU IN GETTING SETTLED IN THIS COMMAND AND LOCAL AREA?

20. DID YOU RECEIVE A COMMAND INDOCTRINATION BRIEFING WITHIN 60 DAYS AFTER REPORTING TO THIS COMMAND?

21. DOES YOUR COMMAND HAVE A PROFESSIONAL DEVELOPMENT BOARD?

IF YOU ANSWERED NO TO THE LAST QUESTION, GO TO QUESTION #23.

22. IS THE COMMAND'S PROFESSIONAL DEVELOPMENT BOARD EFFECTIVE IN HELPING THE INDIVIDUAL ATTAIN HIS/HER GOALS?

23. BASED ON YOUR PRESENT KNOWLEDGE LEVEL, YOUR COMMAND'S PROFESSIONAL DEVELOPMENT BOARD IS DESIGNED TO ASSIST:

- A. NON-RATED, NON-DESIGNATED ONLY
- B. PAYGRADE E-6 AND BELOW HAVING DIFFICULTY ADVANCING IN RATE ONLY
- C. E-6 THROUGH E-8 PASSED OVER FOR SELECTION E-7, E-8 OR E-9 ONLY
- D. ALL OF THE ABOVE

24. SINCE REPORTING TO YOUR COMMAND, HAVE YOU RECEIVED INDIVIDUAL OR GROUP COUNSELING IN THE FOLLOWING AREAS:

(ANSWER EACH OF THE FOLLOWING)

- A. ADVANCEMENT
- B. GED OR HIGH SCHOOL PROGRAMS
- C. OFF-DUTY EDUCATIONAL OPPORTUNITIES
- D. NAVY EDUCATIONAL OPPORTUNITIES

25. DOES YOUR COMMAND HAVE AN OMBUDSMAN?

26. HAS YOUR SPOUSE EVER BEEN CONTACTED BY THE COMMAND'S OMBUDSMAN?

27. WOULD YOU LIKE YOUR SPOUSE TO BE CONTACTED BY THE COMMAND'S OMBUDSMAN?

IF YOU HAVE NOT RECEIVED AN EVALUATION AT THIS COMMAND GO TO QUESTION #30

28. WERE YOU COUNSELED ON YOUR LAST PERFORMANCE EVALUATION BY THE FOLLOWING:

(ANSWER ALL OF THE BELOW)

- A. DIVISION OFFICER
- B. LEADING CHIEF PETTY OFFICER
- C. LEADING PETTY OFFICER
- D. NONE OF THE ABOVE

29. DO YOU FEEL YOU WERE FAIRLY EVALUATED ON YOUR LAST PERFORMANCE EVALUATION?

30. MY PRESENT CAREER INTENTIONS ARE:
- A. REENLIST OR EXTEND AT EAOS
 - B. UNDECIDED AT PRESENT
 - C. RETURN TO CIVILIAN LIFE
 - D. GO TO FLEET RESERVE/RETIREMENT

(STOP - END OF QUESTIONNAIRE)

APPENDIX F
LARFIRM EXAMPLE DATA

Summaries of Q6
By levels of SEX

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			2.9298	1.0833	57
SEX	1		3.0244	1.0121	41
SEX	2		2.6875	1.2500	16
Total Cases =			68		
Missing Cases =			11 OR 16.2 PCT.		

Summaries of Q6
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			2.9298	1.0833	57
AGE	1		3.0000	1.2247	9
AGE	2		2.5714	1.0894	14
AGE	3		2.8125	.9106	16
AGE	4		3.2778	1.1275	18
Total Cases =			68		
Missing Cases =			11 OR 16.2 PCT.		

Summaries of Q6
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			2.9298	1.0833	57
WORK	1		2.8462	.8806	26
WORK	2		3.7333	1.0328	15
WORK	3		2.1818	.8739	11
WORK	4		3.0000	1.1547	4
WORK	9		1.0000	.0000	1
Total Cases =			68		
Missing Cases =			11 OR 16.2 PCT.		

Summaries of Q7
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.8154	1.0737	65
WORK	1		3.7273	.9445	33
WORK	2		4.4667	1.0601	15
WORK	3		3.7000	.9487	10
WORK	4		3.3333	1.0328	6
WORK	9		1.0000	.0000	1
Total Cases =		68			
Missing Cases =		3 OR	4.4 PCT.		

Summaries of Q8
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			4.1667	.9541	66
WORK	1		4.1176	.9460	34
WORK	2		4.6667	.4880	15
WORK	3		4.0000	.8944	11
WORK	4		3.5000	1.5166	6
Total Cases =		68			
Missing Cases =		2 OR	2.9 PCT.		

Summaries of Q9
By levels of LOCATION

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.5806	1.1672	62
LOCATION	1		3.2917	1.0826	24
LOCATION	2		3.8378	1.1184	37
LOCATION	3		1.0000	.0000	1

Total Cases = 68
Missing Cases = 6 OR 8.8 PCT.

Summaries of Q9
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.5806	1.1672	62
AGE	1		3.4167	1.1645	12
AGE	2		3.3750	1.2042	16
AGE	3		3.8235	1.1311	17
AGE	4		3.6471	1.2217	17

Total Cases = 68
Missing Cases = 6 OR 8.8 PCT.

Summaries of Q9
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.5806	1.1672	62
TIME	1		4.0000	1.0690	8
TIME	2		3.5789	1.1771	38
TIME	3		3.3333	1.2344	15
TIME	9		4.0000	.0000	1

Total Cases = 68
Missing Cases = 6 OR 8.8 PCT.

Summaries of Q9
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.5806	1.1672	62
WORK	1		3.7333	1.0483	30
WORK	2		3.7333	1.1629	15
WORK	3		2.9000	1.3703	10
WORK	4		3.5000	1.3784	6
WORK	9		4.0000	.0000	1

Total Cases = 68
Missing Cases = 6 OR 8.8 PCT.

