

INDIVIDUAL BEHAVIOR CHANGE IN THE CONTEXT OF ORGANIZATION CHANGE:
TOWARDS VALIDATION OF THE TRANSTHEORETICAL MODEL OF CHANGE
IN AN ORGANIZATIONAL ENVIRONMENT

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A review of literature indicates limited effort to understand and explain employees' acclimation to, and adoption of, new behaviors required by organization change initiatives. Psychological theories of individual behavior change have, in restricted instances, been applied into organizational environments. The transtheoretical model of change (TTM) offers a comprehensive explanation of behavior change uniting multiple theories of individual change. TTM describes change as a series of stages that individual progress through before arriving at the decision to implement a change in behavior. Movement through the stages is facilitated by processes which increase the probability of a behavior change effort's success. The present research investigated the potential applicability of TTM for explaining individual level change within a new context, specifically, an organizational environment.

To examine if individual change in the context of an organization occurs in the fashion described by TTM, measures of core TTM constructs were delivered to employees in a water department of a city in the American southwest. The water department was immersed in an organization change initiative necessitating individual behavior change by its employees. Results of TTM core construct measures and their relationships with each other and the stages of change were examined. Initial findings are indicative of TTM's potential applicability as a description of behavior change within an organizational context. Implications of these findings, potential applications, imitations of the current research, and recommendations for future research are discussed.

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INTRODUCTION

Rapidly evolving conditions, including drastic changes in customer demands, swift advances in technological innovation, plus local and global marketplace competition are forcing organizations to adapt at a pace beyond that previously necessary (Winum, Ryterbrand, & Stephenson, 1997). In addition to external pressures, an acknowledgement that organizational adaptation could, and often does, impact performance creates internal motivation for change (Guzzo, Jette, & Katzell, 1985; Macy & Izumi, 1993). There is a growing acknowledgement of the competitive advantage located in adapting, or “changing,” organizations to better meet the needs of the modern world, match or exceed the accomplishments of competitors (Gersick, 1991), and generally keep pace in today’s environment (Beer, Eisenstat, & Spector, 1990). Organizations that can manage these complex changes and adaptations effectively will not only survive, but thrive (Brown, 2003).

A distinction in terms is necessary, which Neuman, Edwards and Raju (1989) summarize effectively. Organizational development typically refers to particular techniques, technologies, and interventions used to improve an organization. These are the specific technologies used to bring about or facilitate change in an organizational setting. Examples include management by objective, survey feedback and team building. Organization development is typically used to denote a specific process. This process is then typically operationalized as a series of steps and sub-steps. These steps lead to the development, or change, of an organization. The term organization change is often used interchangeably with organization development (Miner, 1992), due to their mutual focus on process, steps and stages. In the context of

this paper, organization development and organization change will be used interchangeably to signify processes used by organizations to make improvements or fundamentally alter some piece of their system.

Though the specific label may change, the implications and applications of constructs such as organization change/development remain fairly consistent. Gurus, workshops, and literature flourish that claim to hold the key to labors in this arena. Proposed levers for effective organization change, typically operationalized as discrete development processes, include socio-technical system interventions (Pasmore, Francis, Haldeman, & Shani, 1982), Six Sigma, quality circles, survey feedback, Total Quality Management, t-groups, team building, work redesign, and management by objectives (Miner, 1992; Creech, 1995; Pande, Holpp, & Pande, 2001). Organization change efforts may also be leveraged by change consultants or experts. Whatever the point of influence used, effective management of these transitions is often critical to institutional survival.

A majority of these levers focus on organization change at the group and/or corporate level. More specifically, many do not translate the generalities of a step or process to specific actions and behaviors at the individual level. Nor do they typically focus on how the change process occurs within and for individual employees (Whelan-Berry, Gordon, & Hinnings, 2003). This despite the fact that organization level change processes inherently involve the group and the individual change processes. Major organization change cannot occur without specific groups and individuals changing. Thus, understanding the individual change processes that occur as part of organization change processes is crucial (Whelan-Berry, Gordon, and Hinnings, 2003).

This lack of focus at the level of the individual employee can be disruptive. It is often not enough to simply change the technology, business process, or structure and expect true organization change to occur. Trist and Bamforth's (1951) classic mine study provides evidence of the power that employees possess relative to the success or failure of a change initiative. In addition to having a sound methodology for initiating and facilitating change efforts, individual employees must also be willing to engage in the change. If a change effort is to succeed, it must thrive at the individual level, as that is where the primary behavior change will occur (Winum et al., 1997). Changes that fail usually do so due to human rather than technical reasons (Palmer, 2004). The organization change literature offers many normative or prescriptive models, which identify what change leaders should do or how to implement a specific change initiative. The relationships between the change process at the organizational level and the change processes at the individual levels are not typically described (Whelan-Berry, Gordon, & Hinnings, 2003). At this more macro level of analysis, the role of the person in the change process is minimized, though macro-level explanations of organization change may be enriched by consideration of the individual change process (George & Jones, 2001). Many authors seem to implicitly address the importance of individuals in organization change efforts, yet never directly speak to individual level change in an organizational environment (Brown, 2003).

To address the apparent lack of individual level focus in the organization change literature, this paper proposes the use of a structure culled from the field of social sciences – the transtheoretical model of change (TTM). TTM has been used primarily in developing interventions for individuals attempting to make health related alterations in

behavior patterns (i.e., quitting smoking, beginning health programs, altering alcohol consumption, etc.) (Velicer, Prochaska, Fava, Norman, & Redding, 1998). Based primarily on the work and research of Prochaska, Norcross, and DiClemente (1994), TTM developed through the assimilation of multiple models of individual behavior change into a single framework focused upon intentional change. TTM posits that change is a process that individuals move through, and that this change process exists in distinct stages. Intentional decisions to change are arrived at through a set of deliberate steps a person makes, eventually arriving at the conclusion to initiate behavior change. TTM describes the stages an individual moves through in arriving at the decision point, processes of change that facilitate movement through these stages, as well as outcome measures found to demonstrate a consistent pattern of relationships with the stages of change (DiClemente & Prochaska, 1998).

The idea of change as a process, a program (Egan, 1998) or as a series of stages (Prochaska, J.M., 2000) is not new, nor is its application in organizational settings. Furthermore, psychologically informed strategies have proven to be effective facilitators of organization change (Winum et al., 1997). TTM provides a model for individual behavior change that has begun to be applied in organizational efforts (Prochaska, J.M., 2000). TTM provides a framework for understanding the mechanisms of change (processes of change), an ordering of stages in the change process (stages of change), and measures for quantifiably assessing movement through these stages (constructs such as decisional balance and self-efficacy/temptation). A testing of TTM's applicability in an organization would work towards establishing a comprehensive model of individual change applicable in this environment.

This paper begins with an overview of organization change. An attempt to define organization change, a review of seminal theories in the field, a discussion of current theories, conceptualizations of change approaches, and the lack of focus at the individual level are included in the overview. This is followed by a survey of previous attempts to conceptualize and explain how individuals change. Descriptions of individual change theories, applications of these theories in organizations, and a discussion of resistance to organization change are provided. A summary of TTM is then delivered. This summary includes the historical background of TTM, as well as discussions of each of the core constructs of TTM – stages of change, decisional balance, self-efficacy/temptation, and the processes of change. Finally, a synthesis of these discussions occurs, focusing on the use of psychological models in organization change initiatives and preliminary research on the applicability of TTM in organizational setting. This synthesis concludes with hypotheses for examining TTM's applicability within an organizational setting and a proposed methodology for moving towards validation of use of TTM in an organizational setting.

Organization Change

Defining Organization Change

There are as many definitions of organization change as there are authors on the topic. However, Porras and Robertson (1992) compiled various definitions of organization development and change to create the following integrated definition: “Organization development is a set of behavioral science-based theories, values, strategies, and technologies aimed at planned change of the organizational work setting

for the purpose of enhancing individual development and improving organizational performance, through the alteration of organizational members' on-the-job behaviors.”

There are four aspects of this definition from Porras and Robertson that are important to note in the context of the research presented in this paper. First is the reference to the foundation of organization development lying within the behavioral sciences. This implicates behavioral science, of which psychology is the most relevant to the present research, as an impetus for guiding change efforts. This distinguishes organization change as focused upon human behavior and differentiates it from initiatives focused on more mechanical aspects of output, such as technology, motorized processes, structures, and/or human's interactions with technology (Pasmore, Francis, Halderman, & Shani, 1982). The second aspect is the definition's focus on planned change. Organization change necessitates a deliberate approach. Lack of planning for an initiative, by this definition, eliminates it from consideration as a true change plan. The third aspect for added attention is the definition's individual level orientation. Organization change seeks an impact at the individual level first, and the organizational level second. This presumes that if change occurs at the individual level, across multiple individuals, then the collective force of this individual level change will be realized across the organization and realized as a full-scale organizational change (Barker & Barker, 1996). The fourth and last aspect for focus is the spotlight on behaviors. This definition construes behavior change as the primary point of leverage for initiating organization change. This definition thereby encompasses a plethora of organization development initiatives that involve some change of behavior patterns by employees.

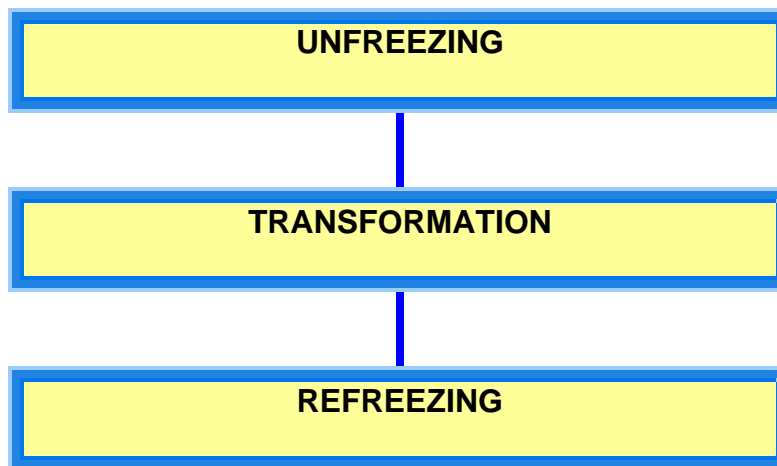
This definition posits that organization change is comprised of the intentional study and alteration of individual behaviors. Therefore, employees become the building blocks for change efforts. Organization change is constituted of alterations in actions made singly by each employee. These alterations, combined across multiple persons and if made in congruence with each other, then become visible as a modification in behavior patterns felt at the community level. Inversely, this definition holds that, without changes in behavior at the individual level, true organization change will not occur. This makes intuitive sense, as changes to other aspects of an organization such as technology, motorized processes and structures will typically have a minimal impact dependent upon how the individuals comprising an organization alter their actions to amplify and accelerate the potential benefits of changes in these areas (technology, processes and structures).

The importance of a focus on change at the individual level as it relates to organization change will be discussed more fully below. However, an understanding of the origins and underlying thinking of change initiatives is helpful in understanding why this individual level focus is necessary. A large number of the theories of change trace their ancestry to a pair of the earliest ideas in this field, both proposed by Kurt Lewin. A third theory, focusing on organizations' existence in and ability to be impacted by the world around them, has also emerged as a leading conceptualization. Following is a discussion of these three seminal theories of or related to organization change: Lewin's three step model of organizational change, his action research model and systems theory. These summaries, and those following, are offered as a representative sampling of and illustration of organization theory, its current strengths and shortcomings.

Foundations of Organization Change

Kurt Lewin is commonly acknowledged as the first psychologist to develop a theory of organizational development (Bodwitch & Buono, 1997). Lewin (1947) used a physical metaphor to describe the way in which social systems, or organizations, experience change. Figure 1 illustrates the three steps of Lewin's model.

Figure 1. Lewin's three-step model of organizational change.



In his model, the first step in change is “unfreezing,” which is the moment at which an organization begins to recognize the need for change. Lewin stated that an organization is incapable of change until recognition of the need to change occurs. In the same way that physiological stressors may induce a stress response in an individual (Greenberg, 1999), so too might any number of motivating factors, including changes in the marketplace or advances in technology, elicit an “unfreezing” by an organization. However, these motivating factors will not automatically elicit an unfreezing, as it is still incumbent upon the organization to choose to unfreeze and begin the change process.

The second step in Lewin's model is that of transformation or “change.” In this step, the physical manifestation of a change effort reveals itself. Measurable and/or

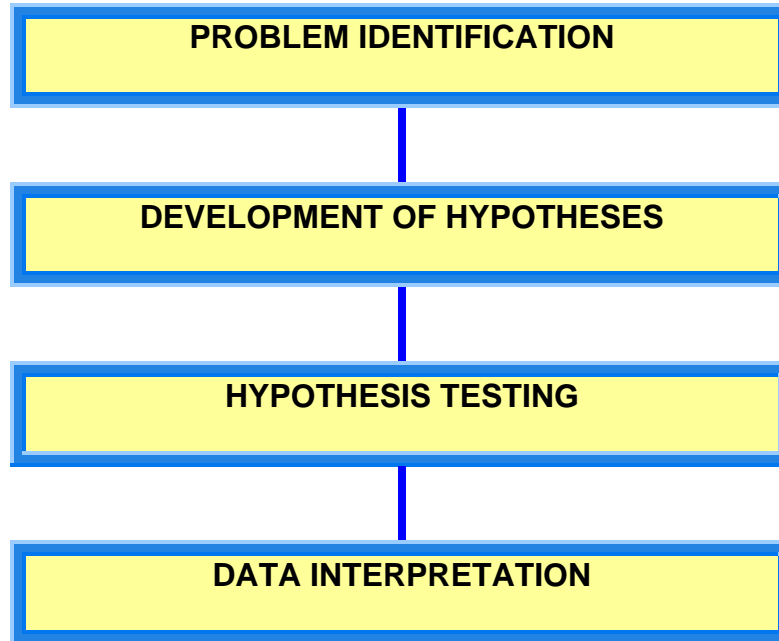
observable alterations in organizational behaviors begin to occur. This step can also bring difficulties because it is creating a need for behavior change, which may provoke anxiety or resistance to behaving in the new way (Jex, 2002).

The third and final step in Lewin's model is "refreezing." The alterations in patterns of behavior that began during the transformation stage have now become a routine pattern of behavior for the organization and its employees. For future changes to occur to the newly refrozen behaviors, some factor would need to provoke another instance of "unfreezing" and the linear change process would begin anew.

Lewin's model is relatively simple in its structure and explanation. In fact, the simplicity of Lewin's model is both its greatest strength and its greatest weakness. The simplicity allows for ease of communication but also limits its precise applicability. Furthermore, while this model provides an excellent description of change, it fails to provide explanations for precisely how and why the three stages occur as they do (Jex, 2002).

A second foundational theory of organization change from Kurt Lewin is his action research model (Lewin, 1951). While the three step model used a physical metaphor to describe organizational change, in this model Lewin likens organizational change to a cyclical research process. Figure 2 illustrates the four steps of Lewin's action research model.

Figure 2. Lewin's action research model of organizational change.



In the first step, problem identification, the organization must first recognize that a problem exists. A problem may be defined as a “difference between the current state of affairs and the desired state of affairs” (Jex, 2002). For instance, an organization may be experiencing greater levels of turnover and lower levels of profit than desired. In the second step, the Development of Hypotheses, the organization chooses where to focus its attention and efforts. This decision is typically colored by the past experiences of the organization and of those managing the organization. When engaging in Hypothesis Testing, during the third step of this process, the hypotheses developed in step two are investigated or examined in some manner. As the last step of this process, the data gathered while testing the hypothesis is interpreted. Action is then taken based upon the results of the data analysis and goals of the organization.

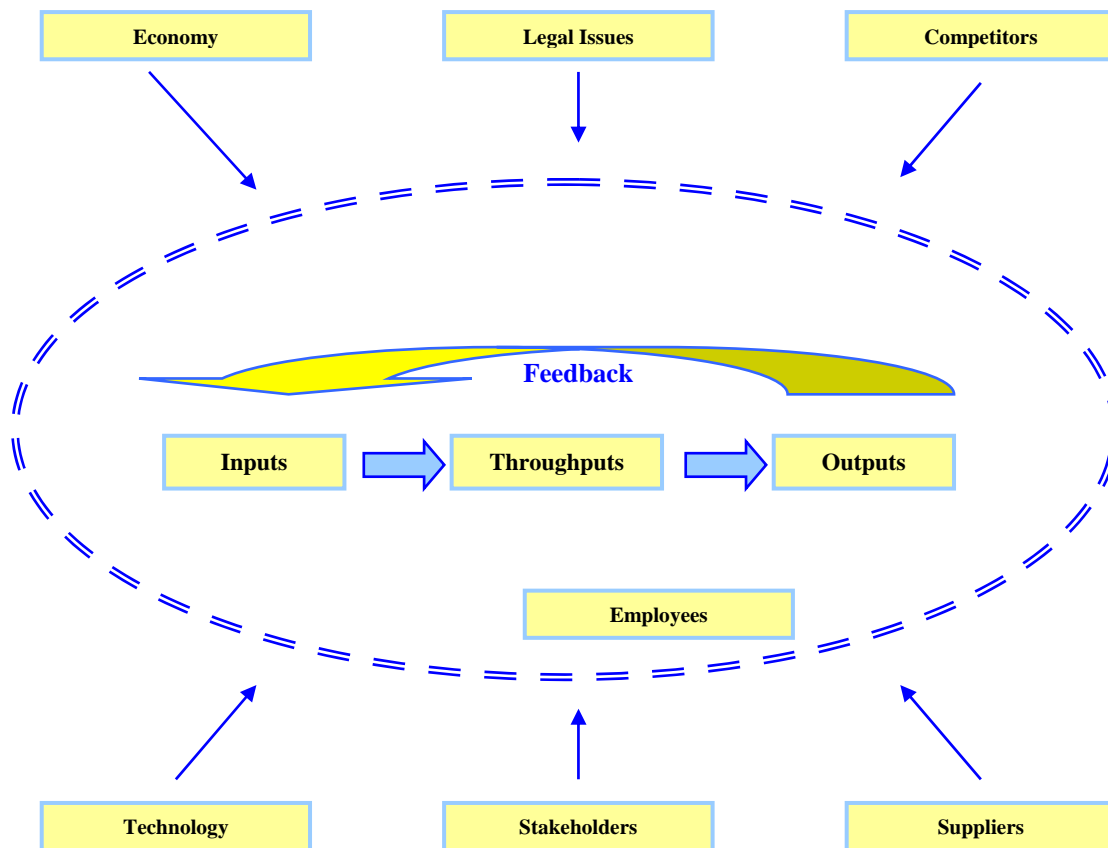
Two important distinctions about this model should be noted. First, this model is conceptualized as cyclical in nature. The model anticipates that the identification and testing of one problem will lead to this same process for another problem, and so on. In this fashion, an organization may continually address new issues and adapt its behavior accordingly. Secondly, this process is conceived as a collaborative effort. There is no distinction between the organizational representatives conducting the research and those whose behavior is being researched (typically the employees). Lewin proposed there to be a positive benefit in a collaborative effort of this sort, which would lead to greater ownership of the change initiative by those involved and, therefore, a greater probability of success for the organization change effort. Action research models, and derivations thereof, are still used and referenced in contemporary approaches to organization change (Harris & Harris, 2002).

The third foundational theory relative to organization change and the research discussed in this paper is systems theory. Cascio (1998) states that a systems theory approach to understanding organizations provides an integrative framework for organization theory and change practice, and it is his discussion of this field of theory that serves as the foundation for the following summary. A system, an organization in the context of this discussion, is conceptualized as a collection of interrelated parts, unified by design, to attain one or more objectives.