Summaries of Q10
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			4.1324	1.1958	68
AGE	1		4.5000	.9405	14
AGE	2		3.2941	1.3585	17
AGE	3		4.2105	1.0317	19
AGE	4		4.5556	1.0416	18

Total Cases = 68

Summaries of Q10
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			4.1324	1.1958	68
WORK	1		4.1429	1.1917	35
WORK	2		4.6000	.9103	15
WORK	3		3.6364	1.2863	11
WORK	4		4.0000	1.5492	6
WORK	9		3.0000	.0000	1

Total Cases = 68

Summaries of Q11
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			4.0299	1.1543	67
AGE	1		4.2857	.9139	14
AGE	2		3.5625	1.3647	16
AGE	3		4.0526	.9703	19
AGE	4		4.2222	1.2628	18

Total Cases = 68
Missing Cases = 1 OR 1.5 PCT.

Summaries of Q11
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			4.0299	1.1543	67
TIME	1		4.4000	.8433	10
TIME	2		3.9750	1.1206	40
TIME	3		3.8750	1.4083	16
TIME	9		5.0000	.0000	1

Total Cases = 68
Missing Cases = 1 OR 1.5 PCT.

Summaries of Q11
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			4.0299	1.1543	67
WORK	1		3.8529	1.2585	34
WORK	2		4.7333	.4577	15
WORK	3		3.6364	1.3618	11
WORK	4		3.8333	.7528	6
WORK	9		5.0000	.0000	1

Total Cases = 68
Missing Cases = 1 OR 1.5 PCT.

Summaries of Q12
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.9677	.9576	62
AGE	1		4.1538	.8987	13
AGE	2		3.4375	1.2633	16
AGE	3		4.0588	.7475	17
AGE	4		4.2500	.6831	16
Total Cases =		68			
Missing Cases =		6 OR	8.8 PCT.		

Summaries of Q12
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.9677	.9576	62
TIME	1		4.3000	.8233	10
TIME	2		3.9211	.8817	38
TIME	3		3.8571	1.2315	14
Total Cases =		68			
Missing Cases =		6 OR	8.8 PCT.		

Summaries of Q12
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.9677	.9576	62
WORK	1		3.8387	1.0359	31
WORK	2		4.3333	.7237	15
WORK	3		4.0000	1.0541	10
WORK	4		3.6667	.8165	6
Total Cases =		68			
Missing Cases =		6 OR	8.8 PCT.		

Summaries of Q13
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.8095	1.0295	63
AGE	1		4.0000	1.0000	13
AGE	2		3.3333	1.2910	15
AGE	3		3.6111	.8498	18
AGE	4		4.2941	.7717	17

Total Cases = 68
Missing Cases = 5 OR 7.4 PCT.

Summaries of Q13
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.8095	1.0295	63
TIME	1		4.0000	.7071	9
TIME	2		3.6667	1.0345	39
TIME	3		4.0667	1.1629	15

Total Cases = 68
Missing Cases = 5 OR 7.4 PCT.

Summaries of Q13
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.8095	1.0295	63
WORK	1		3.6176	1.1014	34
WORK	2		4.4000	.7368	15
WORK	3		3.5556	1.0138	9
WORK	4		3.8000	.8367	5

Total Cases = 68
Missing Cases = 5 OR 7.4 PCT.

Summaries of Q14
By levels of SEX

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			3.3548	1.1748	62
SEX	1		3.1395	1.1666	43
SEX	2		3.8421	1.0679	19
Total Cases = 68					
Missing Cases = 6 OR 8.8 PCT.					

Summaries of Q14
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			3.3548	1.1748	62
AGE	1		3.2500	1.4848	12
AGE	2		3.0667	1.3345	15
AGE	3		3.4118	.7123	17
AGE	4		3.6111	1.1950	18
Total Cases = 68					
Missing Cases = 6 OR 8.8 PCT.					

Summaries of Q14
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			3.3548	1.1748	62
TIME	1		4.1667	1.1690	6
TIME	2		3.1795	1.1669	39
TIME	3		3.5000	1.1547	16
TIME	9		3.0000	.0000	1
Total Cases = 68					
Missing Cases = 6 OR 8.8 PCT.					

Summaries of Q14
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			3.3548	1.1748	62
WORK	1		3.0645	1.2893	31
WORK	2		4.0000	.9258	15
WORK	3		3.4000	1.0750	10
WORK	4		3.2000	.8367	5
WORK	9		3.0000	.0000	1
Total Cases = 68					
Missing Cases = 6 OR 8.8 PCT.					

Summaries of Q15
By levels of SEX

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.2295	1.2701	61
SEX	1		3.0698	1.2798	43
SEX	2		3.6111	1.1950	18

Total Cases = 68
Missing Cases = 7 OR 10.3 PCT.

Summaries of Q15
By levels of LOCATION

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.2295	1.2701	61
LOCATION	1		3.6087	1.3052	23
LOCATION	2		3.0000	1.2247	37
LOCATION	3		3.0000	.0000	1

Total Cases = 68
Missing Cases = 7 OR 10.3 PCT.

Summaries of Q15
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.2295	1.2701	61
TIME	1		2.8750	1.3562	8
TIME	2		3.0000	1.2247	37
TIME	3		3.8667	1.1255	15
TIME	9		5.0000	.0000	1

Total Cases = 68
Missing Cases = 7 OR 10.3 PCT.

Summaries of Q15
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.2295	1.2701	61
WORK	1		2.9333	1.2299	30
WORK	2		3.2000	1.3202	15
WORK	3		4.1000	.9944	10
WORK	4		3.0000	1.2247	5
WORK	9		5.0000	.0000	1

Total Cases = 68
Missing Cases = 7 OR 10.3 PCT.

Summaries of Q16
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.7460	1.1773	63
AGE	1		2.9167	1.6765	12
AGE	2		3.5000	1.1547	16
AGE	3		4.1765	.7276	17
AGE	4		4.1111	.8324	18
Total Cases =			68		
Missing Cases =			5 OR	7.4 PCT.	

Summaries of Q16
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.7460	1.1773	63
TIME	1		3.3750	1.5980	8
TIME	2		3.7105	1.1128	38
TIME	3		4.1875	.8342	16
TIME	9		1.0000	.0000	1
Total Cases =			68		
Missing Cases =			5 OR	7.4 PCT.	

Summaries of Q16
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.7460	1.1773	63
WORK	1		3.7419	1.0636	31
WORK	2		4.2000	.8619	15
WORK	3		3.4545	1.3685	11
WORK	4		3.6000	1.6733	5
WORK	9		1.0000	.0000	1
Total Cases =			68		
Missing Cases =			5 OR	7.4 PCT.	

Summaries of Q17
By levels of SEX

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			4.2188	1.0153	64
SEX	1		4.4091	.7256	44
SEX	2		3.8000	1.3992	20
Total Cases =		68			
Missing Cases =		4 OR	5.9 PCT.		

Summaries of Q17
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			4.2188	1.0153	64
TIME	1		3.4000	1.6465	10
TIME	2		4.3947	.7898	38
TIME	3		4.3125	.7932	16
Total Cases =		68			
Missing Cases =		4 OR	5.9 PCT.		

Summaries of Q17
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			4.2188	1.0153	64
WORK	1		4.4063	.7121	32
WORK	2		4.6667	.6172	15
WORK	3		3.6364	1.2863	11
WORK	4		3.1667	1.6021	6
Total Cases =		68			
Missing Cases =		4 OR	5.9 PCT.		

Summaries of Q18
By levels of CAREER

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.5345	1.0957	58
CAREER	1		3.6000	1.0646	55
CAREER	2		3.0000	.0000	2
CAREER	9		1.0000	.0000	1
Total Cases =		68			
Missing Cases =		10 OR	14.7 PCT.		

Summaries of Q18
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.5345	1.0957	58
AGE	1		3.9091	1.0445	11
AGE	2		3.0000	1.1282	12
AGE	3		3.8235	.8090	17
AGE	4		3.3889	1.2433	18
Total Cases =		68			
Missing Cases =		10 OR	14.7 PCT.		

Summaries of Q19
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.8125	1.0672	64
AGE	1		3.3077	1.4367	13
AGE	2		3.8750	1.0247	16
AGE	3		3.8824	.9275	17
AGE	4		4.0556	.8726	18
Total Cases =			68		
Missing Cases =			4 OR	5.9 PCT.	

Summaries of Q19
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.8125	1.0672	64
TIME	1		3.4444	1.5899	9
TIME	2		3.9474	.9571	38
TIME	3		3.8125	.9106	16
TIME	9		2.0000	.0000	1
Total Cases =			68		
Missing Cases =			4 OR	5.9 PCT.	

Summaries of Q19
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.8125	1.0672	64
WORK	1		3.8438	.9873	32
WORK	2		4.4000	.6325	15
WORK	3		3.5000	.9718	10
WORK	4		3.0000	1.6733	6
WORK	9		2.0000	.0000	1
Total Cases =			68		
Missing Cases =			4 OR	5.9 PCT.	

Summaries of Q21
By levels of LOCATION

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
LOCATION	1		3.2917	1.3667	24
LOCATION	2		3.8537	.8533	41

Total Cases = 68
Missing Cases = 3 OR 4.4 PCT.

Summaries of Q21
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
AGE	1		3.7273	1.1909	11
AGE	2		3.2941	.9852	17
AGE	3		3.7368	1.0976	19
AGE	4		3.8333	1.1504	18

Total Cases = 68
Missing Cases = 3 OR 4.4 PCT.

Summaries of Q21
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
TIME	1		4.0000	.9428	10
TIME	2		3.6316	1.0246	38
TIME	3		3.5000	1.3663	16
TIME	9		3.0000	.0000	1

Total Cases = 68
Missing Cases = 3 OR 4.4 PCT.

Summaries of Q21
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
WORK	1		3.6176	1.1810	34
WORK	2		4.2000	.7746	15
WORK	3		2.9000	.9944	10
WORK	4		3.8000	.8367	5
WORK	9		3.0000	.0000	1

Total Cases = 68
Missing Cases = 3 OR 4.4 PCT.

Summaries of Q22
By levels of LOCATION

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			3.9697	1.2645	66
LOCATION	1		3.6522	1.5843	23
LOCATION	2		4.1190	1.0407	42
LOCATION	3		5.0000	.0000	1
Total Cases = 68					
Missing Cases = 2 OR 2.9 PCT.					

Summaries of Q22
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			3.9697	1.2645	66
AGE	1		4.3077	1.1821	13
AGE	2		3.1875	1.4245	16
AGE	3		4.1579	1.0679	19
AGE	4		4.2222	1.1660	18
Total Cases = 68					
Missing Cases = 2 OR 2.9 PCT.					

Summaries of Q22
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			3.9697	1.2645	66
TIME	1		4.5556	.5270	9
TIME	2		4.0250	1.2297	40
TIME	3		3.5625	1.5478	16
TIME	9		3.0000	.0000	1
Total Cases = 68					
Missing Cases = 2 OR 2.9 PCT.					

Summaries of Q22
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			3.9697	1.2645	66
WORK	1		3.8286	1.3170	35
WORK	2		4.6667	.7237	15
WORK	3		3.5000	1.6499	10
WORK	4		4.0000	.7071	5
WORK	9		3.0000	.0000	1
Total Cases = 68					
Missing Cases = 2 OR 2.9 PCT.					