An organization is also part of a larger system, including the external environment and its industry of operation, impacting and being impacted by multiple variables of both an internal and external nature. This open system view holds that organizations are in continual interaction with multiple environments and factors, which

provide for a continuing stream of inputs (including people, capital, and information). These inputs operate through and within the open system of the organization (throughputs), emerging as outputs, which are then released back into the external environment or placed back into the organization itself. The outputs placed back into the organization, as well as the reactions of the environment (legal, economic, social) to the outputs, provide feedback to the organization. This feedback may then, either voluntarily or by necessity, be used by the organization as a form of information for use in determining its future actions. A diagram of the open systems process is provided in Figure 3.

Figure 3. Open systems process.



Systems theory holds that an organization, comprised of individuals, the formal organization, small groups, status and role, and the physical setting, is an

interdependent melding (Muchinsky, 1997). An impact on any one piece of the system will be felt by all other pieces. Therefore, any change effort within an organization should be understood in the broader context of the organizational system. To adjust behaviors, alter technologies, or adjust structures in any discrete segment of an organization is to impact the entire system. No change effort exists in a vacuum, and any change that impacts a system's ability to meet its larger goals of stability and growth will be "felt" by all involved in or a part of the system (Muchinsky, 1997).

Change Theory Post-Lewin

Since the introduction of Lewin's models numerous others have initiated their own theories of organization change. These theories have used ideas and presumptions from a range of other fields as foundations. Disciplines that are less well-developed, such as organization change, may draw from other disciplines in an attempt to set and develop its own principles (Porras & Robertson, 1992). Disciplines that organizational theory has drawn from include child development, evolutionary theory, stages of growth, chaos theory, population ecology, and development theory (Van de Ven & Poole, 1995). As this might indicate, post-Lewin theories of how organizations change tend to focus on more theoretical aspects of change than empirical.

Furthermore, a majority of theory remains in a relatively young state (Prochaska, Prochaska, & Levesque, 2001), as evidenced by the range of theory and lack of integration surrounding organization change. The field has, in fact, been characterized as more fragmented and diverse than ever (Pfeffer, 1993), which is illustrated by the

large number of diverse change theories. However, it is important to develop a fundamental understanding of the range of theories to gain perspective as to where change theorists have focused their attention.

Due to the relative simplicity of Lewin's three stage model, and the array of information not covered by such an abbreviated model, many researchers have created models of change that expand upon Lewin's foundational model or at least follow his idea of change as a step-wise process of alterations. Examples include Kotter's (1995) strategic eight-step model for transforming organizations – focused on avoiding major errors in change initiatives; Jick's (1991) tactical ten-step model for implementing change – providing a map for change and tools for evaluating the effort; and General Electric's (Garvin, 2000) seven-step change acceleration process – drawn from Lewin's notions of unfreezing, movement and refreezing. Mento, Jones, & Dirndorfer (2002) further refined and consolidated models such as these into a twelve-step, non-linear process. Their twelve steps included:

1. Highlighting the idea for what needs to be changes and the context within which it is occurring
2. Defining the change initiative
3. Evaluating the climate for change
4. Developing a change plan
5. Finding and cultivating a sponsor
6. Preparing the target audience, the recipients of change
7. Creating the cultural fit – making the change last
8. Developing and choosing a change leader team
9. Creating small wins for motivation
10. Constantly and strategically communicating the change

11. Measuring progress of the change effort
12. Integrating lessons learned

Others have used Lewin's action research model as a starting point. Schappe's (1990) eight-step model of organization change emphasized the role of measurement in the change process and its ability to act as a strong point of leverage for initiating, directing or sustaining change. Though essentially an extension of the action research model, Schappe's model does make explicit the need for distinct forms of measurement during at least three phases of the change process – environmental scan, diagnosis and evaluation. Measurement techniques appropriate for use at these stages include interviews, questionnaires, observations and secondary data. In total, his eight steps include environmental scan, awareness of threat or opportunity, acceptance of data, diagnosis, search for appropriate action, implementation of plan, evaluation, and institutionalization of action.

Systems theory has also informed models of change. McKay and Lashutka (1983) developed a model applying systems theory to social systems and organization change. In this model, multiple causes from the external environment impact a problem embedded within an organization. This spurs management actions toward the problem, often in the form of development efforts aimed at the internal environment and key processes. These actions lead to multiple potential consequences, both intended and unintended. Success, or lack thereof, of an organization change initiative may be mediated by change agents' understanding of the multiple possible causes to a problem. Note that this theory, while grounded in systems thinking, might also be viewed as an extension of Lewin's three-stage model. Pressures applied to the

organization engage change efforts, leading to new patterns of behavior – though those exact patterns may not be predictable due to the myriad potential consequences of a single change in a system. Organizational life cycle models, integrating ideas of systems theory, identify change as a series of transitions an organization undergoes as they develop (Cameron & Whetten, 1988). These are predictable changes from one state or condition to another. Organizations move through evolutionary change, following an *a priori* sequence of transitions, rather than changing randomly.

Across the diverse theories of organization change, multiple ideas are repeated, including the importance of identifying the need or reason for change, creating a related sense of urgency, communicating a vision of the change, and the need for leadership (Whelan-Berry, Gordon, & Hinnings, 2003). Another feature many models share is their lack of systematic, empirical support, as many of the theories tend to be primarily theoretical in nature (Prochaska, Prochaska, & Levesque, 2001). There are important commonalities in how change occurs across such diverse domains as organizations, groups, individuals, species, and physical matter Gersick (1991). Comparing research findings from disparate area is beneficial because different facets of kindred processes may come into focus as the methodology and levels of analyses vary.

Categorizations of Organization Change Theory

The vast number of change theories and their commonalities led to attempts to summarize and consolidate the various models. Dimensions used to classify theories of organization change include incremental versus radical, continuous versus discontinuous, first-order versus second-order, and competence enhancing versus competence destroying (Van de Ven & Poole, 1995). Further examples of this attempt

to classify theories of change are summarized below and include categorizing theories based upon the temporal dimension, by their point of impact, by their focus, or in an attempt to consolidate all theories into one categorical set.

Change efforts may be characterized by their temporal dimension. Quantum change involves making many changes in an organization concurrently, in as short a time as possible and with much realigning of structures and processes. The organization then stabilizes to absorb what has occurred. At the other end of the spectrum is incremental change, which is a more steady approach to organizational change. Changes are made as the opportunity arises and feasibility dictates its initiation. Different parts of the same organization may change at different times and these changes may occur over a long period of time and in phases (Miner, 1992). Note these categorizations essentially follow Lewin's three stage model, with the primary point of alteration being the amount of time necessary to move through the three stages. However, these categorizations do not incorporate specific processes nor an awareness of how change occurs at the individual level. This model is descriptive more than prescriptive and offers a tool for facilitating communication about change efforts but not for their initiation or management.

Change efforts have also been characterized by their point of impact and tools for realizing said impact. Macy and Izumi (1993), in their meta-analysis of organization change efforts, focus on action levers, specific organization development interventions, and their point of leverage in change efforts. Through this focus and as a function of the meta-analysis, the authors categorized change efforts along four organizational design factors and their corresponding levers.

- Structural design – characterized primarily by significant changes in an organization's power and control
- Human resource design – changes carried out within the existing organization's hierarchical structure, while still changing the way people are viewed and view/perform their jobs
- Technological design – focusing on changes in the mechanical, electronic, information and process technologies of an organization
- Total quality management design – focusing on a gamut of areas, including establishing core values regarding quality and customers and work innovation.

This conceptualization provides an effective typology for change. This typology can help change leaders to conceptualize their efforts, providing enhanced focus and structure for decisions regarding the initiation and management of change efforts. However, this categorization still does not incorporate specific steps in the processes nor, more importantly, does it address change at the individual level. The typology does mention the individual employees, but only as those impacted by, and subservient to, organization change efforts.

Change efforts may be categorized by their focus and intent. Beer and Norhira (2000) distinguish between theory E and theory O forms of change in organizational transformation. Theory E refers to a quantitative, “money” oriented form of change, while theory O refers to a qualitative, “people” oriented form of change. However, these two forms of organization change are not mutually exclusive. They can, and often do, exist in harmony with each other.

Theory E patterns of organization change focus on how an organization can be adapted to realize a greater proportion of profits to capital investment than is currently realized. The goal is for the company to earn greater profit without significantly increasing spending. Financial vitality is the primary motivating initiative for change

efforts. Theory O patterns of organization change focus on what have been labeled by many the more “soft” areas. This form of change is grounded in the principle that an organization is only as good as its employee base. An organization of poorly trained or under-skilled employees, no matter how well managed and organized, will only achieve within the boundaries imposed upon them by their mental and physical abilities. Theory O patterns of organization change typically work towards “soft” goals of employee selection, development, and retention. This may take the form of training, the establishment of a teaming environment, work-life balance initiatives or employee assistance programs.

Theory E change efforts do maintain an individual level concern by extension of its bottom line focus. If the company is not realizing profits, it will cease to exist and, therefore, so will the jobs and incomes of its employees. An organization realizing greater proportions of profit may be more willing to distribute that wealth amongst its employees than an organization not realizing profits. However, this conceptualization of change does not directly address the individual concerns of employees encountering change within their organization. Theory O is one of the few overall categorizations of change with a focus on individual-level impact. As with theory E, though, it does not address specific aspects of how individuals experience change nor specific processes for incorporating change initiatives into individual patterns of behavior.

Finally, in their attempt to codify and distill a discrete number of theory areas, Van de Ven and Poole (1995) identified 16 combinations of change theories through an interdisciplinary literature review. The authors then further distilled these theories into four basic process theories, with the intent of breaking down the boundaries between

discrete theories of change and then allowing these four categories – life cycle, teleology, dialectics, and evolution – to serve as ‘building blocks’ for explaining processes of change in organizations. Life cycle theory adopts an organic metaphor to explain organization change. Change is imminent, with the organization containing an underlying form or program that the process of change moves the organization toward in a linear progression. This predetermined sequence of events guides the organization in a sequence of stages towards its full potential. Teleology theory holds to the philosophical idea that an organization’s ultimate purpose or goal drives change. An organization envisions a goal or end state, which it then takes action on to achieve. Unlike life-cycle theory, there is not a set pattern of steps to be followed. Purposeful cooperation guides the actions taken toward goal attainment. Upon achievement of a goal, an organization may then begin the process anew, as novel goals are developed.

Dialectic theory is guided by the assumption that organizations exist in a world of opposing forces, both internal and external, that compete for control. These opposing forces create the energy that initiates organization change, when one of the opposing forces creates enough power to challenge the organization’s current stability. The interaction of these forces and their challenge of the status quo eventually synthesize into a new state of stability, with the establishment of a new status quo. Stability is the common state, with change equating to a conflict between the current state and a potential new state with sufficient power to challenge the status quo. Note the similarity of this theory to Lewin’s three stage model. The last theory categorized by Van de Ven and Poole is Evolutionary theory. This theory focuses on cumulative change in organizations which proceeds in a continuous cycle of variation, selection and retention.

Organization is then a necessary function of the attempt to survive in the marketplace, with some form of natural selection winnowing the organizations. Change is recurrent and cumulative, impacted by competition and resource availability.

These four categories of change attempt to consolidate the vast change literature into a taxonomic system. This potentially allows change agents and interested organizations to select a methodology based upon their given contextual factors and to provide a foundation for explaining change and establishing empirical measurements of change. This work by Van de Ven and Poole (1995) provides a comprehensive overview of change models. It outlines a vast array of change methodologies and suggests a process by which the most effective models of change may be chosen for a given initiative. However, this same categorization falls short in its dependence upon each change model's ability to explain and facilitate a given change initiative. Furthermore, this categorization represents the continuing lack of focus on how individual-level change occurs within the organizational change context.

Lack of Focus on Employees in Organization Change Literature

The preceding discussion is intended to illustrate a series of four issues, which taken together line out the rationale for the research captured in this paper. First, true organization change, by definition, necessitates the alteration of individual behavior patterns (Porras and Robertson, 1992; Barker & Barker, 1996). This is intuitively agreeable for those changes directly involving employees. However, even those changes not directly impacting employees require modifications of individual behavior for the organization change to be realized. New technologies (i.e., software packages and communication systems) will only be successful if correctly implemented by

individuals. Process changes (i.e., inventory maintenance procedures and customer service methods) will accomplish their impact only if individual employees use the processes in day-to-day work activities. Redesign of organizational structure (i.e., flattening organizational structures and classification alterations) will impact business practices only if individuals recognize those structures and act within new and changed roles inherent within the novel organizational structure. So, organization change, either explicitly or implicitly, implies the need for change at the individual level for organization-level change to occur.

Second, the foundational theories of organization change, as a whole, do not directly address individual-level change. Of the three foundational theories discussed – Lewin’s three stage (Lewin, 1947) and action research models (Lewin, 1951) and systems theory (Cascio, 1998) – only the three-stage model has been consistently applied to change at the individual level (George & Jones, 2001). The action research model is process oriented. Individuals are catalysts for the implementation and management of the model, but their individual reactions to and actions related to change are not addressed. Furthermore, though the use of an individual body and its physiological operation has been used as a metaphor for systems theory (Kast & Rosenzweig, 1972), the theory itself focuses primarily upon the various components of systems, which interact in an on-going fashion to produce change. Though individuals are considered one part of the overall system, behaving within and being impacted by the system, specific applications to individual-level change are typically not addressed.

Third, a survey of theories of organization change, and the attempts to categorize groupings of change theory, amplifies this lack of emphasis on individual-level change

(Jick, 1991; Kotter, 1995; Garvin, 2000; Mento, Jones and Dirndorfer, 2002). A majority of change theories are process and step focused, stressing methodologies for developing, initiating and managing change. Limited attention is paid to how the changes impact individual employees or how they incorporate these changes into their daily, work-related behavior patterns and overcome feelings of resistance (Bodwitch and Buono, 1997, 317; Zell, 2003). In fact, employees are often viewed as potential roadblocks, whose primary reaction to change will be to resist alterations in their work setting and behaviors. The attempted categorization of change theories fails to incorporate a focused view of individuals' roles in organization change efforts. Organization change initiatives typically involve implementation and adoption at the group level, that is, across locations, departments or teams, as well as at the individual level. Major organization change cannot occur without specific groups and individuals changing. Therefore, understanding the individual change process is crucial (Whelan-Berry, Gordon, & Hinnings, 2003).

Why has there been this apparent lack of attention paid to individual employees' roles in organization change efforts? It may, in part, simply be due to a lack of understanding for how individuals engage in a change process or make behavioral changes. A goal of this paper is to explore a model of individual change potentially applicable within an organization, as limited work seems to have occurred in this area. To that end, the discussion turns its focus to individual change.

Individual Change

Foundational Models of Individual Change

Theories of how individuals change, and how to facilitate such change, have grown primarily from the psychological literature. (Craighead, Craighead, Kazdin, & Mahoney, 1994) Freud believed making the unconscious conscious through cathartic hypnosis and free association affected behavior change. According to Eysenck and his theories of psychopathology, an individual affects behavior change, or avoids negative behavior change, by unlearning previously learned fear responses or by learning new codes of behavior. Kelly discussed change as the process of reconstructing an individual's construct system. Doing so would subsequently lead to new behavioral patterns (Pervin & John, 1997). Approaches to behavior change have been applied primarily in psychotherapy (Pervin & John, 1997), though their applications in organizational settings are growing. Behaviorism, learning, cognition, affect and reactions to change have all influenced the current understanding of how humans experience change. Behavioral theories, such as those of B.F. Skinner (Bodwitch & Buono, 1997; 100-101), propose that individuals change based upon alterations in environmental conditions and the results of their behaviors. Psychotherapeutic applications of behavioral theory include systematic desensitization, modeling, positive reinforcement, extinction, aversive conditioning and punishment. (Berstein, Clarke-Stewart, Roy, Srull, & Wickens, 1994, 578) Three prominent applications of behavioral theory, classical conditioning, operant conditioning and learning, as summarized by Craighead, Craighead, Kazdin & Mahoney (1994), are provided below.

Classical conditioning focuses on behaviors automatically evoked by particular stimuli. An unconditioned stimulus evokes a specific response in behavior. For behavior change to occur, this pattern of response must in some way be altered. This is traditionally accomplished by pairing a neutral stimulus with the unconditioned stimulus, until the previously neutral stimulus, now referred to as a conditioned stimulus, elicits the same response as the unconditioned stimulus. Therefore, alterations in behavior occur by learning to associate new stimuli with particular behaviors.

Operant conditioning suggests that behaviors may be influenced by a change in the consequences that follow a behavior. An outcome that increases the likelihood of a behavior recurring is referred to as reinforcement. Outcomes that decrease the likelihood of a behavior recurring are referred to as punishment. Behavior change occurs as a function of applying or removing reinforcement/punishment. For individuals to experience behavior change, they must alter, or have someone else alter, the consequences of their behavior. Behavior change may also occur due to a reduction in the frequency of reinforcement. If behaviors that previously elicited reinforcement cease to do so, the frequencies of said behaviors are also likely to decrease. Individuals may then experience behavior change through the cessation of reinforcement. Operant conditioning also describes the relationship between behavior and its antecedents. The environmental situation may impact choice of behaviors. Events that help to initiate a response are referred to as prompts. Behavior change can then be facilitated by using prompts to guide behaviors, which may then be reinforced, increasing the likelihood of their recurrence.

Individual behavior change may also occur as a function of observational learning. Also referred to as modeling, an individual experiences an alteration in behavior patterns by observing others' behavior. Based upon the consequences experienced by the observed other, the individual may then choose whether or not to engage in those same behaviors. For behavior change to occur, the individual must observe and learn new behaviors from others considered to be role models. One criticism of behavioral explanations of change is their lack of accounting for human cognition. How do the thoughts experienced by individuals impact their willingness to undertake behavioral change? Do reinforcers always increase the likelihood of a response, or might cognition impact the likelihood of effective reinforcement? Cognitive psychology offers further insight into how and why individuals might choose to willfully alter behavioral patterns.

Cognitive psychotherapy views behaviors as being primarily driven by thought patterns. To alter behaviors, an individual must change the way she/he thinks (Craighead, Craighead, Kazdin & Mahoney, 1994). In this framework, behavior change might be considered a function of an individual's ability to attribute to themselves greater control over their behavior and subsequently change their behavior. This is similar to the idea of self-efficacy (Bandura, 1977), which is one's perceived capacity to meet some challenge or perform a particular response. Egan (1998; p. 23-24) suggests that there is a natural, cognitive decision-making process, composed of distinct steps, that individuals engage in when choosing to make a change. Though the steps are presented in a linear fashion, the steps often intermingle. Furthermore, the process can be disrupted at any point.

1. Initial awareness – The individual becomes aware of an issue or set of issues.
2. Urgency – The individual develops a sense of urgency regarding the issue.
3. Initial search for remedies – Different strategies for managing the issue(s) are explored.
4. Estimation of costs – The costs of pursuing different solutions – making a change – are calculated.
5. Deliberation – Since the issue is now seen for what it is, the individual can not retreat completely and so a more serious weighing of choices takes place.
6. Rational decision – An intellectual decision is made to accept come choice and pursue a certain course of action. A change is made.
7. Rational-emotional decision – Finally the “heart joins the head” in the decision. The change is now permeated with values and emotions, as well as cognitive choice. Behavior change occurs.