Summaries of Q23
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.9118	1.0891	68
WORK	1		3.9143	1.2217	35
WORK	2		4.4000	.6325	15
WORK	3		3.4545	1.0357	11
WORK	4		3.8333	.7528	6
WORK	9		2.0000	.0000	1

Total Cases = 68

Summaries of Q24
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			4.0147	1.2277	68
AGE	1		4.3571	1.1507	14
AGE	2		3.3529	1.4116	17
AGE	3		4.0526	1.1291	19
AGE	4		4.3333	1.0290	18

Total Cases = 68

Summaries of Q24
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			4.0147	1.2277	68
TIME	1		4.4545	.6876	11
TIME	2		4.1000	1.1723	40
TIME	3		3.5625	1.5478	16
TIME	9		3.0000	.0000	1

Total Cases = 68

Summaries of Q24
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			4.0147	1.2277	68
WORK	1		3.9143	1.3144	35
WORK	2		4.6667	.8165	15
WORK	3		3.5455	1.3685	11
WORK	4		4.0000	.8944	6
WORK	9		3.0000	.0000	1

Total Cases = 68

Summaries of Q25
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			4.0606	.9094	66
TIME	1		4.5556	.5270	9
TIME	2		4.0500	.9594	40
TIME	3		3.8750	.8851	16
TIME	9		3.0000	.0000	1
Total Cases =		68			
Missing Cases =		2 OR	2.9 PCT.		

Summaries of Q25
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			4.0606	.9094	66
WORK	1		3.9706	1.0585	34
WORK	2		4.5333	.5164	15
WORK	3		3.9000	.7379	10
WORK	4		3.8333	.7528	6
WORK	9		3.0000	.0000	1
Total Cases =		68			
Missing Cases =		2 OR	2.9 PCT.		

Summaries of Q26
By levels of LOCATION

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			2.1587	1.4392	63
LOCATION	1		2.5417	1.6676	24
LOCATION	2		1.8947	1.2475	38
LOCATION	3		3.0000	.0000	1

Total Cases = 68
Missing Cases = 5 OR 7.4 PCT.

Summaries of Q26
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			2.1587	1.4392	63
AGE	1		1.7500	.9653	12
AGE	2		2.6875	1.8154	16
AGE	3		2.0000	1.3693	17
AGE	4		2.1111	1.3672	18

Total Cases = 68
Missing Cases = 5 OR 7.4 PCT.

Summaries of Q26
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			2.1587	1.4392	63
TIME	1		1.5000	1.0690	8
TIME	2		2.0526	1.3744	38
TIME	3		2.8125	1.6008	16
TIME	9		1.0000	.0000	1

Total Cases = 68
Missing Cases = 5 OR 7.4 PCT.

Summaries of Q26
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			2.1587	1.4392	63
WORK	1		2.0333	1.4499	30
WORK	2		1.9333	1.3345	15
WORK	3		3.0909	1.5136	11
WORK	4		1.8333	1.1690	6
WORK	9		1.0000	.0000	1

Total Cases = 68
Missing Cases = 5 OR 7.4 PCT.

Summaries of Q27
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.7273	1.0748	66
WORK	1		3.6364	1.1677	33
WORK	2		4.3333	.7237	15
WORK	3		3.5455	.9342	11
WORK	4		3.3333	1.0328	6
WORK	9		2.0000	.0000	1
Total Cases =			68		
Missing Cases =			2 OR	2.9 PCT.	

Summaries of Q28
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.4426	1.1906	61
AGE	1		3.8182	.7508	11
AGE	2		2.8125	1.3276	16
AGE	3		3.4706	1.1246	17
AGE	4		3.7647	1.2005	17
Total Cases =			68		
Missing Cases =			7 OR	10.3 PCT.	

Summaries of Q28
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.4426	1.1906	61
WORK	1		3.1613	1.1859	31
WORK	2		4.1333	.7432	15
WORK	3		3.4444	1.5899	9
WORK	4		3.4000	.8944	5
WORK	9		2.0000	.0000	1
Total Cases =			68		
Missing Cases =			7 OR	10.3 PCT.	

Summaries of Q29
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.9385	.9663	65
AGE	1		3.7500	.9653	12
AGE	2		3.6471	.7859	17
AGE	3		4.1111	1.0226	18
AGE	4		4.1667	1.0432	18
Total Cases =			68		
Missing Cases =			3 OR	4.4 PCT.	

Summaries of Q29
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.9385	.9663	65
TIME	1		3.5556	.7265	9
TIME	2		4.0256	1.0127	39
TIME	3		3.9375	.9979	16
TIME	9		4.0000	.0000	1
Total Cases =			68		
Missing Cases =			3 OR	4.4 PCT.	

Summaries of Q29
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.9385	.9663	65
WORK	1		3.9688	1.0621	32
WORK	2		4.1333	.8338	15
WORK	3		3.6364	1.0269	11
WORK	4		3.8333	.7528	6
WORK	9		4.0000	.0000	1
Total Cases =			68		
Missing Cases =			3 OR	4.4 PCT.	

Summaries of Q30
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.2963	1.1431	54
WORK	1		2.9231	1.0554	26
WORK	2		4.2143	.6993	14
WORK	3		3.1111	1.1667	9
WORK	4		3.0000	1.4142	5

Total Cases = 68
Missing Cases = 14 OR 20.6 PCT.

Summaries of Q31
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.5469	1.2840	64
AGE	1		3.5833	1.0836	12
AGE	2		2.9333	1.4376	15
AGE	3		3.4737	1.1723	19
AGE	4		4.1111	1.2314	18

Total Cases = 68
Missing Cases = 4 OR 5.9 PCT.

Summaries of Q31
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.5469	1.2840	64
TIME	1		4.2857	.4880	7
TIME	2		3.5750	1.2380	40
TIME	3		3.1875	1.5586	16
TIME	9		3.0000	.0000	1

Total Cases = 68
Missing Cases = 4 OR 5.9 PCT.

Summaries of Q31
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.5469	1.2840	64
WORK	1		3.6250	1.1846	32
WORK	2		4.0667	1.0998	15
WORK	3		2.5000	1.4337	10
WORK	4		3.6667	1.3663	6
WORK	9		3.0000	.0000	1

Total Cases = 68
Missing Cases = 4 OR 5.9 PCT.

Summaries of Q32
By levels of SEX

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.0893	1.2831	56
SEX	1		3.2750	1.2401	40
SEX	2		2.6250	1.3102	16

Total Cases = 68
Missing Cases = 12 OR 17.6 PCT.

Summaries of Q32
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.0893	1.2831	56
AGE	1		2.2500	1.3887	8
AGE	2		2.6154	1.2609	13
AGE	3		3.5882	.7123	17
AGE	4		3.3333	1.4552	18

Total Cases = 68
Missing Cases = 12 OR 17.6 PCT.

Summaries of Q32
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.0893	1.2831	56
TIME	1		2.8000	1.3038	5
TIME	2		3.2647	1.3328	34
TIME	3		2.9375	1.1236	16
TIME	9		1.0000	.0000	1

Total Cases = 68
Missing Cases = 12 OR 17.6 PCT.

Summaries of Q32
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.0893	1.2831	56
WORK	1		2.7917	1.1413	24
WORK	2		4.1333	.9904	15
WORK	3		2.8000	1.3984	10
WORK	4		2.5000	.8367	6
WORK	9		1.0000	.0000	1

Total Cases = 68
Missing Cases = 12 OR 17.6 PCT.

Summaries of Q33
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			1.1290	.4611	62
WORK	1		1.0645	.3592	31
WORK	2		1.0000	.0000	15
WORK	3		1.4000	.8433	10
WORK	4		1.4000	.5477	5
WORK	9		1.0000	.0000	1

Total Cases = 68
Missing Cases = 6 OR 8.8 PCT.

Summaries of Q34
By levels of SEX

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			1.3770	.7781	61
SEX	1		1.2439	.6237	41
SEX	2		1.6500	.9881	20

Total Cases = 68
Missing Cases = 7 OR 10.3 PCT.

Summaries of Q34
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			1.3770	.7781	61
AGE	1		1.6364	1.1201	11
AGE	2		1.6250	1.0247	16
AGE	3		1.2941	.4697	17
AGE	4		1.0588	.2425	17

Total Cases = 68
Missing Cases = 7 OR 10.3 PCT.

Summaries of Q34
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			1.3770	.7781	61
WORK	1		1.1034	.4093	29
WORK	2		1.2667	.4577	15
WORK	3		2.1000	1.2867	10
WORK	4		1.8333	.9832	6
WORK	9		1.0000	.0000	1

Total Cases = 68
Missing Cases = 7 OR 10.3 PCT.

Summaries of Q35
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.8966	1.1033	58
AGE	1		4.2222	.6667	9
AGE	2		3.3571	1.2157	14
AGE	3		3.7647	1.0914	17
AGE	4		4.2778	1.0741	18

Total Cases = 68
Missing Cases = 10 OR 14.7 PCT.

Summaries of Q35
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.8966	1.1033	58
TIME	1		3.0000	1.4142	2
TIME	2		4.0769	.8074	39
TIME	3		3.7500	1.4376	16
TIME	9		1.0000	.0000	1

Total Cases = 68
Missing Cases = 10 OR 14.7 PCT.

Summaries of Q35
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.8966	1.1033	58
WORK	1		3.9643	.9616	28
WORK	2		4.4000	.9103	15
WORK	3		3.5000	1.2693	10
WORK	4		3.2500	.9574	4
WORK	9		1.0000	.0000	1

Total Cases = 68
Missing Cases = 10 OR 14.7 PCT.

Summaries of Q36
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			4.1538	.9054	65
AGE	1		4.4286	.6462	14
AGE	2		4.0000	.9661	16
AGE	3		4.1053	.8093	19
AGE	4		4.1250	1.1475	16
Total Cases =		68			
Missing Cases =		3 OR	4.4 PCT.		

Summaries of Q36
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			4.1538	.9054	65
WORK	1		4.0625	.8776	32
WORK	2		4.6667	.6172	15
WORK	3		4.1818	.9816	11
WORK	4		3.5000	1.0488	6
WORK	9		3.0000	.0000	1
Total Cases =		68			
Missing Cases =		3 OR	4.4 PCT.		

Summaries of Q37
By levels of SEX

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.8824	1.1785	68
SEX	1		3.7174	1.2049	46
SEX	2		4.2273	1.0660	22
Total Cases =					68

Summaries of Q37
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.8824	1.1785	68
AGE	1		4.5000	.9405	14
AGE	2		3.8824	1.0537	17
AGE	3		3.6316	1.3421	19
AGE	4		3.6667	1.1882	18
Total Cases =					68

Summaries of Q37
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.8824	1.1785	68
WORK	1		3.7429	1.2682	35
WORK	2		4.2000	.7746	15
WORK	3		3.8182	1.4013	11
WORK	4		4.0000	1.2649	6
WORK	9		4.0000	.0000	1
Total Cases =					68

Summaries of Q38
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.5735	1.1239	68
WORK	1		3.5429	1.1464	35
WORK	2		4.3333	.9759	15
WORK	3		3.0909	.8312	11
WORK	4		3.0000	.8944	6
WORK	9		2.0000	.0000	1
Total Cases =					68

Summaries of Q39

By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.7069	1.1395	58
TIME	1		3.5000	1.4142	8
TIME	2		3.6389	1.1748	36
TIME	3		4.0769	.8623	13
TIME	9		3.0000	.0000	1
Total Cases =					68
Missing Cases =					10 OR 14.7 PCT.

Summaries of Q42
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.6230	.9516	61
WORK	1		3.5484	.9946	31
WORK	2		4.2667	.7037	15
WORK	3		3.0000	.8165	10
WORK	4		3.4000	.5477	5
Total Cases =			68		
Missing Cases =			7 OR	10.3 PCT.	