Another cognitive-based approach to behavior change is that of goal setting, or defining a new pattern of behaviors or outcomes and working to achieve it. This involves assessing the current status or set of behaviors, defining the desired status or set of behaviors, and then working to achieve the desired situation. (Hackney & Cormier, 1996; 116). Though behavioral and cognitive explanations of change offer much, there is an acknowledged affective component to change, as well. The range of affect experienced during change is most frequently described in reference to the work of Dr. Elizabeth Kubler-Ross, who captures both cognitive and affective aspects of change.

Dr. Kubler-Ross studied the human transition process associated with death as a means of investigating how humans responded or adapted to change. Kubler Ross's *On Death and Dying* (1969) outlined five phases individuals pass through when coping with trauma or serious illness. The five stages of Kubler-Ross' theory are denial, during

which the individual does not believe the change to be truly occurring; anger, when an individual experiences deep emotions, often directed at others and in a negative fashion; bargaining, when an individual acknowledges the illness but attempts to negotiate more time to engage in desired activities; depression, when feelings of sadness may overwhelm the individual; and finally acceptance, at which point reparation for impending death occurs. Building upon this idea, Randall (2003) posits that any involuntary change, not just impending death, results in an individual experiencing a grieving process. The first stage/reaction is denial and shock. The remaining stages progress in the following order: anger, bargaining, guilt, depression, loneliness, acceptance and then hope. Note that these theories focus on cognitive and affective reactions to change more so than how affect can be used to impact or influence change. Though these theories provide insight into post-change processes, it does not explain how or why individuals choose to make a change in behavior.

Models of Individual Change in Organizations

Models of individual change have been applied within organizations. Behavioral theories of psychology, and their impact on individual behavior change, have been implemented as organizational behavior modification (OBM) (Bodwitch & Buono, 1997, 102). This process is focused on reinforcing preferred work behaviors while working towards elimination of work behaviors not desired. This approach focuses on altering and maintaining individual behavior that makes the organization more efficient or effective. The fundamental approach is linking behavior to antecedent conditions that appear to suggest desired behaviors and to consequences that appear to encourage or discourage its recurrence, as so desired.

Many models of individual change applied in organizations follow the basic model of Kubler-Ross, some more explicitly than others. Reynolds (1994) illustrates a model of individual level change in organizations based upon the work of Dennis Jaffe and Cynthia Scott. This model proposes that employees progress through four stages in the organization change process: denial, resistance, exploration and commitment. During denial and resistance, employees tend to be self-interested and dwell on the past. Employees in this phase require opportunities to ask questions and express their feelings while being kept informed on the status of the change initiative. Once individuals move into the exploration and commitment phases, a burst of energy and activity usually occurs. Focusing employee energy through provision of ownership of the change can increase the chance of a successful change initiative.

Laframboise, Nelson, and Schmaltz (2002) also suggest a model mirroring that of Kubler-Ross. The authors adapt the stages into discovery, denial, resistance and acceptance, for subsequent application with an organizational environment. Discovery is usually the quickest stage employees move through. An effective communication strategy and robust information provides a foundation for employee trust and understanding. This is important as the goal during discovery is to minimize surprises and set a clear vision for change. Once aware of the change, employees may move into denial, potentially adopting an 'I'll believe it when I see it' attitude. Denial generally stems from employees' perception of how management has carried out similar projects in the past. Once employees realize the change is inevitable, they enter the resistance stage, showing signs of frustration or anger towards the project. Resistance stems from feeling an inability to influence the changes that are taking place in their lives and

workplace. Given ample information and opportunities for involvement, employees move into the final phase of acceptance. Employees reach an understanding of the transformation that will occur and are prepared to move forward. However, not all will reach this stage and not all employees follow this progression in a regimented and linear fashion.

Research using interview data supports the notion that individuals adapt to organization change in a process closely resembling that of Kubler-Ross' death and dying stages. An open-systems perspective was used to explore how a large, public research university responded to changes in its environment (Zell, 2003). Interview data was collected from impacted professors throughout the change process. Analysis of the interview data, collected at different points during the transition, placed professors into stages of the grief process. A majority of the professors began in denial, avoiding talking about the department's situation and the needed changes. Initial refusal to acknowledge sharp drops in numbers of applicants to their program was one indicator of denial. As it became more apparent that their environment had indeed changed, the professors moved into the stage of anger. They blamed their problems on the public, the federal government and other departments within the university. As time progressed, the professors began to accept that changes were necessary, but not the full extent of the changes needed. Thus, they began bargaining, initiating efforts to maintain the status quo while commencing as few actual changes to their current situation as possible. When this proved unsuccessful, the faculty entered a mild state of depression and gloom. Finally, and gradually, faculty began to accept the necessity of changes and made shifts in behavior towards those changes. Though not all individuals moved

through these stages in lock-step progression, a scatterplot displaying the stage of each individual across time shows a definitive trend of movement through the stages in the fashion outlined by Kubler-Ross. Zell (2003) posits that individuals' experience of change in an organization context is similar to Kubler-Ross' stages because, when making fundamental changes in activities about which employees are passionate, a part of them is 'dying.' Still in question is what propels people through the stages, preventing them from getting stuck at a particular stage or caught in an endless loop, never achieving acceptance of the change. As mentioned previously, Kubler-Ross based models provide insight into affective and cognitive reactions to change. However, little explanation appears to be provided by these models relative to how and why individuals in organizations might voluntarily choose to engage in change.

Cognitive models provide further insight into processes experienced by employees choosing to make a change. Labianca, Gray and Brass (2000) propose that employees will make behavior changes only when cognitive schemas are fundamentally altered. Their model proposes an iterative, four phase model for individual change within the context of an organization change effort. In the first phase, the motivation to change phase, organizational members are presented with evidence intended to disconfirm a previous decision-making schema. This is similar to Lewin's (1951) unfreezing, in that some force, in this case disconfirmatory information, provides the impetus necessary to initiate a change. Interestingly, many individual intervention strategies, designed to bring about change in individual behavior, have been developed along the lines of Lewin's three-stage model. (Bodwitch & Buono, 1997, 324). The second phase of Labianca, Gray and Brass' model, new schema generation, involves

formation of new decision-making schemas and development of expectations about how these schemas will be enacted. During this phase, organizational members simultaneously retain the old schema while beginning to construct the new one. In the third phase, the schema comparison phase, organizational members compare the old and new decision-making schemas as the organization change is implemented. For example, employees might evaluate management's ongoing actions as to whether the actions were consistent with the original schema or the new one. Finally, during the stabilization phase, organizational members either retain the old schema – and change does not occur – or increasingly rely on the new schema. Although predominantly a cognitive process, individual schema change also associates affect with individual schemas and willingness to change. Behavioral and learning theories of individual change are also implicit within this model. For example, the authors view schemas as inherently resistant to change. However, significant disconfirmatory information may stimulate the creation of new schemas. If the new schemas are reinforced during the schema comparison phase, the new schema will eventually replace the old schema, leading to changes in behavioral actions.

Behavioral and affective aspects of change tend to be addressed even in those models focusing primarily on cognition. George and Jones (2001) propose that change in organizations is an individual, and group, sense-making process within a social context, produced by ongoing interaction. They focus at the individual level as change is initiated and carried out by individuals (Porras & Robertson, 1992). Examining the process of change in the organizational or group levels of analysis requires the analysis of the process of change at the individual level of analysis. George and Jones (2001)

describe change as an alteration in beliefs, interpretive schemas and, therefore, behaviors. Schemas are abstract cognitive structures containing knowledge about a kind of stimulus or concept, its features or attributes, and the interconnections between its attributes. These simplified mental theories are used to make sense of instances that match or fit the schema. The model describing this process cognitive and cyclical: 1) discrepancy or inconsistency with pre-existing schemas is encountered, 2) emotional reaction to discrepancy, 3) moderation of emotion; attention directed to pressing concern, problem or opportunity, 4) information processing of pressing concern, problem or opportunity, 5) challenge to preexisting schemas, 6) substantive information processing of challenge and 7) schema change. People exist in a state of cognitive equilibrium with their present schemas.

However, presentation of novel information incongruent with current schemas may provoke an affective reaction. This affective reaction is paired with an assessment of the new information against the current schemas. This may result in the alteration of expectations and views of the world or general reframing. If this occurs, an individual's schemas change, causing a subsequent change in behaviors and affective reactions to future encounters relevant to the schema in question.

This model bears similarity to Hegel's idea of the dialectic process (Hergenhahn, 1992), wherein a thesis – one point of view – is compared against an antithesis – the opposite point of view, resulting in a synthesis, or a compromise position somewhere between the synthesis and antithesis. However, the dialectic process assumes a compromise between the two positions. The model of George and Jones (2001) states that, if the new information does not provoke an affective reaction of sufficient strength,

the new information will likely be discredited by the individual and the current schema will remain intact. Resistance to change in this model is characterized in multiple fashions, including rationalization, learned helplessness, denial, discounting of new information and/or considering new information as an exception. George and Jones apply this theory in an organizational setting throughout their discussion of the model, though only in a theoretical fashion. The model recognizes the interplay between emotion and cognition in decisions regarding change. At the end of their discussion, the authors suggest that an exploration of how individual differences may result in people being more or less likely to complete the cycle of change. In fact, much of the literature focusing on change at the individual level is concerned with reactions to change. Specifically, theories of resistance to change in organizations. These theories of resistance provide further, but limited, insight into the mechanisms of employee behavior change.

Resistance to Change

The idea of resistance to change could be traced to Lewin's (1947) three stage model (1947). His idea of unfreezing implies that humans, or the organizations they inhabit, will naturally remain in their current state unless some force impels them out of their current state. This idea has been repeated through time, as resistance is normally categorized as humans' natural and primary response to change (Davidson, 2002). Though typically viewed in a negative fashion, resistance may also be conceptualized as a natural and necessary part of any change process. Resistance is not inherently negative, but an attempt to recover meaning or preserve what was valuable in the past (Antonacopoulou & Gabriel, 2001).

Despite this, much literature focuses on the idea that people and the organizations they inhabit seldom welcome change. Building upon Lewin's model, Coch and French (1948) identified ways in which resistance to change is manifest within an organization, including grievances, high turnover rates, low efficiency levels, and restriction of output. Servier (2003) also suggests a theory of resistance similar to Lewin's. If the pressure to change is not greater than the resistance to change, little will happen. Stasis has been achieved or maintained. However, there are strategies to overcoming employee resistance to change: clarify the change event; create a sense of urgency; develop a course of action; establish a guiding coalition; communicate your course of action widely; generate and celebrate near-term wins; anchor change in the organization. The thought of change may be met with fear of failure or loss of control. Though resistance is typically conceptualized as an inherent reaction, how change is implemented may also impact both the quantity and quality of change.

A mistake often made is initiating a change without first preparing staff for the change and involving them in the change process (Brown, 2003). According to Whetler (1998), there are four reasons individuals may not be ready for, and therefore resist, change. First, they may have uncertainty resulting from lack of information. Second, they may have feelings resulting from fear for a job. Third, it may be that the organizational culture blames those who make mistakes. Fourth, there may be bad relationships. Employees who resist change can cripple an organization. Employees resist change through their behaviors, though these behaviors don't tell us why an employee is resisting change. The six most common reasons for resisting change include the employee feeling their needs are already being met; a belief that change will

make it harder for them to meet their needs; belief that the risks of change outweigh the benefits; belief that it is unnecessary to avoid or escape a harmful situation; belief that the organization is mishandling the change process; and a belief that the change will fail. Generally speaking overcoming resistance is a four-step process. You must verify facts; challenge beliefs; acknowledge feelings and relate the change to people's values (Huffman, 1995).

Change efforts may be initiated an appropriate fashion, yet still encounter resistance from employees. Fisher (1995) suggests that the real cause of organization change effort's failure is management's incompetence in responding to resistance appropriately. In order to reduce resistance, empower people; listen to their ideas; constantly communicate the company's goals and how the brass expects to achieve them; lead by example; be consistent and get people talking. An effective way to handle resistance is to put the loudest dissenters in charge of solutions. While humans are remarkably adaptable, you have to make it logical for them to want to change. True change is accomplished by changing a few minds here and there and, little by little, people start listening and behaviors start to change.

It has been suggested that resistance to organization change is irrational and that it arises from innate, rigid, authoritarian and insecure personality patterns (Miner, 1992). However, Bennebroek, Gravenhorst, Werkman, and Boonstra (2003) concluded that resistance is not an inherent psychological reaction or caused by organizational bureaucracies. Resistance is instead impacted by the change process itself. That is, individuals will resist a change being "forced" upon them that is perceived as badly designed and managed or as having little positive impact on their daily lives. This is an

interesting idea in that it suggests that resistance will not always occur. Furthermore, it implies that there are particular steps that can be taken at an individual level to increase the probability of a change effort's success. To conquer resistance, you have to apply techniques at the individual level (Palmer, 2004).

Dent and Goldberg (1999) challenge the notion that all individuals resist change. They suggest that individuals' resistance to loss of status, loss of pay or loss of comfort are not the same thing as resisting change. Resistance has, for decades now, been viewed as residing within the individual, and the manager's task is to overcome that resistance. Based upon a review of relevant texts, Dent and Goldberg concluded that change is viewed as too broad a term for people to resist, particularly in light of the fact that many individuals seek out and embrace change. They instead believe that one of the fundamental flaws of change efforts is its attempt to create programmatic change as opposed to beginning with the knowledge and attitudes of individuals.

Krantz (1999), in a discussion of the views of Dent and Goldberg (1999), feels that resistance has been transformed into a way of blaming the less powerful for unsatisfactory results of change efforts. Whether or not people resist change, Krantz feels the concept has been distorted and used to provide managers with an easy, blame-shifting explanation for a more complex reality. The challenge is to restore the idea of resistance in a non-blaming fashion. For instance, TTM could be, if so chosen, conceptualized as a pro-active responsibility taking tool for management. TTM does not necessarily assume resistance to change. However, it does assume that we move through the stages before making a change. Overall, there seem to be lots of explanation as to what can be done to lower resistance to change, but nothing about

why these methodologies reduce resistance. Overall, there seems to be a lack of a comprehensive model of individual change, incorporating ideas from across the theories, empirically verifiable, and applicable within an organization.

The Transtheoretical Model of Change (TTM)

Definition of TTM

TTM is emerging as a leading model for explaining and facilitating behavior change in individuals ("Change for Better," 2004). TTM is primarily used to explain how health-related behavior change occurs at the individual level (Prochaska, DiClemente, & Norcross, 1992), for example the cessation of smoking or the adoption of proactive health behaviors. However, the quantity of applications of TTM in organizational settings (Scholl, 2000; Prochaska, Prochaska & Levesque, 2001) and with business and professional-related behaviors (Xiao, O'Neill, Prochaska, Kerbel, Brennan, & Bristow, 2001) is increasing. Researchers are consistently revealing TTM's ability to help understand and explain behaviors relating to individual change, including but not limited to persons with addictions (Levesque, Prochaska, & Prochaska, 1999), alcoholism (DiClemente & Hughes, 1990), smoking (Fava, Velicer, & Prochaska, 1995), and even choices on whether or not to act as a organ donor (Robbins, Levesque, Redding, Johnson, & Prochaska, 2001).

The cornerstone of the model is the stages of change. TTM holds that change is a process of stages that individuals deliberately move through and not necessarily a single decision made at a unique point in time (Prochaska, 1994). The stages of the change, in order, are precontemplation, contemplation, preparation, action and

maintenance. These stages represent distinct steps in a change process that an individual must move through to maximize the probability of a successful and successfully maintained change effort. At each stage of the process, decisions are made that move an individual either towards or away from a change. Before the final decision to institute change will be made effectively, an individual should have progressed to the latter stages of the process. To that end, TTM not only proposes the stages of change that an individual moves through but also specific processes of change, methods for improving and facilitating an individual's movement between stages.

While the idea of change as a process or program is not new (Egan, 1998), TTM provides a model for change that consolidates various modes of change theory and lends itself to empirical validation (DiClemente & Prochaska, 1998). It incorporates applications of behavioral, cognitive and affective approaches to change. Furthermore, it provides guidance of specific interventions to facilitate movement towards successful change. This guidance supplies the additional benefit of reducing resistance to change by assisting individuals in the movement through the stages of change.

Foundational Research with TTM

Based primarily on the work and research of Prochaska, Norcross, and DiClemente (1994), TTM is a model of change developed through research and by building upon and incorporating ideas across multiple veins of individual change theory. There are four core constructs of the model – stages of change, decisional balance, self-efficacy and the processes of change. These constructs display consistent and

systematic relationships in the research literature (Prochaska, DiClemente, & Norcross, 1992). The primary core construct of TTM are the stages of change.

To facilitate the explanation of when change occurs, TTM posits that change is a process of five stages that individuals move through, and not necessarily a single decision made at a unique point in time. There are distinct steps to this process and, potentially, multiple decisions to make at each stage before the final decision to implement a change in behavior will be made successfully (Plummer, Velicer, Redding, Prochaska, Rossi, Pallonen, & Meier, 2001). Part of this change process also involves preserving the change decided upon until it becomes a regular part of the individual's everyday life, referred to as maintenance. The five steps within the change process, normally assessed using self-report methods, are generally defined as follows (Levesque, Prochaska, & Prochaska, 1999):

1. Precontemplation - Individuals do not recognize that there is a problem or the need for change (or the possibility of change) and, therefore, have no intention of changing within the near future (typically operationalized as change within the next six months).
2. Contemplation - Individuals acknowledge that there is a problem or a change to be (potentially) undertaken and will begin to seek out ways to solve this problem, which they will likely take action on within the next six months. An individual may be seriously considering overcoming a problem behavior or making a change, but has not yet made a commitment to change.
3. Preparation – This stage combines intention with the beginnings of actual, small, behavioral change. Individuals are making their intentions to change clear to others and are preparing themselves mentally for this change and its consequences, which they will likely take action on within the next 30 days (immediate future).
4. Action - The individuals modify their behavior, decisions and actions in such a way that change is evident. A change or decision has been enacted within the last six months (immediate past), which often requires a considerable expense of energy and time.

5. Maintenance - The individual works to make the change effective and to prevent any sort of relapse from changes they enacted more than six months ago (in the recent past). Maintenance is a continuation of, not the absence of, change.

Though conceived and classically communicated as a linear process, movement through the stages of change has been shown to be spiral in nature (Prochaska, DiClemente, & Norcross, 1992). Not all individuals move through the stages of change in a step-wise, linear fashion; moving from precontemplation into contemplation into preparation and so on, with no fluctuations or regression to previous steps. Most individuals, in the course of moving towards a decision to institute a change will spiral, ebb and flow between the stages as their emotions, understandings and thoughts of self-efficacy or temptation modulate. In the course of instituting a change, many individuals experience returns to earlier behaviors before sustained behavior change is finally attained (Prochaska, Norcross, & DiClemente, 1994). For example, smokers make an average of three to four action attempts to change (quit smoking) before they finally move into the stage of long-term maintenance, at which point they are no longer smoking (Schachter, 1982). This basic pattern has also been observed in decisions to initiate other health related behaviors such as regular exercise (Laforge, Rossi, Prochaska, Velicer, Levesque, & McHorney, 1999).

A unique quality of TTM as a model for change is its inclusion of outcome measures relative to the change process. One factor that has been quantitatively assessed as an outcome measure of the change process, relative to an individual's movement between stages, is the symmetry between the perceived advantages and disadvantages of initiating a particular change (Rossi, Greene, Rossi, Plummer, Benisovich, Keller, Velicer, Redding, Prochaska, Pallonen, & Meier, 2001). This

equilibrium is operationally defined as the core construct of decisional balance, and has proven to be closely related to an individual's stage of change and, therefore, the probability of successfully initiating a change.