Summaries of Q43
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.6271	1.1582	59
WORK	1		3.5333	1.1059	30
WORK	2		4.2667	.9612	15
WORK	3		3.3000	1.3375	10
WORK	4		2.7500	.9574	4
Total Cases =			68		
Missing Cases =			9 OR	13.2 PCT.	

Summaries of Q48
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			4.0508	1.0073	59
TIME	1		3.6667	1.6330	6
TIME	2		4.0270	.9276	37
TIME	3		4.2500	.9309	16

Total Cases = 68
Missing Cases = 9 OR 13.2 PCT.

Summaries of Q49
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			4.1194	.9132	67
WORK	1		3.9714	1.0428	35
WORK	2		4.5333	.5164	15
WORK	3		4.0909	.9439	11
WORK	4		4.0000	.7071	5
WORK	9		4.0000	.0000	1

Total Cases = 68
Missing Cases = 1 OR 1.5 PCT.

Summaries of Q56
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.5319	1.3489	47
WORK	1		3.1818	1.4019	22
WORK	2		4.0769	1.3205	13
WORK	3		3.7778	.9718	9
WORK	4		3.0000	1.7321	3

Total Cases = 68
Missing Cases = 21 OR 30.9 PCT.

Summaries of Q57
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			4.1493	.8573	67
TIME	1		4.2000	.7888	10
TIME	2		4.0000	.9608	40
TIME	3		4.5000	.5164	16
TIME	9		4.0000	.0000	1

Total Cases = 68
Missing Cases = 1 OR 1.5 PCT.

Summaries of Q57
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			4.1493	.8573	67
WORK	1		4.0000	.9701	35
WORK	2		4.6000	.6325	15
WORK	3		4.0000	.6325	11
WORK	4		4.2000	.8367	5
WORK	9		4.0000	.0000	1

Total Cases = 68
Missing Cases = 1 OR 1.5 PCT.

Summaries of Q38
By levels of SEX

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.5735	1.1239	68
SEX	1		3.7174	1.1287	46
SEX	2		3.2727	1.0771	22
Total Cases =					68

Summaries of Q38
By levels of LOCATION

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.5735	1.1239	68
LOCATION	1		3.8333	1.1672	24
LOCATION	2		3.4651	1.0768	43
LOCATION	3		2.0000	.0000	1
Total Cases =					68

Summaries of Q38
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.5735	1.1239	68
AGE	1		3.2857	1.3828	14
AGE	2		3.5294	1.0073	17
AGE	3		3.8421	.9582	19
AGE	4		3.5556	1.1991	18
Total Cases =					68

Summaries of Q38
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.5735	1.1239	68
TIME	1		3.3636	.9244	11
TIME	2		3.4750	1.2192	40
TIME	3		4.0625	.8539	16
TIME	9		2.0000	.0000	1
Total Cases =					68

Summaries of Q40
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.5161	1.0976	62
AGE	1		3.9091	.9439	11
AGE	2		3.4000	1.0556	15
AGE	3		3.5556	1.1490	18
AGE	4		3.3333	1.1882	18

Total Cases = 68
Missing Cases = 6 OR 8.8 PCT.

Summaries of Q40
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.5161	1.0976	62
TIME	1		4.1667	.7528	6
TIME	2		3.6410	1.0127	39
TIME	3		3.0000	1.2649	16
TIME	9		3.0000	.0000	1

Total Cases = 68
Missing Cases = 6 OR 8.8 PCT.

Summaries of Q41
By levels of LOCATION

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			2.6441	1.3230	59
LOCATION	1		3.0000	1.4460	23
LOCATION	2		2.4571	1.1966	35
LOCATION	3		1.0000	.0000	1

Total Cases = 68
Missing Cases = 9 OR 13.2 PCT.

Summaries of Q41
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			2.6441	1.3230	59
WORK	1		2.4138	1.3501	29
WORK	2		2.9333	1.3345	15
WORK	3		3.0000	1.3333	10
WORK	4		2.4000	1.1402	5

Total Cases = 68
Missing Cases = 9 OR 13.2 PCT.

Summaries of Q44
By levels of SEX

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			3.1167	1.2768	60
SEX	1		3.3171	1.2132	41
SEX	2		2.6842	1.3355	19

Total Cases = 68
Missing Cases = 8 OR 11.8 PCT.

Summaries of Q44
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			3.1167	1.2768	60
AGE	1		3.7273	1.1037	11
AGE	2		2.1333	1.1872	15
AGE	3		3.1250	1.1475	16
AGE	4		3.5556	1.1490	18

Total Cases = 68
Missing Cases = 8 OR 11.8 PCT.

Summaries of Q44
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			3.1167	1.2768	60
TIME	1		2.8333	1.3292	6
TIME	2		3.3784	1.2327	37
TIME	3		2.7500	1.2383	16
TIME	9		1.0000	.0000	1

Total Cases = 68
Missing Cases = 8 OR 11.8 PCT.

Summaries of Q44
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			3.1167	1.2768	60
WORK	1		3.1481	1.2921	27
WORK	2		3.8000	1.0142	15
WORK	3		2.6364	1.2863	11
WORK	4		2.5000	1.0488	6
WORK	9		1.0000	.0000	1

Total Cases = 68
Missing Cases = 8 OR 11.8 PCT.

Summaries of Q45
By levels of LOCATION

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			3.6557	1.3024	61
LOCATION	1		3.1429	1.2762	21
LOCATION	2		3.8974	1.2523	39
LOCATION	3		5.0000	.0000	1

Total Cases = 68
Missing Cases = 7 OR 10.3 PCT.

Summaries of Q45
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			3.6557	1.3024	61
AGE	1		4.0769	1.0377	13
AGE	2		3.9375	.9979	16
AGE	3		3.2778	1.4473	18
AGE	4.		3.4286	1.5549	14

Total Cases = 68
Missing Cases = 7 OR 10.3 PCT.

Summaries of Q45
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			3.6557	1.3024	61
TIME	1		4.1111	.9280	9
TIME	2		3.6923	1.2805	39
TIME	3		3.2308	1.5359	13

Total Cases = 68
Missing Cases = 7 OR 10.3 PCT.

Summaries of Q45
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			3.6557	1.3024	61
WORK	1		4.0667	1.1427	30
WORK	2		2.5000	1.4005	14
WORK	3		3.7273	1.0090	11
WORK	4		4.1667	.7528	6

Total Cases = 68
Missing Cases = 7 OR 10.3 PCT.

Summaries of Q46
By levels of SEX

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			2.4151	1.1999	53
SEX	1		2.2821	1.2343	39
SEX	2		2.7857	1.0509	14

Total Cases = 68
Missing Cases = 15 OR 22.1 PCT.

Summaries of Q46
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			2.4151	1.1999	53
AGE	1		3.0000	1.2910	7
AGE	2		2.8571	1.0995	14
AGE	3		2.1667	1.2005	18
AGE	4		2.0000	1.1094	14

Total Cases = 68
Missing Cases = 15 OR 22.1 PCT.

Summaries of Q46
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			2.4151	1.1999	53
TIME	1		3.1667	1.3292	6
TIME	2		2.2000	1.0792	35
TIME	3		2.6667	1.3707	12

Total Cases = 68
Missing Cases = 15 OR 22.1 PCT.

Summaries of Q46
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			2.4151	1.1999	53
WORK	1		2.3333	1.1435	27
WORK	2		1.8333	1.1934	12
WORK	3		3.1000	1.2867	10
WORK	4		3.0000	.0000	4

Total Cases = 68
Missing Cases = 15 OR 22.1 PCT.

Summaries of Q50
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.1639	1.2135	61
AGE	1		3.6000	1.2649	10
AGE	2		2.6667	1.2344	15
AGE	3		3.3158	1.2496	19
AGE	4		3.1765	1.0744	17

Total Cases = 68
Missing Cases = 7 OR 10.3 PCT.

Summaries of Q50
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.1639	1.2135	61
TIME	1		3.7143	1.1127	7
TIME	2		3.2632	1.2452	38
TIME	3		2.6667	1.1127	15
TIME	9		3.0000	.0000	1

Total Cases = 68
Missing Cases = 7 OR 10.3 PCT.

Summaries of Q50
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.1639	1.2135	61
WORK	1		3.1935	1.3018	31
WORK	2		3.5333	1.1255	15
WORK	3		2.8000	1.2293	10
WORK	4		2.5000	.5774	4
WORK	9		3.0000	.0000	1

Total Cases = 68
Missing Cases = 7 OR 10.3 PCT.

Summaries of Q51
By levels of LOCATION

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.1803	1.2584	61
LOCATION	1		3.7083	1.1221	24
LOCATION	2		2.8611	1.2456	36
LOCATION	3		2.0000	.0000	1

Total Cases = 68
Missing Cases = 7 OR 10.3 PCT.

Summaries of Q51
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.1803	1.2584	61
TIME	1		2.7500	1.2817	8
TIME	2		3.0278	1.1585	36
TIME	3		3.8750	1.2042	16
TIME	9		1.0000	.0000	1

Total Cases = 68
Missing Cases = 7 OR 10.3 PCT.

Summaries of Q52
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			2.4677	1.1835	62
AGE	1		3.0909	1.4460	11
AGE	2		2.3125	1.0782	16
AGE	3		2.1765	1.0744	17
AGE	4		2.5000	1.1504	18

Total Cases = 68
Missing Cases = 6 OR 8.8 PCT.

Summaries of Q54
By levels of SEX

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.1600	.9765	50
SEX	1		2.9167	.9673	36
SEX	2		3.7857	.6993	14

Total Cases = 68
Missing Cases = 18 OR 26.5 PCT.

Summaries of Q54
By levels of LOCATION

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.1600	.9765	50
LOCATION	1		2.5882	.6183	17
LOCATION	2		3.4375	1.0140	32
LOCATION	3		4.0000	.0000	1

Total Cases = 68
Missing Cases = 18 OR 26.5 PCT.

Summaries of Q54
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.1600	.9765	50
TIME	1		4.0000	.0000	5
TIME	2		3.1176	1.0080	34
TIME	3		2.9091	.9439	11

Total Cases = 68
Missing Cases = 18 OR 26.5 PCT.

Summaries of Q55
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.6667	.9933	51
TIME	1		4.0000	.0000	4
TIME	2		3.7500	1.0473	32
TIME	3		3.5000	.9405	14
TIME	9		2.0000	.0000	1

Total Cases = 68
Missing Cases = 17 OR 25.0 PCT.

Summaries of Q56
By levels of SEX

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			3.5319	1.3489	47
SEX	1		3.3030	1.4467	33
SEX	2		4.0714	.9169	14

Total Cases = 68
Missing Cases = 21 OR 30.9 PCT.

Summaries of Q56
By levels of LOCATION

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			3.5319	1.3489	47
LOCATION	1		3.8261	1.2668	23
LOCATION	2		3.1739	1.3702	23
LOCATION	3		5.0000	.0000	1

Total Cases = 68

Summaries of Q56
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			3.5319	1.3489	47
AGE	1		3.3750	1.4079	8
AGE	2		4.2000	.4216	10
AGE	3		3.6429	1.3927	14
AGE	4		3.0667	1.5796	15

Total Cases = 68
Missing Cases = 21 OR 30.9 PCT.

Summaries of Q56
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			3.5319	1.3489	47
TIME	1		4.0000	.7071	5
TIME	2		3.2143	1.4747	28
TIME	3		4.0000	1.1094	14

Total Cases = 68

Missing Cases = 21 OR 30.9 PCT.