Decisional Balance

A second core construct of TTM is decisional balance. Longitudinal studies of change have found decisional balance measures to be an effective and consistent predictor of future change (Levesque, Prochaska, & Prochaska, 1999). Decisional balance is an assessment of how individuals weigh the advantages, or "pros," of making a change versus the perceived disadvantages, or "cons," of a particular change. Decisional balance is derived primarily from the work of Janis and Mann (1977) and their model of decision making. Their original model identified four categories in a 'gain versus loss' model of decision making: (a) utilitarian gains and losses for self; (b) utilitarian gains and losses for others; (c) self-approval or self-disapproval; and (d) approval or disapproval from others. This model incorporates instrumental considerations as well as nonutilitarian considerations such as self-esteem, social approval, internalized moral standards and ego ideals in the decision-making process (Janis & Mann, 1977).

Following this line of thinking as it applied to smoking cessation and TTM, Velicer, DiClemente, Prochaska, and Brandenburg (1985) developed a 24-item measure of decisional balance used to assess and predict smoking status. In this study, the 24-item measure of decisional balance was refined from Janis and Mann's four scales into two, pros of smoking and cons of smoking. These two scales successfully differentiated between the groups representing the five stages of change in the process

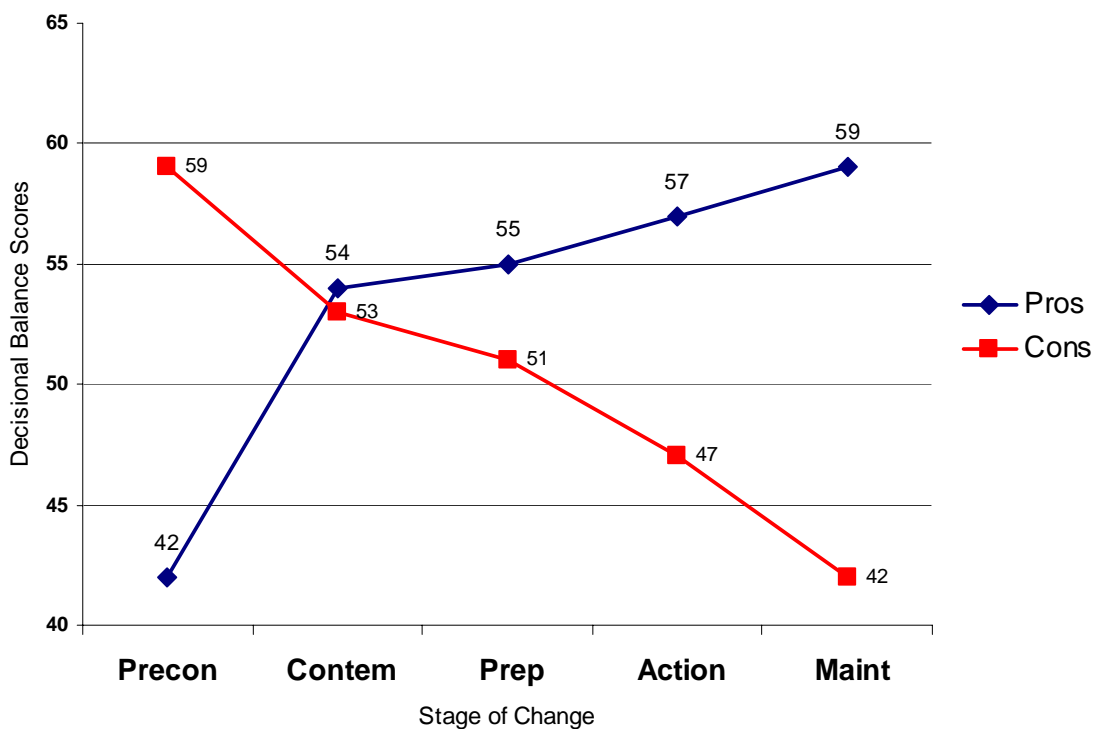
of attempting to stop smoking. This discovery that a two scale model could successfully differentiate between stages of change simplified the process of assessing decisional balance.

A consistent and systematic relationship between a two-scale assessment of the perceived equilibrium of the advantages and disadvantages of making a change, decisional balance, and stage of change an individual is in is consistently observed (Prochaska, Velicer, Rossi, Goldstein, Marcus, Rakowski, Fiore, Harlow, Redding, Rosenbloom, & Rossi, 1994). This relationship is observed in behaviors including smoking cessation, quitting cocaine, weight control, high-fat diets, adolescent delinquent behaviors, safer sex condom use, sunscreen use, radon gas exposure, exercise acquisition, mammography screening and physicians' preventives practices with smokers (Prochaska, Velicer, Rossi et al., 1994). Specifically, the "cons," or disadvantages of making a change, outweigh the "pros," or advantages for initiating a change at the precontemplation level. These two measures tend to be equally weighted at the contemplation stage. However, in this stage, the weightings of pros and cons tend to "cross," as weighting for the pros begins to outweigh those of the cons. Following the contemplation stage, into the preparation, action and maintenance stages, measures of the pros outweigh the cons.

Prochaska (1994) validated two principles for stage progression as quantified through decisional balance measures. The strong principle shows that progression from precontemplation to action is a function of approximately a one standard deviation increase in the pros of a health behavior change. The weak principle shows that progression from precontemplation to action is a function of approximately a half

standard deviation decrease in the cons of a health behavior change. Though the pattern of how the pros and cons relate to stage of change vary somewhat depending upon whether the change involves an unhealthy or a healthy behavior (Velicer, Prochaska, Fava, Norman, & Redding, 1998), Figure 4 below displays the general relationship between decisional balance and stage of change.

Figure 4. Classic relationship between decisional balance and stage of change.

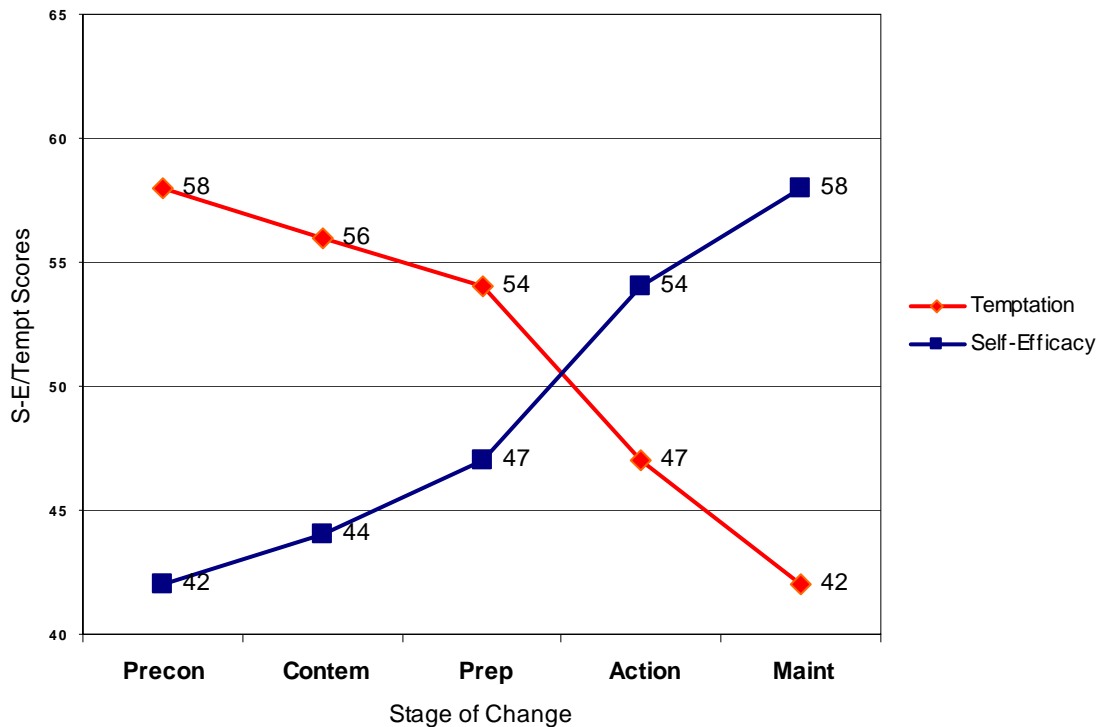


A second factor that has been quantitatively assessed as impacting an individual's movement between stages is the equilibrium between an individual's feelings of power and impotence relative to the change in question (DiClemente, 1981). This equilibrium is conceptualized as the third core construct – self-efficacy/temptation.

Self-Efficacy

This core construct of TTM encompasses two distinct yet interrelated constructs – self-efficacy and temptation. Both of these constructs are quantifiable and display consistent relationships within the stages of change (DiClemente, 1986; Plummer, Velicer, Redding, Prochaska, Rossi, Pallonen, & Meier, 2001). Self-efficacy, adapted from the work and theory of Bandura (1977, 1982) and then applied within the framework of TTM, is defined as the degree to which individuals believe they have the situation specific capacity to attain a desired goal or cope with a high risk situation. The construct of temptation is conceptualized as the inverse of self-efficacy. It is the degree to which an individual feels they would be enticed to not initiate or maintain a change, particularly when in difficult situations (Velicer, DiClemente, Rossi, & Prochaska, 1990). Measures of both self-efficacy (DiClemente, 1981) and temptation (DiClemente, 1986), as applied within the context of TTM, have been developed. As with decisional balance, levels of self-efficacy and temptation have been found to vary systematically across stages of change. Individuals in the latter stages of change report higher levels of self-efficacy and lower levels of temptation to relapse or not engage in the change (DiClemente, 1981; DiClemente, Prochaska, & Gibertini, 1985; Levesque, Prochaska, & Prochaska, 1999). More specifically, self-reports of temptation tend to outweigh reports of self-efficacy in the first three stages of precontemplation, contemplation and preparation. Around the preparation stage and into the action and maintenance stages, reports of self-efficacy outweigh reports of temptation (Velicer, Prochaska, Fava, Norman, & Redding, 1998). Figure 5 below displays the general relationships between self-efficacy, temptation and stage of change.

Figure 5. Classic relationship between efficacy and stage of change.



The stages of change allow insight into and an understanding of when individuals are most likely to make changes. Decisional balance and self-efficacy/temptation provide a method for quantifying some of the internal mechanics that are driving movement through the stages. The final core construct of TTM, the processes of change, enable greater perspective into how movement through the stages of change are facilitated and occur.

Processes of Change

Change processes are covert and overt activities and experiences that individuals engage in when they attempt to modify problem behaviors (Prochaska, DiClemente, & Norcross, 1992). They are fundamental practices and methods that individuals may use to facilitate movement from one stage of change to the next

(Prochaska & DiClemente, 1984). Change can be difficult and individuals experiencing change often experience a “groan zone” of discomfort around the change, at least until the change has reached its ending point (Luckner & Nadler, 1997). The processes of change posited within TTM represent tools and methods for potential use to encourage, facilitate or elicit movement through the stages of change. The 10 fundamental processes posited by TTM were originally distilled by Prochaska (1984). These 10 processes have since been refined through further analysis and their relationships to the stages of change empirically defined (Prochaska & DiClemente, 1983; Prochaska, Velicer, DiClemente, & Fava, 1988; DiClemente, Prochaska, Fairhurst, Velicer, Velasquez, & Rossi, 1991).

The processes of change are generally defined as follows (Prochaska, Norcross, & DiClemente, 1994; Levesque, Prochaska, & Prochaska, 1999):

1. Consciousness raising – Increasing awareness and gathering information to develop an understanding about the causes, consequences and cures for the problem behavior
2. Dramatic relief – Experiencing and expressing feelings about the problem behavior and potential solutions, potentially leading to reduced affect if appropriate action is taken.
3. Environmental reevaluation – Consideration and assessment, at both the cognitive and affective level, of how the problem behavior affects the physical and social environment of the individual.
4. Social liberation – Awareness, availability and acceptance by the individual of alternative, problem-free lifestyles in society.
5. Self-reevaluation – Emotional and cognitive reappraisal of values by the individual with respect to the problem behavior and how the problem behavior impacts the individual's self-image.
6. Self-liberation – Choice and commitment to change the problem behavior, including belief in the ability to change.

7. Reinforcement management – Rewarding oneself or being rewarded by others for making changes.
8. Helping relationships – Trusting, accepting and utilizing the support of caring others during attempts to change the problem behavior.
9. Counterconditioning – Substituting new, healthy behaviors and cognitions for the old ways of working or problem behaviors.
10. Stimulus control – Control of situation and other causes which trigger the problem behavior, typically involving the removal of cues for unhealthy habits and adding prompts for healthier alternatives.

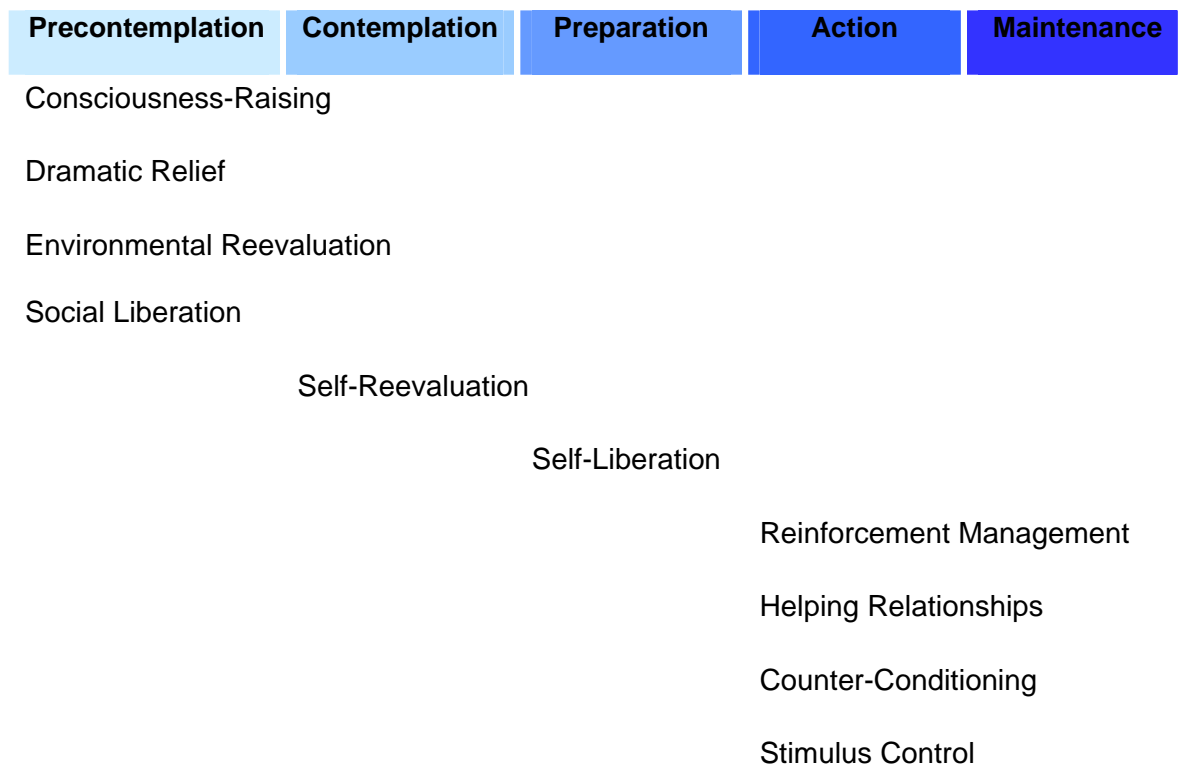
Research has shown that successful change employs different processes at each particular stage of change (Prochaska, Velicer, DiClemente, & Fava, 1988) and the processes have been successful predictors of change in therapy (Prochaska, DiClemente, & Norcross, 1992). The use of specific process of change at unique stages in the change process creates an important distinction – stage matched change interventions versus more general, action-oriented change interventions.

Stage-matched Interventions

Change initiatives display greater levels of success if they facilitate individuals' movement through specific stages of change when compared to action-oriented, one-size-fits-all programs (Levesque, Prochaska, & Prochaska, 1999). This is primarily achieved by applying the processes of change best suited for moving the individuals from their current stage of change into the next. Change interventions that attempt to “match up” the stage of change individuals are currently in with particular processes of change have a greater impact than a haphazard implementation of change processes intervention. For example, stage-matched interventions for smokers more than double the smoking cessation rates of the best traditional interventions (Prochaska,

DiClemente, Velicer, & Rossi, 1993). Figure 6 outlines the processes of change, by stage, best suited to facilitating movement towards a decision to implement a change (Prochaska, Norcross, & DiClemente, 1994).

Figure 6. Processes and stages of change.



Take, for example, an individual who wishes to quit smoking. If the individual sees no need to change (precontemplation stage), then establishing relationships with others who have quit smoking (helping relationships) or replacing the smoking behaviors with jogging (counter-conditioning) will likely not be effective, as these processes have shown to be most beneficial for an individual in the action or maintenance stages. However, for this person to begin moving towards thoughts of ceasing her/his smoking habit in the near future (the contemplation and preparation stages), interventions such as providing information on the long term negative effects of

smoking (consciousness raising) or considering how the smoking habit may be impacting his/her work relationships (environmental reevaluation) would typically be most appropriate. In summary, the differential employment of selected change processes at strategically critical times in the course of change increases the probability of a successful change effort (Prochaska, Norcross, Fowler, Follick & Abrams, 1992).

Synthesis

Approaches to organization change seem to lack a focus on how change occurs at the level of the individual employee. Numerous psychological theories of individual change provide insight into potential applications for facilitating individual level behavior change. Specifically, TTM provides an integrative model of individual behavior change and tools for facilitating the change process. TTM could potentially be applied in an organization, increasing the probability of change initiatives' success by assisting in the understanding of and approach to how individuals choose to make changes in behavior (Prochaska, Prochaska, & Levesque, 2001). This is important as, though the ultimate goal is to bring about changes that are widespread, extending to the organization as a whole, organization change initiatives necessitate alterations in behavior at the individual level (Miner, 1992).

Past Use of Psychological Models in Organization Change Theory

Applying principles from other fields into organizational theory is not new. Psychology, in particular, has historically provided insight into the mechanisms underlying organization change, as it should given the field's focus on human behavior and the need for behavior alterations in organization change initiatives (Winum, Ryterbrand & Stephenson, 1997). Van De Ven and Poole (1995) cite evidence that

organization change theories have taken their cue from a range of psychological disciplines and theorists including Freud's psychotherapy and Piaget's child development theory. Barker and Barker (1996) explore the application of an Alderian approach to managing organizational change by applying his model to interactions with individuals in a case study of managing change in a health care organization.

Psychological aspects of organization change have also been acknowledged in empirical studies. Guzzo, Jette and Katzell (1985) examined the effects of multiple psychologically based organizational interventions on productivity. The interventions included recruitment and selection, training and instruction, appraisal and feedback, management by objectives, goal setting, financial compensation, work redesign, decision-making techniques, supervisory methods, work rescheduling, and socio-technical interventions. Organizational productivity was operationally defined as three components: output, withdrawal and disruptions. Across the 98 studies included in the meta-analysis, the interventions significantly improved some measurable aspect of organizational productivity by nearly one-half of a standard deviation.

That organization change theory has drawn from psychology is evident. However, the degree to which psychological principles have truly been applied in change efforts is questionable. In fact, Winum, Ryterbrand and Stephenson (1997) propose that a leading indicator of a change effort's failure is the deliberate or incidental ignorance of basic psychological principles of change. This ignorance may lead to the violation of fundamental guiding principles for how human beings tend to process and assimilate change into their lives, lessening the probability of a successful organization change effort. To address this potential shortcoming, the authors propose a

“psychologically informed” model of effective organization change. Their model involves three steps – defining the challenge, working through the change, and attaining and sustaining improvement. Each stage identifies specific actions that can be taken, which subsume learning about humans and how they change, including gathering data on the costs of maintaining the current status, creating a vision and creating new visions of success throughout the organization. TTM offers another psychologically based model for attempting to capture the dynamics of individual level human change for application in organization change.

Linking Individual and Organization Change

In a change initiative designed to impact an entire organization, employees typically need to behave differently for change to occur in an observable and measurable fashion (Barker & Barker, 1996; Winum, Ryterbrand, & Stephenson, 1997). Organizational situations may also generate emotional responses depending on the ways in which they are read (Antonacopoulou & Gabriel, 2001). If so, then an understanding of individual reactions to change, and the emotions it engenders, could provide useful insight for facilitating an organization change process. Richard Boyatzis amplifies this point, emphasizing the importance of individual change in applied settings. Without helping individuals to change, Boyatzis proposes that it is hard to get an organization system to change (Wheeler & Hall, 2003).

As evidence to this point, Robertson, Roberts and Porras (1993) report a positive relationship between individual behavior change and organization change outcomes. The authors conducted a meta-analysis of published studies describing organizational interventions containing quantitative data on measures of outcomes. Organizational

interventions included organizing arrangements (e.g., flextime, incentive programs), social factors (e.g., team building), technology (e.g., job enrichment-redesign), and physical setting (e.g., change to an open office plan). Dependent variables assessed included work setting, individual behavior or organizational outcomes. The relationship between individual behavior and organization change outcome was significant and positive. The authors note the need to evaluate individual behavior more frequently and explicitly, which is often not explored in studies of large-scale change projects.

Thoughts and research of this sort lend credence to the idea that organization-wide change inherently involves behavior change at the individual level. Taken to its logical conclusion, this premise holds that organization change, at any level, will not occur without fundamental behavior change occurring at an individual level within employees (Whelan-Berry, Gordon, & Hinnings, 2003), as change must begin at the individual level for it to be “felt” at the greater group or organizational level (Porras & Robertson, 1992). Therefore, the goal of change agents in organization change initiatives should include the facilitation of employee behavior alterations. TTM potentially offers a model of individual change that would assist change agents in the accomplishment of this goal.

Use of TTM in an Organization

TTM has begun to be applied both in the workplace and to workplace behaviors. The relationships between TTM constructs within organization change behavior has been preliminarily examined by Prochaska, Prochaska and Levesque (2001) in studies of readiness for a merger/acquisition, readiness to participate in high-performance teams, readiness for managed care, readiness to purchase software, readiness to use a

stage approach to organizational change by change consultant and readiness for continuous quality improvement in hospital administration. The processes of change have also been applied to organization interventions such as attempts to influence alterations in leadership style (Scholl, 2000) and in assessments of both the processes and stages of change in a work site weight control program (Prochaska, Norcross, Fowler, Follick and Abrams, 1992). Individuals engaging in the weight control treatment program did shift from the contemplation to action stages at a statistically significant rate, providing initial evidence of the applicability of TTM in an organizational environment, though not to behaviors that occur specifically within the context of the work setting.

Levesque, Prochaska and Prochaska (1999) applied TTM in a university setting. The university was in the process of integrating service delivery to students by altering their method of service delivery from their current processes. The university's project planning team for the initiative collaborated with the researchers to examine the applicability of TTM and its ability to facilitate employees' transition from the current service delivery process into the new method. As part of this work, thirty-one members of university staff on the project team completed assessment instruments measuring core constructs of TTM. The data gathered provided evidence of the applicability of TTM to an organizational initiative. Specifically, stage of change displayed characteristic relationships to the decisional balance measures and the use of behaviors relevant to integrated service delivery. The cons of getting involved in the new program outweighed the pros in the early stages, and the pros outweighed the cons in the later stages, with the crossover taking place before the action stage.

A second foundational piece of research relative to the application of TTM in an organizational setting occurred within a population of family service agencies providing counseling services in the United States (Prochaska, 2000). Prochaska examined the core constructs of TTM and their relationship to the agencies' attempt to initiate time-limited therapy in response to the needs and demands of managed health care in the 21st century. Representatives from 184 Family Service America member agencies were asked to respond to a survey containing TTM relevant items that had been modified to fit the context of the agencies' changing to a time-limited therapy approach. A series of MANOVAs and follow-up analyses compared groups representing each stage of change. Each of TTM core constructs was found to have systematic relationships with the stages as predicted by TTM, providing further evidence for the application of TTM in an organizational setting. The cons of changing were higher than the pros in the precontemplation stage and the opposite was true for agencies in the action stage. The crossover between the pros and cons occurred near the contemplation stage. Prochaska observed a greater than one standard deviation change for the pros between the precontemplation and action stages and a greater than one standard deviation change for the cons between the precontemplation and contemplation stages. The author concludes by suggesting future research expand upon and reinforce these findings in differing types of organizations.

If research with TTM in organizations continues and consistently shows the hypothesized patterns, TTM could establish a "common language" relative to employees within organization change theory. This could positively impact the quality of research by facilitating communication between researchers and potentially leading to

the foundation of “invisible colleges,” defined by Pfeffer (1993) as dense networks of researchers crossing university boundaries. Consensus is a vital component for the advancement of knowledge in a field, as it enables replications of studies and a dialogue between researchers and practitioners. The goal of an effective model of individual level change within organizations would be to establish a useful means of explaining, diagnosing and facilitating employee reaction to and acceptance of organization change.

Research Rationale

There is limited attention paid to how employees experience and incorporate organization change into their everyday behaviors. TTM offers a potentially viable model for understanding employee reaction when implementing change initiatives. It also offers set processes for facilitating employee movement through the stages of change. If employee behavior change underlies successful organization change, movement of employees into the latter stages of change increases the probability of an initiative’s success. For TTM to potentially serve as a member of organization change theory, its constructs and their relationships would need to be replicated in research and in an organizational environment. Unfortunately, data displaying these relationships is, at this time, limited. The fundamental goal of this research is to add to the body of research and data illuminating these constructs’ relationships in an organizational context.

Hypotheses

In research conducted with TTM on health-related behavior changes, the core constructs display consistent and systematic relationships. It is anticipated that these constructs will display the same pattern of relationships when assessed with individuals

engaged in work-related behavior change in an organizational environment. The change initiative to be assessed is still in the preliminary stages of development, and no employees have been actively involved in the full-fledged program and its subsequent behavior changes for an extended period of time. Individuals in a precontemplation stage recognize no need for change. Those in the contemplation stage acknowledge a change to be potentially undertaken. Individuals in a preparation stage combine intent to change with small behavioral changes. Finally, those in the action stage will actually modify, or change, their behavior. Because the change is in its preliminary stages and few employees have been directly involved in the initiative, it is anticipated that most employees will be in the first two stages of change. Therefore:

Hypothesis 1

It is hypothesized that a majority of the individuals will be in the precontemplation and contemplation stages of change. Specifically, approximately 35% of the participants will fall into both the precontemplation and contemplation stages, with the remaining 65% of participants equally distributed into the other two stages of preparation and action.

It is posited that TTM core constructs will display the same basic psychometric properties in an organizational setting and with work-related behaviors that it does with health-related behaviors. To that end, measures of decisional balance and efficacy were developed to assess these patterns. Past research has indicated that each of these two constructs can typically be refined into two-factor measures. Decisional balance is intended to assess the perceived advantages (pros) of behavior change and the perceived disadvantages (cons) of behavior change. Efficacy is intended to assess an

individual's levels of self-efficacy relative to their ability to initiate and maintain the specific behavior change and temptation to not engage in or maintain the behavior change. Each of the four sub-scales is independently assessed by the survey instrument (Appendix A).

The primary decision at this point was whether a confirmatory or exploratory approach was more appropriate when examining the factor structures of the measures. Reviews of past research measures, professional guidelines and processes, as well as subject matter expert input contributed to the face and construct validity of the measures. However, as this is the first application of the decisional balance and efficacy scales, with this specific type of behavior change and in this type of environment, previous psychometric evidence for these scales and their potential for two factor solutions is non-existent. Because of this, expectations as to exactly how many factor each measure would possess and which variables would load onto which factors were tentative and an exploratory approach therefore adopted. The supposition is, until evidence proves otherwise, any scale item could, ultimately, be associated with any number of factors. The goal then became to begin the process of uncovering the underlying structures of the decisional balance and efficacy measures when used in an organizational environment.

For this reason, an exploratory PCA was used to conduct a preliminary examination of the factor structures for the measures, with the hopes of uncovering a two-factor solution. This approach using PCA is seen across TTM research, in multiple peer-reviewed journals and in multiple settings (Mannock, Levesque, & Prochaska, 2002; Prochaska, 2000; DiClemente & Hughes, 1990; Prochaska, Velicer, Rossi,

Goldstein, Marcus, Rakowski, Fiore, Harlow, Redding, Rosenbloom, and Rossi, 1994; Robbins, Levesque, Redding, Johnson, Prochaska, Rohr, & Peters, 2001). Given the novel nature of the present research and its construct measures, a confirmatory model may be presumptive and, furthermore, provide results under-estimating the quality of factor structures within the measures. In addition, factor structures observed in exploratory approaches may tend to fit poorly in confirmatory follow-up studies (Van Prooijen & Van Der Kloot, 2001). This may be due in part to confirmatory models' sometimes imposing overly stringent criteria. It is important to ensure that the four constructs within the decisional balance and efficacy measures are conceptualized within this organizational environment and with these specific behavior changes as they are in other research areas. That is, that each of the measures represents distinct constructs, and each pair within the decisional balance and efficacy models display a two factor structure.

For a confirmatory model to be most appropriate there should ideally first exist preliminary findings that the constructs exist in essentially the same structure the researchers seek to confirm. If particular measures have previously shown a structure in past research and/or across multiple studies, a confirmatory model becomes suitable. TTM-related research incorporating more confirmatory and structure modeling types of approaches to factor analysis, as opposed to exploratory models, have primarily occurred when previous research conducted has established preliminary structure models. These studies have been conducted across time and measures of the core constructs have proven to be robust in multiple replications (Redding & Rossi, 1999;

Plummer, Velicer, Redding, Prochaska, Rossi, Pallonen, & Meier, 2001; Rossi, Greene, Rossi, Plummer, Benisovich, Keller, Velicer, Redding, Prochaska, Pallonen, & Meier, 2001; Velicer, DiClemente, Rossi, & Prochaska, 1990). TTM research incorporating more exploratory models has occurred when the scales in use are new, the behavior to be examined is novel or the setting of the behaviors is unique.

The present measures are new, applied to novel behaviors and in a unique setting. They have not received foundational analyses prior to the current research that is typically seen in research incorporating a confirmatory approach. Because of this, there is no direct evidence of the potential factor structure of these constructs in this setting, with this set of behavior. Therefore, the precise make-up of the constructs is not known. This is particularly important with the pros and cons scales, as the perceived advantages and disadvantages of an organization change may prove to be hard constructs to finalize or display a more complex factor structure than anticipated, given the relatively new nature of the change being introduced and the range of initial employee responses to these changes. Therefore:

Hypothesis 2

The decisional balance and efficacy measures should display a two factor model, with no cross-loading of items across the two factors, in an exploratively obtained PCA.

Based upon previous research, it is anticipated TTM will display the same basic relationships between stage and core constructs across individuals in an organizational setting and with work-related behaviors as it does at the individual level and with health-related behaviors. Specifically, the pros and cons scales in the decisional balance

measure will display the systematic relationship across the stages of change commonly observed in TTM literature. Therefore:

Hypothesis 3

It is hypothesized that the balance of pros and cons will be systemically related to the stage of change the group is in. Specifically, the cons will outweigh the pros at the precontemplation level. The pros and cons will not significantly differ at the contemplation stage. Finally, the pros will outweigh the cons at the preparation and action stages. Though statistically significant results are desired, it will remain important for the trends in the decisional balance measures to be examined across the stages. Figure 1 provides a graphic display of the hypothesized relationships.

Based upon previous research, it is anticipated TTM will display the same basic psychometric properties across individuals in an organizational setting and with work-related behaviors that it does at the individual level and with health related behaviors. Specifically, the scales of self-efficacy and temptation in the efficacy measure will display the systematic relationships across the stages of change commonly observed in TTM literature. Therefore:

Hypothesis 4

It is hypothesized that the balance of self-efficacy and temptation will be systemically related to the stage of change the group is in. Specifically, the level of temptation will outweigh that of self-efficacy at the precontemplation and contemplation stages. The measures of self-efficacy and temptation will not significantly differ at the preparation stage. Finally, the measures of self-efficacy will outweigh those of temptation in the action stage. Though differences in the self-efficacy/temptation

measures across the stages will be assessed, statistically significant results need not be achieved for the typical trends to be observed. Figure 2 provides a graphic display of the hypothesized relationships.

METHODS

Context and Participants

The purpose of data analysis is to add to the body of evidence speaking to the applicability of the transtheoretical model of change (TTM) in explaining and facilitating the understanding of how individuals incorporate organization change into their personal behaviors. Per Prochaska's (2000) note that organizational applications of TTM should be investigated in multiple environments, data collection occurred in a non-profit organization. The participating organization was the water department of a large city in the American southwest. The water department designed a maintenance management program (MMP), a structured process to implement substantial improvement in the manner that operations and maintenance (O&M) functions were performed. The main component in achieving substantial improvement to the department included a reduction in O&M costs, more responsive customer service and higher water system reliability. In order to achieve these improvements, three areas were identified for optimization: organization change; practice improvement; and technology.

To further the development of optimized business practices, a cross-trained, or multi-skilled, employee was desired by the water department. This multi-skilled worker would be trained in job skills that crossed boundaries created by the current job classifications. These proficiency sets from across formerly "siloes" classifications included skills, knowledge and abilities relative to operations, maintenance and distribution duties within the water department. With cross-training of this sort occurring, the current method of compensating employees, based upon the job title and market rates for those job titles, was deemed to no longer reflect the true nature of the multi-

skilled position. Therefore, the department explored alternative options for compensating these employees. To attain complementary work practices and compensation plans, the use of a skill-based pay (SBP) system was desired by the department. The intent of the department's SBP program is to provide career development and a career path for craft workers and to reward these employees for broadening their skill sets through increased compensation.

The author was involved in assisting in the development and finalization of a SBP compensation system for employees participating in the new multi-skilled classification within the water department. The author approached the department, asking for permission to collect data as part of ongoing research the author was conducting. The department agreed and written verification of this permission was obtained.

As part of the SBP development process, an organizational readiness (OR) survey was distributed. The OR survey is used to help determine if the department's current practices are appropriate for SBP. OR surveys are used to: a) identify behaviors currently in use by individuals, or the organization as a whole, that are conducive to SBP and b) isolate potential problem areas that might hinder the development of the SBP program and that need to be addressed as the process proceeds. Data collected for TTM research was included in the OR survey, with the participating organization's full knowledge and permission. The survey was distributed to employees who were potential participants in the organizational change initiative being undertaken. All participants in the survey were provided with informed consent, in written, verbal, and presentation formats.

Participants in the study were full time employees of the water department. A total of 118 employees completed the survey. All participants were male, with tenures in the organization ranging from 6 months to over 40 years. The participants ranged in age from 17 (just out of high school) to nearing retirement (approximately 60 years old). Participants held both supervisory and nonsupervisory positions in a range of job classifications focused on the maintenance of water equipment, distribution of water to the city, and operations of water functions.

For the purposes of this study, the change being initiated was operationally defined as participation in the (MMP) SBP program. The SBP program represents a state of daily operations and behaviors which will occur upon complete initiation of the MMP system, with compensation in this function driven by the SBP system. The MMP program was currently being piloted by a small group of employees, who were considered part of the participant pool for this study.

Procedure

An important part of the research process was the on-going communication between the author and appropriate representatives from the water department. Information relevant to the research in this paper was discussed with the department throughout the project. Additionally, and in return for their participation, the department was provided with a preliminary summary report of the research, including specific applications of the research relevant to the department's efforts.

TTM measures were delivered, through the OR survey, to all employees involved in the change initiative directly or who would be eligible for participation in the change initiative. Numerous employee meeting sessions were scheduled at various water

department locations over multiple days. Multiple communications were engaged to make employees aware of the sessions, session times and locations. Modes for communicating meeting schedules included email announcements, supervisory communications and announcements through regularly scheduled communications such as employee newsletters and meetings. Supervisors were encouraged by department management to make time for themselves and their employees to attend. Also, employees who attended the sessions were asked to encourage their fellow employees to come to any of the remaining scheduled sessions.

Each of these employee sessions consisted of three parts. The first part was a 20-25 minute presentation on the change initiative and its development process to be used within the water department. The second part of each session was a time allowed for employee comments, questions and concerns regarding the change initiative. Finally, each session concluded with the distribution and collection of the survey, which contained TTM items. As the survey was distributed, instructions were given on the completion of the survey. Furthermore, employees were assured that all responses to the survey would be both confidential and anonymous and the informed consent portion of the survey was verbally reviewed. Most importantly, the informed consent language contained on each survey was reviewed verbally with the employees and each employee was also asked to read the information carefully before completing the survey.

Measures

Development of Measures

Scale development of TTM measures is adapted from the procedure outlined by Levesque, Prochaska and Prochaska (1999).

1. Identify and define target behavior changes – A thorough assessment of current employee and organizational needs was conducted in order to develop a clear, behaviorally oriented understanding of the change the water department was undertaking. This was necessary in order to develop an operational definition of the “change” and to develop TTM measures particular to this organization and its situation. The author was provided with extensive documentation on the department’s current operations and relevant city ordinances and policy and administration documents. Additionally, relevant information to the current MMP program was also provided, including summaries and overviews of the entire project, project timetables, project/costing charts and other documentation relevant to the program’s initiation. To develop a more accurate understanding of the jobs being incorporated into this system and the work done within these jobs, the author spent approximately four full days touring departmental facilities and interviewing department employees on job functions and responsibilities. The tour and interviews were facilitated by a long tenured water department employee who possessed extensive experience in each of the three “siloed” work functions being combined into the multi-skilled technician. This time included direct observations of work functions, water department facilities and equipment and ongoing conversations with the SME facilitating the tour.

2. Customize TTM measures – Measures used to assess the various core constructs of TTM in relation to the change initiative were developed, to be included in the OR survey distributed as a regular part of the SBP development process. These measures were tailored for specificity to their use in this project to assess employees' readiness for the change. The author first asked for subject matter expert (SME) input relevant to the measures being developed. Specifically, the author reviewed the documentation provided and probed further to gain a full understanding of timelines for the project and current employee status relative to the project (for the stage of change measure). The SME's were then asked to provide their input into the perceived advantages and disadvantages of the current system (for development of the decisional balance measure) and situations in the current program that might either further encourage and support participation or tempt employees not to participate in the program (for development of the efficacy measure). SME's included current and previous job incumbents, water department project team members and input from the general employee population garnered through employee meetings conducted as a function to the earlier stages of the MMP program transition. Details for each measure and proposed statistical analyses of the scale properties are discussed further below.