Summaries of Q58
By levels of SEX

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.0323	1.3905	62
SEX	1		2.8571	1.4411	42
SEX	2		3.4000	1.2312	20

Total Cases = 68
Missing Cases = 6 OR 8.8 PCT.

Summaries of Q58
By levels of LOCATION

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.0323	1.3905	62
LOCATION	1		3.5000	1.4744	24
LOCATION	2		2.6757	1.2260	37
LOCATION	3		5.0000	.0000	1

Total Cases = 68
Missing Cases = 6 OR 8.8 PCT.

Summaries of Q58
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.0323	1.3905	62
TIME	1		3.1000	1.4491	10
TIME	2		2.6389	1.3126	36
TIME	3		3.9333	1.2228	15
TIME	9		3.0000	.0000	1

Total Cases = 68
Missing Cases = 6 OR 8.8 PCT.

Summaries of Q58
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.0323	1.3905	62
WORK	1		2.3000	1.3429	30
WORK	2		4.0667	1.0328	15
WORK	3		3.9091	.7006	11
WORK	4		2.4000	.8944	5
WORK	9		3.0000	.0000	1

Total Cases = 68
Missing Cases = 6 OR 8.8 PCT.

Summaries of Q59
By levels of LOCATION

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.6333	1.1784	60
LOCATION	1		4.2273	.8691	22
LOCATION	2		3.2973	1.2217	37
LOCATION	3		3.0000	.0000	1

Total Cases = 68
Missing Cases = 8 OR 11.8 PCT.

Summaries of Q59
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.6333	1.1784	60
AGE	1		3.3636	1.1201	11
AGE	2		3.8667	.9155	15
AGE	3		3.5789	1.2612	19
AGE	4		3.6667	1.3973	15

Total Cases = 68
Missing Cases = 8 OR 11.8 PCT.

Summaries of Q59
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.6333	1.1784	60
TIME	1		3.8000	1.0328	10
TIME	2		3.4054	1.2574	37
TIME	3		4.1538	.8987	13

Total Cases = 68
Missing Cases = 8 OR 11.8 PCT.

Summaries of Q59
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.6333	1.1784	60
WORK	1		3.6000	1.2484	30
WORK	2		4.0667	1.0328	15
WORK	3		3.6000	1.0750	10
WORK	4		2.6000	.8944	5

Total Cases = 68
Missing Cases = 8 OR 11.8 PCT.

Summaries of Q60
By levels of SEX

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			3.0877	1.2717	57
SEX	1		2.8108	1.2875	37
SEX	2		3.6000	1.0954	20

Total Cases = 68
Missing Cases = 11 OR 16.2 PCT.

Summaries of Q60
By levels of LOCATION

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			3.0877	1.2717	57
LOCATION	1		3.3750	1.3772	24
LOCATION	2		2.8125	1.1198	32
LOCATION	3		5.0000	.0000	1

Total Cases = 68
Missing Cases = 11 OR 16.2 PCT.

Summaries of Q60
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			3.0877	1.2717	57
TIME	1		3.5556	1.0138	9
TIME	2		2.8485	1.2278	33
TIME	3		3.3333	1.4475	15

Total Cases = 68
Missing Cases = 11 OR 16.2 PCT.

Summaries of Q60
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population					
			3.0877	1.2717	57
WORK	1		2.7037	1.2346	27
WORK	2		3.5714	1.2225	14
WORK	3		3.5455	1.3685	11
WORK	4		2.8000	.8367	5

Total Cases = 68
Missing Cases = 11 OR 16.2 PCT.

Summaries of Q61
By levels of AGE

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.7879	1.1027	66
AGE	1		3.3846	1.3868	13
AGE	2		3.7500	1.0646	16
AGE	3		3.9474	1.0260	19
AGE	4		3.9444	.9984	18

Total Cases = 68
Missing Cases = 2 OR 2.9 PCT.

Summaries of Q61
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.7879	1.1027	66
TIME	1		4.2222	.8333	9
TIME	2		3.6750	1.1410	40
TIME	3		3.9375	1.0626	16
TIME	9		2.0000	.0000	1

Total Cases = 68
Missing Cases = 2 OR 2.9 PCT.

Summaries of Q61
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.7879	1.1027	66
WORK	1		3.6765	1.2726	34
WORK	2		4.3333	.6172	15
WORK	3		3.6364	1.0269	11
WORK	4		3.6000	.5477	5
WORK	9		2.0000	.0000	1

Total Cases = 68
Missing Cases = 2 OR 2.9 PCT.

Summaries of Q62
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.7759	1.1401	58
WORK	1		3.8929	1.1655	28
WORK	2		4.0667	.8837	15
WORK	3		3.3000	1.4944	10
WORK	4		3.2000	.4472	5
Total Cases =			68		
Missing Cases =			10 OR	14.7 PCT.	

Summaries of Q63
By levels of LOCATION

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			1.7581	1.2372	62
LOCATION	1		2.2174	1.5654	23
LOCATION	2		1.5000	.9227	38
LOCATION	3		1.0000	.0000	1
Total Cases =			68		
Missing Cases =			6 OR	8.8 PCT.	

Summaries of Q63
By levels of TIME

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			1.7581	1.2372	62
TIME	1		1.5000	1.0801	10
TIME	2		1.6579	1.0469	38
TIME	3		2.2143	1.7177	14
Total Cases =			68		
Missing Cases =			6 OR	8.8 PCT.	

Summaries of Q63
By levels of WORK

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			1.7581	1.2372	62
WORK	1		1.8065	1.3271	31
WORK	2		1.0667	.2582	15
WORK	3		2.6000	1.5055	10
WORK	4		1.8333	.9832	6
Total Cases =			68		
Missing Cases =			6 OR	8.8 PCT.	