Stage of Change

When applying TTM to a new target area, researchers have typically focused on stages, pros and cons of change and their interrelationships (Levesque, Prochaska and Prochaska, 1999). This study will include an examination of these interrelationships and will also include an analysis of the efficacy measures. At the time that TTM data was collected, the water department had begun the process of moving to multi-skilled

technicians and a SBP environment. The last stage of change, maintenance, was not assessed as no employees have yet participated in the new system being initiated for an extended period of time. Therefore, only the first 4 stages were assessed, to determine, out of those employees potentially eligible for participation in SBP, the percentage of employees in each stage of change. Employees participating in the survey indicated their stage of changes by responding to an item asking for their situation relative to SBP. The item begins by asking “Given your role in the water department, please circle the one statement that most closely describes your situation.” Employees who stated they had no intention of becoming involved in SBP were classified as being in the precontemplation stage; those who intended to become involved in the next several years were classified as in contemplation; those who intended to become involved in the next year were classified in preparation; those who had been involved in the MMP pilot were classified as being in the action stage. Due to the extended timeframes of the organizational initiative in question, the time frame for the staging item were altered to more accurately reflect the current realities of the MMP change initiative. An algorithm-based approach to staging is robust across behaviors and populations (Prochaska, Velicer, Rossi, Goldstein, Marcus, Rakowski, Fiore, Harlow, Redding, Rosenbloom, Rossi, 1994).

Decisional Balance

The decisional balance inventory (Velicer, DiClemente, Prochaska, & Brandenburg, 1985) was adapted to the MMP/SBP project. To establish construct validity, the adaptation was based on a review of decisional balance measures from other research (Velicer et al., 1985; Prochaska, et al., 1994) and the SME input

provided when customizing TTM measures. Employees were asked to rate the importance of 10 pros (e.g. increase learning opportunities, have more control over level of pay, ability to make more decisions) and 10 cons (e.g. requirement of extra work, large amounts of training to complete, higher levels of accountability) in their decision to become actively involved in the SBP program. Response options ranged from 1 (*not important*) to 5 (*extremely important*).

Efficacy

The efficacy inventory (Velicer, DiClemente, Rossi, & Prochaska, 1990) was also adapted to the MMP project. To establish construct validity, the adaptation was based on a review of self-efficacy/temptation measures from other research (DiClemente, 1981, 1986; Redding & Rossi, 1999; Velicer et al., 1990) and the SME input provided when customizing TTM measures. Temptation and self-efficacy survey items began with the statement “How tempted may you be to not participate in the SBP system in each of these situations?” or “How confident are you that you would continue to participate in SBP in each of these situations?” The opening statements were followed by items for which they were asked to rate their level of temptation or self-efficacy (e.g. when work loads increase, when pay does not increase as quickly as anticipated, when space for training becomes limited). Response options ranged from 1 (*not at all*) to 5 (*extremely*).

RESULTS

Data Screening

Prior to conducting statistical analyses, study data were examined for outliers, missing data, normality, linearity, and adherence to the basic assumptions required by data analytic procedures. None of the data are out of range and no univariate or multivariate outliers were identified. Additionally, descriptive statistics were run to examine univariate outliers and z-scores. Univariate outliers were assessed by examining the z-scores of each item. None of the variables had z-scores greater than 3. As no z-scores met the recommended level of ± 3.29 to be considered an outlier, this is further evidence of the data set's general integrity (Tabachnick & Fidell, 2001). In an examination of the items' descriptive statistics, none had missing values of a quantity greater than 5% of the total, so no follow-up for non-random patterns of missing values was necessary. Missing values in the other variables were dispersed, and for that reason were left in the data set.

Skewness and kurtosis values were examined to identify the relative normality of the data. All skewness and kurtosis values for the entire data set were less than the absolute value of 2, indicative of the relative normality of the data set. In fact only four items, out of 30, had a skewness value of greater than the absolute value of 1 (Con3: 1.160, Pro4: -1.299, Pro5: -1.127; Pro6: -1.019) and only two items had a kurtosis score greater than the absolute value of 1 (Tempt4: -1.243 & Pro4: 1.203). Items were also examined by stage of change for skewness and kurtosis in preparation for meeting multivariate analysis of variance (MANOVA) assumptions of general data normality. In stage 1, all skewness and kurtosis values were less than the absolute value of 2 except

for SelfEff2, which displayed a kurtosis value of 2.506. In stage 2 all skewness and kurtosis values were less than the absolute value of 2 except for Pro5, which displayed a kurtosis value of 2.401. In stage 3 all skewness and kurtosis values were less than the absolute value of 2 except for 3 items with larger kurtosis values (Pro2: 2.726; Pro5: 3.625; Con6: 2.475). Finally, in stage 4 all skewness and kurtosis values were less than the absolute value of 2 except for Pro5, which displayed a kurtosis value of 2.062. Due to the general normality of the data set and relatively low number of items displaying large skewness or kurtosis values, no transformations of the data were performed.

Scale Psychometrics

Scales used in the collection of TTM data were initially examined for their internal consistency and patterns of results. Scale means, standard deviations, correlations, and internal consistency coefficients (Cronbach's alpha) for the four scales used are displayed in Table 4. Overall results were satisfactory for all scales. Three of the scales displayed alpha levels greater than .80 (pros = .89; self-efficacy = .87; temptation = .83) and the alpha level for the final scale approached .80 (cons = .78). As a general rule, internal reliability coefficients of .70 and above are considered acceptable for newly constructed scales (Muchinsky, 1997).

Hypothesis 1

Participant Distribution by Stage of Change

The change initiative assessed in this study (participation in the SBP program) was still in the preliminary steps of its development and initiation. Furthermore, no employees had been actively involved in the full-fledged program, and its subsequent behavior changes, for an extended period of time. Therefore, it was hypothesized that

approximately 35% of the participants would fall into the precontemplation and contemplation stages, with the remaining participants equally distributed into the other two stages of preparation and action. A χ^2 goodness of fit test allows a test of whether the observed proportions of a categorical variable differ from hypothesized proportions. Table 1 displays the χ^2 goodness of fit results and the distribution of study participants by stage of change. Of the 116 total participants, 62 (53.5%) fell into the precontemplation or contemplation stages. These individuals indicated that they had no intention of participating in the SBP system (precontemplation) or were considering participating in the system within the next 6 months (contemplation). The remaining 46.5% ($n = 54$) of the participants were in the preparation or action stages, indicating their present or imminent involvement in the SBP program. The significant χ^2 that reported stage of change in the sample does differ significantly from the hypothesized values ($\chi^2 = 22.342$ (3), $p < .00$). The null hypothesis that the observed proportions do not differ from hypothesized proportions is rejected. Therefore, Hypothesis 1 is not supported.

Table 1

χ^2 Test Examining Participant Distribution by Stage (N = 116)

Stage Coding	Stage of Change	Observed n	Expected n	Residual	Representative %
1	precontemplation	19	41	-21.6	16.4%
2	contemplation	43	41	2.4	37.1%
3	preparation	26	17	8.6	22.4%
4	action	28	17	10.6	24.1%
Total		116	116		100%

$\chi^2 = 22.342$ (3), $p < .00$.

Hypothesis 2

Principal Component Analysis/Exploratory Factor Analysis Measures

It was hypothesized that the decisional balance and efficacy measures would display a robust two factor model, with no cross-loading of items across the two factors, as obtained in an exploratively obtained principal components analysis (PCA).

Principal component analyses (PCA) were performed, using a varimax rotation with Kaiser normalization, for the two scales. The pros and cons scales consisted of 8 items each and contained a usable sample of 118 participants. The self-efficacy and temptation scales consisted of 7 items each and also contained a usable sample of 118 participants. Because this is a first application of these scales, as applied to this change, and in this environment, PCA was used to examine whether or not the scales would possess a differential structure from the typical two-factor structure observed in a majority of the previous research.

For the decisional balance measure, a two component solution was extracted. The proportion of common variance in the variables (Kaiser-Meyer-Olkin = .863) indicates a factor analysis should be successful with the data and the test of sphericity (Bartlett's = 883.361, $df = 120$, $p < .000$) further indicates the probability of significant relationships among the variables. The two components account for approximately 51% of the total variance within the sample. However, the components extracted indicate the scales contain a more complex factor structure than the two factor structure hoped for. There are significant numbers of cross loadings on multiple scale items across both the factors. The failure of multiple variables to load on a single factor reflects heterogeneity

of the items on the pros and cons scales. Therefore, the aspect of Hypothesis 2 relating to the decisional balance measure is not supported. Loadings of variables on factors and percents of variance are displayed in Table 2. Variables are ordered and grouped by size of loading to facilitate interpretation.

Table 2

Pros and Cons Scale Factor Loadings and Percent of Variance

Item	Factor Loading	
	1	2
Pro5	.848	-.041
Pro4	.828	-.161
Pro2	.771	-.161
Pro1	.767	-.107
Pro6	.726	-.342
Pro3	.633	-.204
Pro7	.560	-.435
Pro8	.556	-.460
Con5	.041	.732
Con3	-.027	.701
Con7	-.252	.640
Con8	-.424	.528
Con6	-.429	.526
Con4	-.447	.477
Con2	-.484	.428
Con1	-.168	.415
% of Variance	41.40%	10.01%
Total Variance		51.41%

For the efficacy scales of self-efficacy and temptation, a two-component solution was extracted. The proportion of common variance in the variables (Kaiser-Meyer-Olkin = .752) indicates a factor analysis should be successful with the data and the test of sphericity (Bartlett's = 755.376, $df = 91$, $p < .000$) further indicates the probability of significant relationships among the variables. The two components account for approximately 53% of the total variance within the sample. There are no large cross loadings across the two factors and the anticipated items are each loading onto the

desired scales. Therefore, the aspect of Hypothesis 2 relating to the efficacy measure is supported. Loadings of variables on factors and percents of variance are displayed in Table 3. Variables are ordered and grouped by size of loading to facilitate interpretation.

Table 3

Self-efficacy and Temptation Scale Factor Loadings and Percent of Variance

Item	Factor 1 "Self-Efficacy"	Factor 2 "Temptation"
SelfEff4	.776	-.052
SelfEff1	.774	-.060
SelfEff6	.773	-.132
SelfEff7	.764	-.170
SelfEff2	.721	-.029
SelfEff5	.717	-.219
SelfEff3	.637	-.230
Temptation		
Tempt7	-.046	.800
Tempt6	-.095	.795
Tempt1	-.032	.763
Tempt4	-.088	.740
Tempt5	-.157	.615
Tempt3	-.153	.556
Tempt2	-.326	.519
% of Variance	35.53%	18.10%
Total Variance		53.63%

Table 4 presents the number of items, means, standard deviations, alphas and correlations for each of the scales.

Table 4

Descriptive Statistics for Study Variables

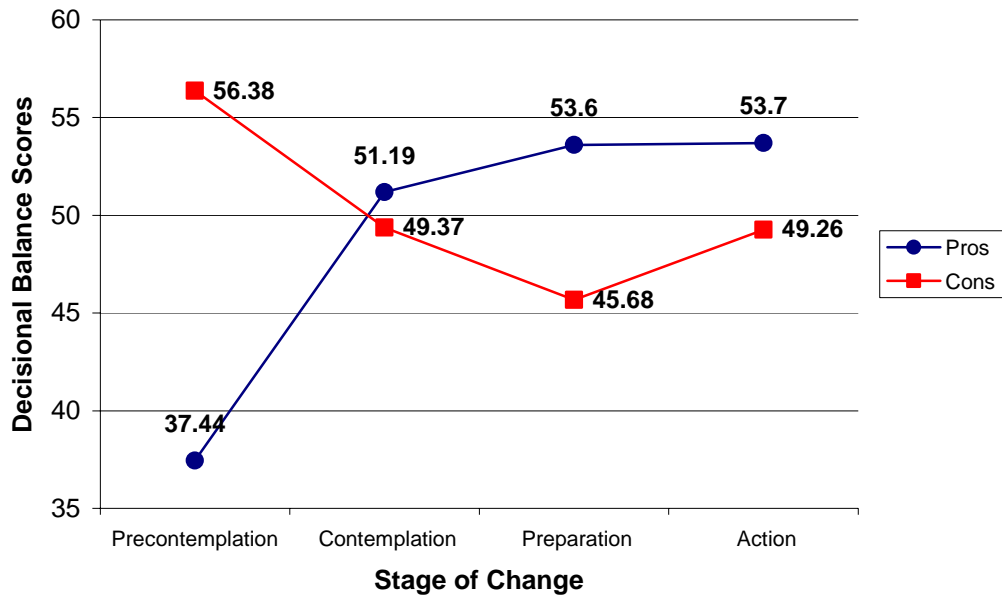
Scale	# of Items	Mean	Standard deviation	Correlations (alpha levels)			
				Pros	Cons	Self-Efficacy	Temptation
Pros	8	28.57	7.04	(.893)			
Cons	8	22.23	6.20	-.648**	(.781)		
Self-Efficacy	7	20.03	6.14	.429**	-.248**	(.871)	
Temptation	7	22.53	6.14	-.149	.169	-.343**	(.825)

Hypotheses 3 & 4

Relationship Between Stage of Change and Measures

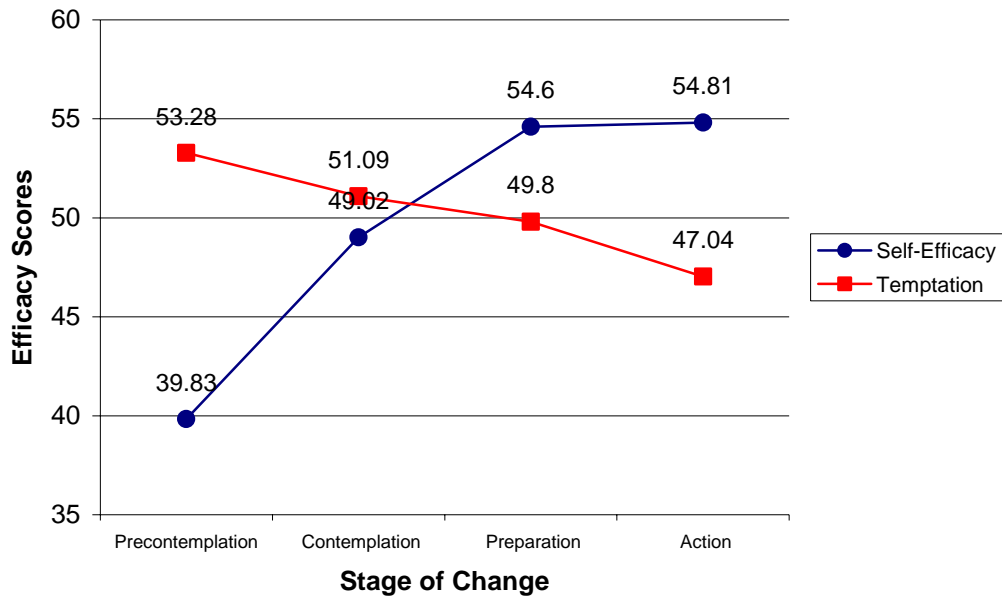
Hypotheses 3 and 4 stated systematic relationships would exist between the stages of change and measures of decisional balance and efficacy. To examine this relationship graphically, the scale response rates were plotted by stage of change. Figure 7 depicts the relationship between stage of change and the decisional balance measure observed in the present study. Figure 8 depicts the observed relationship between stage of change and the efficacy measure in this study. As posited in Hypothesis 3, a visual examination of Figure 4 indicates the balance of the pros and cons scales are systemically related to stage of change. Specifically, the cons outweigh the pros at the precontemplation level. The pros and cons are equally weighted at the contemplation stage. Finally, the pros outweigh the cons at the preparation and action stages. The observed trend of the data follows what is typically seen in TTM research and is one indication of TTM's applicability within an organizational environment. This trend provides preliminary support for Hypothesis 3. Support must be considered tentative at this point due primarily to the lack of independence between the two scales.

Figure 7. Decisional balance scores plotted by stage of change.



As posited in Hypothesis 4, a visual examination of Figure 5 indicates the self-efficacy and temptation scales do seem to be systemically related to the stage of change. Specifically, the level of temptation outweighs that of self-efficacy at the precontemplation and contemplation stages. The measures are closest to crossing near the contemplation stage. Though this trend does not support the specific hypothesis, it does follow the basic pattern of results seen in TTM research and is therefore fundamentally supportive of the hypothesis. Finally, it was hypothesized that self-efficacy would outweigh temptation in the action stage. The observed trend of the data follows what is typically seen in TTM research and is one indication of TTM's applicability within an organizational environment. This trend provides preliminary support for Hypothesis 4.

Figure 8. Efficacy scores plotted by stage of change.



In order to more fully examine the relationship between stage of change and the decisional balance and efficacy measures, two multivariate analyses of variance (MANOVAs) were conducted with stage of change as the independent variable. The first MANOVA contained the pros and cons scales as dependent variables, while the second MANOVA contained the self-efficacy and temptation scales as dependent variables. The total N was 115 for the MANOVA examining the pros and cons scales. The omnibus MANOVA results indicated the dependent variables were significantly affected by stage of change (Wilk's lambda = .615 $F(2, 220) = 10.11, p < .000$). The univariate ANOVAs examining the main effect for stage of change was significant for both the pros ($F(3,111) = 21.171, p < .000$) and cons ($F(3,111) = 5.723, p < .01$), indicating that statistically significant group mean differences did exist within the existing scales across stage of change.

To investigate the impact of stage of change on the pros and cons individually, a Tukey HSD post hoc analysis was performed. Stepdown analysis was not used, as there was no hypothesized relationship between the variables relative to order of entry. Results of the Tukey post-hoc tests (see Table 5) revealed that, for the pros scale, individuals in the precontemplation stage rated the advantages of participating in the SBP program as significantly less important than did those in the contemplation, preparation and action stages. For the cons scale, individuals in the precontemplation stage rated the disadvantages of participating in the SBP program as significantly more important than did those in the contemplation, preparation and action stages.

In the MANOVA examining the temptation and self-efficacy scales, it was determined the combined dependent variables were significantly affected by stage of change (Wilk's lambda = .730 $F(6, 218) = 6.188, p < .000$). The univariate ANOVAs examining the main effect across stage of change was significant for the self-efficacy scale ($F(3,110) = 12.758, p < .000$) but not for the temptation scale ($F(3,110) = 1.818, p = .148$). This indicates statistically significant group mean differences did exist within the self-efficacy scale, but not within the temptation scale.

To investigate the impact of stage of change on the self-efficacy and temptation scales individually, a Tukey HSD post hoc analysis was performed. Stepdown analysis was not used, as there was no hypothesized relationship between the variables relative to order of entry. Results of the Tukey post-hoc tests (see Table 5) revealed that for self-efficacy, individuals in the precontemplation stage rated their confidence in their ability to continue to participate in the SBP program despite distracters significantly lower than did those in the contemplation, preparation and action stages. As the

ANOVAs indicated no significant differences within the temptation scale, the Tukey post hoc analysis was not examined. Though the temptation scale did not reveal statistically significant differences in ratings across the stages of change, the pattern of behaviors displayed in Figure 2 is indicative of typical TTM trend relationships between levels of temptation and stage of change. The statistical results of the MANOVA are summarized in Table 5. Taken in whole, the trends observed and MANOVA analyses provide tentative support for Hypotheses 3 and 4.

Table 5

Multivariate Analysis of Variance for Decisional Balance and Efficacy Ratings by Stage of Change

	PC (n = 18)	C (n = 43)	PR (n = 25)	A (n = 27)		
Decisional Balance					<i>F</i> (3,111)	Tukey HSD ^c
Pros of Changing	37.44	51.19	53.60	53.70	21.171***	PC<C,PR,A
Cons of Changing	56.38	49.37	45.68	49.26	5.723**	PC>C,PR,A
	PC (n = 18)	C (n = 43)	PR (n = 25)	A (n = 27)		
Efficacy					<i>F</i> (3, 110)	Tukey HSD ^c
Self-Efficacy (SE)	39.83	49.02	54.60	54.81	12.758***	PC<C,PR,A
Temptation	53.28	51.09	49.80	47.04	1.818	N/A ^d

PC = Precontemplation, C = Contemplation, PR = Preparation, A = Action

* $p < .05$. ** $p < .01$. *** $p < .001$.

^a A preliminary multivariate analysis (MANOVA) for Decisional Balance measures was significant (Wilk's lambda = .615; $F = 10.11$ (2, 220), $p < .000$), indicating that group means are different.

^b A preliminary multivariate analysis (MANOVA) for Efficacy measures was significant (Wilk's lambda = .730; $F = 6.188$ (6, 218), $p < .000$), indicating that group means are different.

^c Post hoc comparisons were made using the Tukey procedure. Tukey comparisons that were significant are shown using a < symbol.

^d Tukey analysis was not examined in the Temptation scale, as it did not display a significant univariate F -test ($F = 1.818$ (3, 110), $p > .05$)

Decisional Balance Measure Follow-up

The primary results of this study, and the subsequent discussion, will be based on the analyses described above. However, due to the less than ideal structure of the decisional balance measure, an exploratory follow-up was conducted. An attempt was made to eliminate those items cross-loading and develop abbreviated pros and cons scales with an improved factor structure, if possible. Once an abbreviated decisional balance measure was developed, the analyses run above were re-examined with use of these abbreviated scales.

Multiple variations of the pros and cons scales were examined, with differing items retained in the scales. The goal was to create abbreviated scales that maximized reliability while minimizing cross loadings. The version that seemed to best fit this criteria decreased the pros scale to 6 items (Pros 1,2,3,4,5,6) and the cons scale to 5 Items (Cons 1,3,5,7,8).

For the abbreviated decisional balance measure, a two component solution was extracted using, as before, PCA. The proportion of common variance in the variables (Kaiser-Meyer-Olkin = .838) indicates a factor analysis should be successful with the data and the test of sphericity (Bartlett's = 495.496, $df = 55$, $p < .000$) further indicates the probability of significant relationships among the variables. The two components of the abbreviated Decisional Balance measure account for approximately 55% of the total variance within the sample. In this round of analysis, only the item Con 8 still displays a large cross-loading. However, to leave this item out would have significantly lowered the reliability of the cons scale, and so it was left in. The abbreviated scales display better homogeneity on the pros and cons scales than in the

first analysis. Therefore, if using the abbreviated scales the aspect of Hypothesis 2 relating to the decisional balance measure is better supported than in the first analysis. Loadings of variables on factors and percents of variance are displayed in Table 6. Variables are ordered and grouped by size of loading to facilitate interpretation.

Table 6

Abbreviated Pros and Cons Factor Loadings and Percent of Variance

Item	Factor Loading	
	1	2
Pro5	.859	-.003
Pro4	.834	-.153
Pro1	.792	-.109
Pro2	.772	-.107
Pro6	.729	-.287
Pro3	.648	-.216
Con3	-.006	.712
Con5	.000	.709
Con7	-.247	.686
Con8	-.416	.542
Con1	-.161	.475
% of Variance	41.29%	13.91%
Total Variance		55.21%

Once the abbreviated scales were determined, their psychometric properties and relationships with the other scales were reexamined. The descriptive statistics, correlations with all scales and alpha levels for these scales are displayed in Table 7.

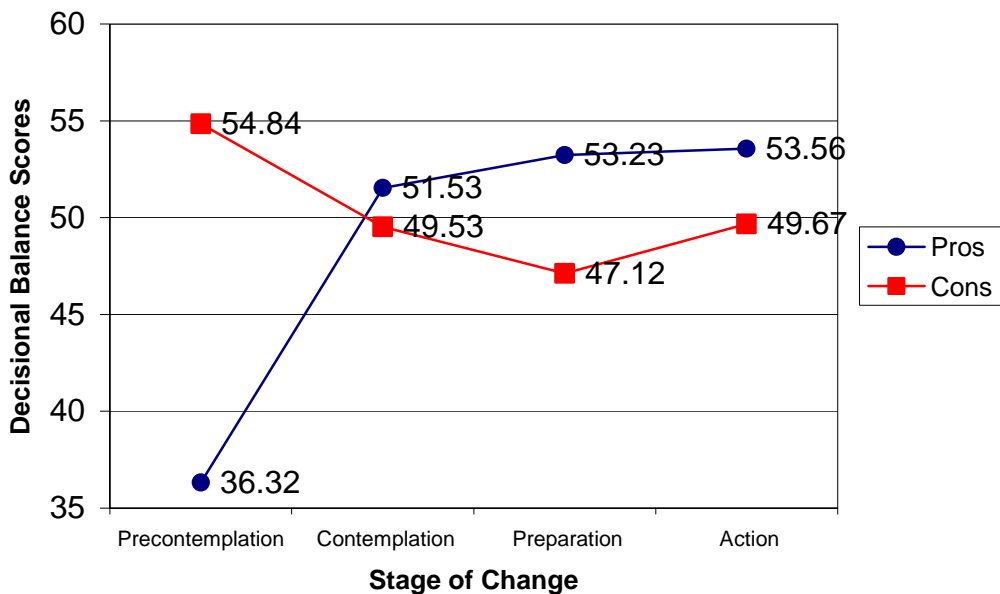
Table 7

Descriptive Statistics for Abbreviated Decisional Balance Measure Correlations (Alpha Levels)

Scale	# of Items	Mean	Standard Deviation	Correlations (Alpha Levels)			
				Pros	Cons	Self-Efficacy	Temptation
Pros	6	21.88	5.43	(.883)			
Cons	5	14.15	4.19	-.442**	(.670)		
Self-Efficacy	7	20.03	6.14	.445	-.133	(.871)	
Temptation	7	22.53	6.14	-.148	.138	-.343**	(.825)

Hypotheses 3 stated systematic relationships would exist between the stages of change and measures of decisional balance. To reexamine this relationship graphically, the abbreviated scale response rates were plotted by stage of change. Figure 9 depicts the relationship between stage of change and the abbreviated decisional balance measure. As posited in Hypothesis 3, a visual examination of Figure 9 indicates the balance of the pros and cons scales are systemically related to stage of change. Specifically, the cons outweigh the pros at the precontemplation level. The pros and cons are equally weighted at the contemplation stage. Finally, the pros outweigh the cons at the preparation and action stages. The observed trend of the abbreviated scale data follows what is typically seen in TTM research and is one indication of TTM's potential applicability within an organizational environment. This trend provides preliminary support for Hypothesis 3. These results approximate those observed when this same analysis was run with the full, cross-loading scales.

Figure 9. Abbreviated decisional balance scores plotted by stage of change.



Finally, a MANOVA was reexamined using the abbreviated pros and cons scales. The omnibus MANOVA results indicated the dependent variables were significantly affected by stage of change (Wilk's lambda = .615, $F(6, 220) = 10.01$, $p < .000$). The univariate ANOVAs examining the main effect for stage of change was still significant for the pros ($F(3,111) = 22.011$, $p < .000$). However, the cons scale ($F(3,111) = 2.429$, $p = .069$), indicated there were no statistically significant group mean differences across stage of change.

To investigate the impact of stage of change on the pros scale, a Tukey HSD post hoc analysis was performed. Results of the Tukey post-hoc tests (see Table 8) revealed that, for the pros scale, individuals in the precontemplation stage rated the advantages of participating in the SBP program as significantly less important than did those in the contemplation, preparation and action stages. These results are identical to those observed when using the full scales. As the ANOVA indicated no significant differences within the cons scale, the Tukey post-hoc analysis was not examined. Though the cons scale did not reveal statistically significant differences in ratings across the stages of change, the pattern of behaviors displayed in Figure 6 is indicative of typical TTM trend relationships between levels of cons and stage of change. These results mirror those observed with the temptation scale. The statistical results of the MANOVA are summarized in Table 8. Taken in whole, the trends observed and MANOVA analysis with the abbreviated decisional balance measure provides tentative support for Hypotheses 3 and 4.

Table 8

Multivariate Analysis of Variance for Abbreviated Decisional Balance Measure by Stage of Change

	PC (<i>n</i> = 19)	C (<i>n</i> = 43)	PR (<i>n</i> = 26)	A (<i>n</i> = 27)		
Decisional Balance					<i>F</i> (3,111)	Tukey HSD ^b
Pros of Changing	36.32	51.53	53.23	53.56	22.011*	PC<C,PR,A
Cons of Changing	54.84	49.53	47.12	49.67	2.429	N/A ^c

PC = Precontemplation, C = Contemplation, PR = Preparation, A = Action **p* < .000.

^a A preliminary multivariate analysis (MANOVA) for Decisional Balance measures was significant (Wilk's lambda = .615; *F* = 10.01 (6, 220), *p* < .000), indicating that group means are different.

^b Post hoc comparisons were made using the Tukey procedure. Tukey comparisons that were significant are shown using a < symbol.

^c Tukey analysis was not examined in the Cons scale, as it did not display a significant univariate *F*-test (*F* = 2.429 (3, 111), *p* = .069)

DISCUSSION

The purpose of this research is to explore avenues for better explaining how individual behavior change occurs within an organizational context. The transtheoretical model of change (TTM) is one potential model for this explanation. TTM describes how individuals choose to make changes in their behavior, as revealed by systematic relationships between the stages of change and measures of core constructs of TTM – decisional balance and efficacy. However, for TTM to be applicable within an organization, it is necessary to ensure its core constructs behave in this context much as it has in other, non-organizational settings. If TTM's core constructs display their typical pattern of relationships, it then becomes possible to begin exploring how TTM might explain individuals' choices regarding behavior change as it relates to their work tasks. The present research examined if the relationships observed in other TTM literature are seen when the change is occurring in an organization and relative to behavior change involving work behaviors. If so, the congruence in relationships would suggest that individuals process, adapt to, and choose to participate in behavior change in an organizational environment in much the same way they do with other behaviors. The general and statistical trends of the results provide initial support for the potential applicability of the TTM within an organizational environment, though not to the extent hoped for.

Behavior change was operationally defined as participation in the organization change initiative. Successful participation in the system necessitated a change in employee's day-to-day work behaviors. For example, those participating would be performing work tasks that crossed traditional job boundaries, completing increased

levels of training and certification, and interacting in multidisciplinary teams, where previously teams were fairly one-dimensional.

The general distribution of employees across the stages of change – precontemplation, contemplation, preparation, and action – did not conform precisely to expectations. 53.5% fell into the precontemplation or contemplation stages. These individuals indicated that they had no intention of participating in the SBP system (precontemplation) or were considering participation within the next 6 months (contemplation). The remaining 46.5% of the participants were in the preparation or action stages, indicating their present or imminent involvement in the SBP program. Though a numerical majority of the employees described themselves as residing within the contemplation and preparation stages, it was anticipated that a larger proportion would be revealed.

Measures of decisional balance displayed the general systematic relationships with stages of change observed across TTM research. As posited, the cons outweigh the pros at the precontemplation level. The pros and cons were equally weighted at the contemplation stage and the pros outweighed the cons at the preparation and action stages. Measures of employee weighting of advantages of participating in organization change significantly increased as an employee progressed through the stages of change. Measures of employee weighting of the disadvantages of participating significantly decreased as an employee progressed through the stages of change. This pattern mirrors the pattern of relationships between these constructs observed in a wide range of TTM research.

Measures of efficacy displayed the same general systematic relationships with stages of change observed across TTM research. Levels of temptation outweigh self-efficacy at the precontemplation and contemplation stages. It was hypothesized the crossing of these two measures would occur near the preparation stage and the measures of self-efficacy and temptation would therefore be equally weighted at the preparation stage. The measures are closest to crossing nearer the contemplation stage. Though this trend does not support the specific hypothesis, it does follow the basic pattern of results seen in TTM research and is therefore fundamentally supportive of the hypothesis.

Finally, as observed, it was hypothesized that self-efficacy would outweigh temptation in the action stage. Measures of employee feelings of efficacy relative to the organization change significantly increased as an employee progressed through the stages of change. Measures of employee feelings of temptation to not participate decreased as an employee progressed through the stages of change. Though the decrease was not statistically significant, the pattern observed was consistent with that hypothesized. These results also mirror the pattern of relationships between these constructs observed in a wide range of TTM research, including smoking cessation, over-consumption of alcohol and the initiation of various health-related behaviors.

Three of the scales displayed statistical significance in scores between stages where differences were expected. In the pros scale, individuals in the precontemplation stage rated the advantages of participating in the SBP program as significantly less important than did those in the other three stages of contemplation, preparation and action. In the cons scale, individuals in the precontemplation stage rated the

disadvantages of participating in the SBP program as significantly more important than did those in the other three stages of contemplation, preparation and action. In the self-efficacy scale, individuals in the precontemplation stage rated their confidence in their ability to continue to participate in the SBP program despite distracters significantly lower than did those in the other three stages of contemplation, preparation and action. These are typical results observed across TTM literature. However, the temptation measure showed limited, non-significant differentiation in scores across the stages of change.

What might explain the lack of support for some of the hypotheses? The distribution of employees indicates a majority were considering, or preparing for, participation in the new skill-based pay (SBP) work and compensation system. This distribution, with many employees still in the early stages of change, was anticipated as the change being initiated was in a transitional stage. However, the larger than expected proportion of employees in the upper stages of change – preparation and action – could be explained by the fact that some employees were already participating in a pilot version of the new program and most employees were aware of the impending full implementation of the initiative. In fact, communications about the change, and how it would alter current practices, had occurred for many months and, in some cases, years. Employees' exposure to the change had also occurred through discussions with those participating in the pilot program, formal presentations, and informal communications. Therefore, it is likely that most employees would possess some knowledge of the change initiative. Because communications relative to the change

initiative were so diverse and robust, it is likely those individuals rating themselves as being in the precontemplation stage are those who, for various reasons, have already chosen not to participate.

Lack of statistical support in some of the measures may be due to multiple factors. First, a clear understanding of how organization change initiatives interact with TTM constructs are not clearly delineated. For example, in health-related behavior change, temptation to not change is affected primarily by personal and social factors. This may differ in an organizational environment. An extension of this is the idea that temptation to change may not display its normal variance due to feelings of lesser control over the situation, as behavior changes are being initiated by employers who hold great financial power over their employees. Second, a focused understanding of perceived advantages and disadvantages of the organization change initiated is difficult in discrete research undertakings. A robust understanding of perceived advantages and disadvantages of specific changes should only improve over time and through repetition. As studies of the same topic are replicated, comprehension of the advantages and disadvantages of a particular change improves, as more specific examples of the pros and cons are validated and adjusted. Third, the sample size of the present study is less than optimal, shrinking the ability of statistical analyses to potentially tease apart subtle, and statistically significant, differences in measured quantities across the stages of change.

Implications of Findings

Theory, or lack thereof, plays an important causal role in the quality of both research and practice within a given field (Campbell, 1990). As the quality of theory in a

field improves, so does the ability of others to apply the theory. However, good theory is a means to an end, not an end in itself. The ultimate goal is to identify models that help organizations to successfully implement change while retaining an appropriate focus on the individual employee. What does the present research say this model may look like? The trends observed between stage of change and TTM constructs are congruent with those observed throughout the literature and are indicative of TTM's potential appropriateness for application within an organizational environment. Furthermore, it suggests TTM measures may be effectively adapted into an organizational context.

The present results indicate people may experience organization behavior change as they do other types of individual behavior change. The relative weightings of the pros and cons for implementing a change and feelings of self-efficacy and temptation are related to the probability of behavior change. As an individual's perceptions of the advantages of a behavior change increase, the more likely they are to physically engage in the change. The larger an individual's perceptions of the disadvantages of a behavior change are, the more likely they are to not implement an alteration in their current behavior patterns. The more confident an individual feels in their ability to initiate and maintain a change, the more probable it is they will do so. If an individual feels they would be strongly tempted to not maintain a change, an alteration in behaviors is not as likely to occur.

This understanding should be incorporated into current organization change theory, adding an individual level of focus typically found lacking. This focus is important in part because macro-level explanations have largely ignored the crucial role of people as the creators and perpetuators of organizations (George & Jones, 2001). Change in

organizations stems from the efforts of its employees, either individually or collectively. These findings are important because an individual's willingness to adopt particular behaviors impacts the probability of a change initiative's success, as might be implicated by the definition of organization change offered by Porras and Robertson (1992).

It has previously been suggested that human capacity to change may limit organizational responses to environmental demands (Morris, 1992). It has been further suggested that behavior change, and the struggle to maintain change, could help to sustain business activities (Beer, Eisenstat, & Spector, 1990). Organization change research and theory has touched upon the impact of individuals, such as the Tavistock Mine study (Duffy, 2003), leading to proposals that change in organization core processes occur only when employees agree to undergo change (Zell, 2003). This presumes that examining the process of change in the organizational or group levels of analysis requires the analysis of change at the individual level. Despite these suppositions, few theories directly address how individual change occurs within an organizational environment (Winum, Ryterbrand, & Stephenson, 1997). Ultimately, organizations are contexts within which individuals behave. Therefore, individual behavior is likely a primary determinant of organizational outcomes such as the level of organizational performance, as past research indicates. Because of this, behavior change should be a primary focus of organization change intervention activity, and TTM offers one tool for addressing behavior change in this context.

Potential Applications of the Research

As TTM provides a model of individual change proving to be functional within an organization, applications of this model should be developed. TTM has the potential to enhance understandings of how and why individuals choose to make behavioral changes in organizations. As further understanding is garnered, increasingly robust attempts to apply TTM within organizations should be undertaken. An immediate application is enabled by the enhanced understanding of the roles of decisional balance and efficacy. Understanding how these constructs interact with stages of change enables the development of change facilitation technologies.

Change initiatives could incorporate processes around these constructs, increasing the probability of success. One avenue for incorporating ideas is through a focus on the perceptions of pros, cons, temptation and self-efficacy by employees relative to the change initiative. For example, communication and design formats that facilitate an employee's understanding of the advantages of the change being undertaken should assist in employees' movement through the stages. Similarly, communications that reinforce employees' ability to successfully engage in the change could also increase the likelihood of full participation. This focus on efficacy also presents an opportunity for change leaders to ensure that appropriate support systems are in place. Appropriate support systems would assist employees in maintaining changes in behavior, thereby increasing the likelihood of the initiative's success.

For example, with the SBP system discussed in this paper, an important support system was training. There was an expressed concern from employees regarding the coverage and quality of training opportunities. Employees who believed that training

would be hard to obtain or complete likely believed it to be harder to maintain a shift into the SBP system. This stemmed from the fact that movement through this system, and subsequent pay increases, were controlled by training obtained. To address the concern about training, the department provided assurance through communications; made announcements when the City Council approved components of the system; and adopted a transparent approach to explanations for how trainings would be funded, organized and staffed. Furthermore, as support systems are initiated and communicated, levels of temptation to disengage for the change initiative's requisite behaviors should decrease as employees move through the stages of change.

Communication and design formats could also work to resolve employee perceptions of disadvantages of change initiatives. For this to occur, effective interactions with employees, the ultimate bearers of any organization change, must be employed to determine what the perceived disadvantages are. This may take the form of surveys, interviews, focus groups, informal discussions, town hall meetings, or some combination of these avenues. Once the perceived disadvantages are clearly understood, change agents may then attempt to dispel misperceptions and adjust change initiatives such that disadvantages are removed. This is just one example of how TTM could be applied. A more thorough understanding of TTM's potential applications can best be addressed through a focused re-visit of the processes of change.

One of the most powerful potential applications of TTM is the adaptation of the processes of change into an organizational environment. In a study discussed earlier (Levesque, Prochaska, & Prochaska, 1999), researchers developed a stage-matched

change management program, customized to the university's employees. Each project team member received individualized process interventions, based upon the team members' stage of change. As part of this effort, basic definitions of the processes were altered and adapted for application in an organizational environment. The adapted definitions of the processes of change were:

- *Consciousness raising* – Increasing awareness and information about the change or its benefits.
- *Dramatic relief* – Experiencing negative emotions associated with failure to change and relief that comes with success.
- *Environmental reevaluation* – Considering how the change will have a positive impact on the social and physical environment.
- *Self-reevaluation* – Considering how one's identity, happiness, and success can be enhanced by the change.
- *Self-liberation* – The belief that one can help make the change happen and commitment based on that belief.
- *Reinforcement management* – Finding intrinsic and extrinsic rewards for new ways of working.
- *Helping relationships* – Seeking and using social support to help with the change.
- *Counterconditioning* – Substituting new, healthy behaviors and cognitions for the old ways of working.
- *Stimulus control* – Restructuring the environment to remove signals for non-participation and add signals for participation in the change.
- *Social liberation* – The organization empowering individuals to participate in the change.

Applying these processes facilitates movement through the stages (Prochaska & DiClemente, 1984). Helping employees to move through the stages of change could subsequently help organizations to increase the probability of an initiative's success. An example application of the processes, based on the above

adapted definitions of the processes of change, took place within the work occurring as data for this paper was collected. In Appendix B, a sample of how TTM processes might be applied in organizations is offered.

Limitations

There are a number of limitations which may lessen the interpretability of these findings. The decisional balance measure contained a more complex factor structure than the two factor structure typically observed in TTM literature. Significant cross loading on multiple scale items across both the factors reflected heterogeneity of the items on the pros and cons scales. Therefore, though the pattern of significant results reflects past TTM findings, the lack of robustness in the pros and cons scales indicates these findings should be viewed as initial support only for the applicability of TTM within an organization environment.

TTM has received extensive attention in its application to behavior change, such as the cessation of smoking and excessive alcohol consumption. Little research focuses on TTM's application within organizations. Therefore, precedent for precise applications of TTM into organizational research is limited, hampering the ability to develop a robust research model. For example, one of the more severe limitations caused by the restricted research base relates to scale construction. Scales used were adapted from past TTM measures, though not from scales specifically for use in an organizational setting or for the particular behavior change in question. This may call into question whether or not the measures used in previous TTM research are measuring the same constructs when applied in an organizational setting. Repetition will bear out whether constructs such as temptation and efficacy maintain their construct validity across

contexts – health related behavior change versus organization behavior change. It could be that constructs like self-efficacy, when applied in an organizational setting, remain consistent or show relationships found with other measures such as organization citizenship.

Of the scales developed for use, the efficacy scales displayed internal consistency and factor structures most congruent with past TTM research. Thus, construction of these scales was successful and should hopefully remain a fairly straightforward process in future research designs of this nature. Unfortunately, the decisional balance scales did not fare as well. The internal consistency measures of the pros and cons scales were only adequate. However, the factor structure displayed by the items was not the typical two factor arrangement.

This may be due to a range of issues. First, an understanding of the employees' perceived advantages and disadvantages of the SBP program may not have been complete. Items included as pros may in fact have been perceived as cons by employees and vice versa. Second, and as an extension of the first point, a particular item may have been perceived differentially by employees, leading some to view a particular item as an advantage while others may have viewed that same item as a disadvantage. Third, the pros and cons of organizational initiatives may prove to display consistently more complex factor structures than typically observed in TTM research. Additionally, these factor structures may vary within a single organization across departments and subunits. TTM research with the most robust findings has focused on health related behaviors. These health related behavior typically possess distinct advantages and disadvantages which are characteristically reinforced by medical

research and social mores. Organization change initiatives may prove to necessitate more complex models in future research.

Another limitation of the present research is the relative lack of generalizability. Researchers conducting preliminary investigations into the applicability of TTM in an organizational context have encouraged examinations of its constructs in various categories of organizations. The present research was conducted within a public, non-profit organization, a distinct type of organization with unique business needs and areas of emphasis. The business models of public versus private companies usually differ, as do those of profit versus non-profit companies. Because of the particular nature of the environment within which the data were collected, the level to which these findings may be generalized to organizations at large may be limited. Such organizational characteristics as strategies emphasized, employee interrelationships and employer-employee interactions often differ qualitatively in public versus private and in profit versus non-profit organizations. This may impact the way in which change is conceptualized and, therefore, reacted to.

Further research in varying types of organizations, conducted across time and across levels of the organization will be necessary before a blanket presumption of TTM's applicability in organizations may be safely rendered.

Another limitation concerns the usability of organization change as a conceptual framework for affecting positive change in business. The current zeitgeist within the public sector may exacerbate the ability to incorporate ideas from TTM into change initiatives. There appears to be a growing cynicism relative to organization change theory and processes as a whole. Vince DiPiazza, a City Manager for Dumas, Texas,

summarizes this current thinking as follows: “Change, as a self-inclusive concept for management education has become so overworked, oversold, and overused that it no longer has any practical value or meaning. That change occurs in organizations and that it often engenders resistance constitutes, as someone once said, a blinding flash of the obvious. Likewise, the techniques offered for so-called ‘managing change’ are, more often than not, trite, warmed-over, and repackaged pronouncements that have not varied in substance for at least 20 years. Let’s declare an indefinite moratorium on articles that discuss any aspect of managing change” (Letters/Anonymous, 2003). If this type of attitude towards change theory is pervasive across both the public and private sector, this might further limit the ability of TTM thoughts to pervade in an applied fashion.

Future Research

Much work is needed in this arena. Psychometric qualities of measures used, precise measurements and understandings of relevant constructs, and longitudinal studies are all areas that require addressing. However, research should continue to focus on the applicability of TTM in an organizational setting. A model of individual behavior change applicable as a guideline for varying intervention efforts, whether changing into a team-based organization or switching providers for water coolers, could provide a potential windfall to businesses and change agents. Such a model would provide a structure for change based upon a theoretical underpinning while still set in the context of everyday business practices. This would enable change agents and organizations to choose the development effort best suited for their individual situation, while possessing a model for how to institute that effort, as it relates to their individual

employees, with maximum efficacy (Prochaska, J. M., 2000). Ultimately, TTM potentially provides a tool facilitating the successful implementation of organization change.

It should also prove advantageous to explore more general types of change initiated across organizational types and in similar patterns (i.e., institution of HRIS systems, alteration of attendance policies, new safety rules). This might allow for the development of decisional balance and efficacy scales functional across research studies in varying organizations. This approach might then lessen the probability of experiencing the type of scale limitations observed in this research. More robust and replicable scales would also enable the amplification of organizational applications of the processes of change. As scales are refined and strengthened, and research findings thereby reinforced, a more complete understanding of the processes, and particular applications of the processes in organizations, could be undertaken. This would mirror the development of TTM research in other domains. For example, much TTM research around smoking cessation has occurred. Scales relevant to this particular behavior change have undergone multiple replications of use. As confidence in the measures has increased over time, this has allowed researchers to focus on subtleties within the research domain and on more applied problems for TTM. A similar pattern could hopefully be achieved for TTM research within organizations. Once measures of core TTM constructs are shown to be psychometrically sound, an enhanced investigation into TTM's processes of change should then occur. Scrutiny into how the processes might be applied, and of their general structure, could enhance the applicability and effectiveness of these processes.

Conclusion

TTM adds to our knowledge of how individuals experience change. Alterations in behavior are influenced by cognitive, behavioral, and perceptual factors. This is important because an application of this knowledge into the greater business world could potentially facilitate the engagement in and successful implementation of business-growing and sustaining change. Initial research is indicative of TTM's potential appropriateness for such applications. However, more research is needed before this statement may be made with a high level of confidence. Further and more generalizable observations should only enhance an organization's ability to facilitate change through an amplified understanding of its employees and application of TTM inspired technologies. As has been seen, there are a number of other frameworks for understanding the mechanisms of organization change and instruments for gathering data relative to these changes. TTM provides a model that collapses many of these other frameworks, providing a more parsimonious tool for engaging in successful organization change.

APPENDIX A
SCALE ITEMS AND MEASURES

1. INFORMED CONSENT

The purpose of this study is to examine the process of developing Tucson Water's Skill-based Pay system and employee reaction to this system. We will gather information by asking for your voluntary completion of this survey. Completing this survey will take approximately 20-25 minutes. Please answer all questions as openly and honestly as possible. All responses will be confidential and viewed by the researcher only. Your individual responses will not be shared with any other individuals. Please do NOT put your name on the survey.

While the information you provide here will potentially be used for future research, the primary intent of this survey is gain an understanding of your thoughts and feelings about the SBP system in Tucson Water. The information you provide will assist The Waters Consulting Group, as we partner with Tucson Water, to develop your SBP system in a way most agreeable to you, the employees.

In case problems or questions arise, I have been told I can contact appropriate individuals at the telephone number 972.481.1950 or via email at TucsonSBP@watersconsulting.com. By voluntarily turning in a completed survey, you are providing informed consent to participate in this study.

2. IRB APPROVAL

RE: Human Subjects Application No. 04-266
Proposal has been approved by the Institutional Review Board and is exempt from further review under 45 CFR 46.101.

Letter received From Sheila Bourns
For: Scott Simpkins, Ph.D.
Chair
Institutional Review Board

3. MEASURES

Decisional Balance

Rating Scale

- 1 = Not Important
- 2 = Slightly Important
- 3 = Moderately Important
- 4 = Very Important
- 5 = Extremely Important

PROS

Please rate HOW IMPORTANT each statement is to your decision to participate (or not participate) in SBP.

<i>Scale Label</i>	<i>Scale Item</i>
Pro1	SBP will provide increased learning opportunities.
Pro2	SBP will enable me to do better work.
Pro3	SBP will make work more enjoyable and pleasant.
Pro4	I will have more control over my level of pay.
Pro5	I will increase my personal level of skills.
Pro6	Opportunities for advancement increase.
Pro7	I will feel more useful and valuable.
Pro8	SBP provides me with the ability to make more decisions myself.

CONS

Please rate HOW IMPORTANT each statement is to your decision to participate (or not participate) in SBP.

<i>Scale Label</i>	<i>Scale Item</i>
Con1	Others will know what skills I do not have.
Con2	SBP will require extra work and effort.
Con3	I am not guaranteed annual merit raises other than Cost of Living raises.
Con4	I will have large amounts of training to complete.
Con5	Even if I have many skills, I will still have to do beginner level jobs.
Con6	Movement through the SBP system is limited by training availability.
Con7	The complexity of my administrative work may increase.
Con8	I will have a higher level of accountability and responsibility.

Efficacy

Rating Scale

- 1 – Not at all
- 2 – Not very
- 3 – A little bit
- 4 – Very
- 5 – Extremely

SELFEFFICACY

How confident are you that you would continue to participate in SBP in each of these situations?

<i>Scale Label</i>	<i>Scale Item</i>
SelfEff1	When my work load increases.
SelfEff2	When my pay does not increase as quickly as I would like.
SelfEff3	When the amount of training I participate in increases.
SelfEff4	When I have to do beginner level jobs.
SelfEff5	When space for training becomes limited.

SelfEff6 When I have to complete more administrative jobs.
SelfEff7 When my level of responsibility increases.

TEMPTATION

How tempted may you be to not participate in the SBP system in each of these situations?

<i>Scale Label</i>	<i>Scale Item</i>
Tempt1	When my work load increases.
Tempt2	When my pay does not increase as quickly as I would like.
Tempt3	When the amount of training I participate in increases.
Tempt4	When I have to do beginner level jobs.
Tempt5	When space for training becomes limited.
Tempt6	When I have to complete more administrative jobs.
Tempt7	When my level of responsibility increases.

APPENDIX B
SAMPLE TTM PROCESSES APPLICATION REPORT

Based on the results of the data collection process, a clearer picture was formed as to exactly what stage of change water department employees stood relative to the SBP system. Applications of the processes of change applicable within the department were developed. It appeared that a majority of the employees were open to the idea of participating in the SBP program, but were undecided as to their participation, as indicated by a majority of employees reporting they were in either the contemplation or preparation stage. This is important to note as the further along in the change stages an individual is, the more likely it is that the change will be successful. Specifically, when implementing an organization change initiative, the more employees there are in the preparation and action stages of change, the more likely the change initiative is to succeed.

The processes of change may be used to facilitate movement from one stage of change into the next. An organizationally applied definition for each process was developed based upon the work of Levesque, Prochaska, and Prochaska (1999). The following list of applied processes is by no means exhaustive and was intended to accomplish two primary goals for the water department. The first goal was provision of initial ideas on steps to facilitate employee movement through the stages of change (and therefore closer to acceptance of and commitment to the change initiative). The second goal was to prompt original thoughts as to how these processes could best be initiated within the water department.

Consciousness raising – Increasing awareness and information about the change or its benefits. Communicating information about the change, its process, benefits and goals.

This enables a better and more informed decision about the change being considered.

Sample application(s):

- Readiness survey assessments and feedback – Readiness survey distribution and collection is one medium for communicating ideas about the change initiative. Survey distribution allows opportunities for introductions to the initiative, descriptions of change expectations through the survey items and survey feedback focused on TTM constructs and applications.
- TTM-focused communication strategy – Communicating change through memos, emails, bulletin boards, etc. Frequent information relevant to the change initiative should be a consistent consideration.

Dramatic relief – Experiencing negative emotions associated with failure to change and relief that comes with success. Generate inspiration for the change and anxiety about the status quo; inspire individuals to participate in the change process.

- ‘Town hall’ sessions – Large group meetings provide a means for delivery of messages and generating emotional responses to change initiatives and discussing those responses in a safe and supportive atmosphere. These meetings may be motivational in nature. Include time for questions, answers, and discussions as to why not initiating the change could have negative consequences. Provide the business case for the change.
- Emotionally compelling materials – Distribute materials provoking emotional responses from employees. This may include personal testimonials, updates on exciting steps being taken in the process (i.e., city council passing the recommended pay structure) or stories of other organizations’ successes with similar efforts.

Environmental reevaluation – Considering how the change will have a positive impact on the social and physical environment. Discussions of reasons for the change – both how the change will alter the environment for the better and how not implementing the change could have led to unfavorable consequences.*

- Feedback sessions – Sessions where employees and supervisory staff meet to discuss ways in which the change initiative is altering work practices and interactions within and between departments. These sessions would allow employees an opportunity to share ideas, concerns and solutions and to analyze improved work processes.

- Support system development – Intentional consideration of and communication about organizational support systems (i.e., communication avenues, technological improvements) as it relates to change initiatives should always occur. Illustration of these new support systems should increase levels of efficacy.

*Note – This process is similar to dramatic relief. In fact, all the processes blend together to some degree. The main differentiation between environmental reevaluation (ER) and dramatic relief (DR) is that ER is focused on the social/physical environment and DR is focused more at the individual level.

Self-reevaluation – Considering how one’s identity, happiness, and success can be enhanced by the change. Developing a sense of how the change initiative can benefit the employees individually

- Communications and feedback sessions – This process would likely overlap with others. Focused communications to and with employees about the individual benefits of the change initiative for the employees.

Self-liberation – The belief that one can help make the change happen and commitment based on that belief. Understanding how participation in the change initiative will benefit the Water department. Helping employees to “see” the big picture and understand how their behaviors and participation fits into this picture.

- “Systems” training – Deliver training to employees on Systems Theory and its application in the Water department. Facilitate employee understanding of how individual actions and skill levels, performed at the individual level, impact the “bottom line” for the Water department as a whole.
- Goal setting and clarification – In conjunction with the Systems training, clarify the “what” of behaviors to be changed. Specify team and individual goals that lead to the achievement of this mission and vision of the Water department. This will help to define each employees’ roles and how their individual behaviors lead to the achievement of goals.

Reinforcement management – Finding intrinsic and extrinsic rewards for new ways of working. For example, compensation systems may provide benefits that outweigh the costs of change, thereby increasing the probability of a change initiative’s success.

- Celebration, recognition and praise – Efforts to recognize exceptional efforts at that individual and team level in relation to the change initiative. Public recognition of achievements or success may be a way to communicate and model new ways of working.
- Performance incentives – Focused incentives providing reinforcement for behaviors that support the change initiative.

Helping relationships – Seeking and using social support to assist with the change.

Providing assistance to employees struggling with the change or deciding whether or not to participate.

- “Troubleshooter” – These individuals work with fellow employees to resolve and adapt problems relative to the change initiative. These individuals work to pro-actively, with the input of fellow employees, resolve change initiative issues.
- Short-term support programs – It may be necessary to provide programs that help employees to handle the stress and anxiety arising from a large-scale change initiative. This may include stress management courses, support groups, and increased opportunities for one-on-one time with supervisors and other leadership personnel.

Counterconditioning – Substituting new, healthy behaviors and cognitions for the old ways of working. Establishing the parameters for effective performance and behavior in the organizational environment following the implementation of the change.

- “New role” orientation – Training for employees and their supervisors on what the organization/department considers to be the ideal picture for employees’ roles following the implementation of the change initiative. The training should provide clear direction for employees while also signaling the organization’s permission for and anticipation of behaviors that may not previously have been viewed as acceptable in the pre-change environment.

Stimulus control – Restructuring the environment to remove signals for non-participation and add signals for participation in the change. Aligning organizational support structures to support, and not inhibit, the change initiative.

- Prioritizing resources – Ensure that compensation and other systems related to the SBP change initiative reflect the importance being placed

upon the initiative and are reinforcing the desired behaviors (i.e., skill attainment, more flexible work habits, etc.).

- Signal management – Continuing communications, including reminders, progress reports and Q & A documents, maintain their importance throughout a change initiative and signal the organization's continuing commitment to the initiative.

Social liberation – The organization empowering individuals to participate in the change, which facilitates the beginning or continuation of change. Establishing new “rules” for employee participation in the change initiative and its maintenance.

- Employee participation – Garnering employee participation in the development and implementation of the change initiative leads to greater levels of employee satisfaction with and commitment to change initiatives.
- Group feedback – Sessions where employees meet to discuss ways in which their roles have been and are changing. These sessions would allow employees an opportunity to share best practices being discovered and to develop, together, solutions for problems encountered.

The processes of change that will be most successful vary as a function of the stage of change the individual is in. Stage matched interventions provide the most positive results in change initiatives. When processes of change are used that are specific to the stage of change an individual is in, the probability of the individual moving into the latter stages of change increases, thereby increasing the likelihood of success in the change initiative.

It was therefore recommended that the Water department implement processes of change in conjunction with their initiative that were “stage matched.” That is, to facilitate employee movement into the latter stages of change, the department should focus on efforts found to be most successful for those individuals in the contemplation and preparation stages, where a majority of their employees considered themselves to be. Recalling the table of processes by stage of change, the first five processes of

change would be most effective in helping a majority of the employees to move through the change process. As full implementation of SBP neared, it was likely that a majority of the employees would have moved into the preparation and action stages. At that time, focus on the latter four processes of change should occur.

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