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# The Development of an Integrated Measure of Readiness for Change Instrument and its Application on ASC/PK

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# THE DEVELOPMENT OF AN INTEGRATED MEASURE OF READINESS FOR CHANGE INSTRUMENT AND ITS APPLICATION ON ASC/PK

THESIS

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Steven W. Clark

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## Abstract

Organizations are continually forced to implement changes due to a myriad of external and internal influences. Despite the fact that organizations are predominantly in a perpetual state of change, recent research has shown that nearly 75% that have initiated large-scale change efforts have not realized the significant organizational improvements that were intended. As a preemptive measure, organizational managers are being encouraged to gauge their organization's readiness prior to implementing change initiatives. Unfortunately, over 40 unique instruments currently exist that purport to measure some aspect of readiness. Because of limited perspective, no one instrument has emerged as the standard and they are often used inappropriately without regard to the psychometric properties involved. The purpose of this study was to analyze the existing instruments available to measure readiness and integrate those that have empirically demonstrated reliability, utility, and validity into a new synergistic instrument that can be utilized across various research disciplines.

The comprehensive instrument was then utilized on the Aeronautical Systems Command's Contracting Directorate, which is currently implementing several Knowledge Management initiatives designed to increase the efficiency and effectiveness of the organization by leveraging the shared knowledge of its members. The results of the study indicate that members of ASC/PK have a generally positive attitude toward Knowledge Management initiatives. In addition, the comprehensive change model being tested fit the data.

# THE DEVELOPMENT OF AN INTEGRATED MEASURE OF READINESS FOR CHANGE INSTRUMENT AND ITS APPLICATION ON ASC/PK

## I. Introduction

### *Background*

Organizations are continually forced to make changes to nearly every aspect of their operations due to a growing global economy, political pressure, social stress, technological advances, and a vast array of other internal and external influences. Managers at all levels, whether it is in a public or private business environment, have found that the only thing that will remain constant is change. Regardless of whether the change will have an impact at the individual or organizational level, it is human nature to resist the change from what is familiar to the unknown and the effects of this phenomenon grow exponentially as the proposed change goes beyond superficial organizational changes and imposes risk and uncertainty onto deep-rooted cultural aspects of the organization. Remarkably, despite the perpetual state of change in organizations, research has shown that three out of every four organizations that have initiated large-scale change efforts have not realized the significant organizational improvements that were intended, often at a tremendous price (Choi & Behling, 1997).

In an attempt to better understand the change process, academic researchers and practitioners from various disciplines have attempted to classify different stages of change whether it involves health and human services, educational systems, psychology, or general business environments. "Understanding the dynamics of the change process and the factors that influence it, both positively and negatively, may facilitate the

diffusion process" (Moore, 1993). Perhaps the most simplistic interpretation is a three stage process introduced by Lewin (1947) who described the change process as a force field model that involves three steps: (a) Unfreezing; (b) Changing; and (c) Refreezing.

Although this original view of change seems elementary, there are countless other people who have studied change and developed their own stages, indicators and factors that contribute to the acceptance/resistance to change. For instance, the Transtheoretical Model (TTM) offers an example of a more modern interpretation of the change process (Prochaska & DiClemente, 1982). The TTM uses a five-stage construct to represent the transient, motivational and constancy aspects of change and prescribes a different intervention strategy for each stage. The five stages are, (a) *precontemplation* (an individual is not intending to make changes), (b) *contemplation* (an individual is considering a change), (c) *preparation* (an individual is making small changes), (d) *action* (an individual is actively engaging in a new behavior), and (e) *maintenance* (an individual is sustaining the change over time). While more contemporary views add granularity to the change process by identifying additional factors and offering more detailed stages of change, the process of implementing change generally distills into three intertwining stages: (a) *readiness*, when the organizational environment, structure, and member's attitudes are receptive to a proposed change; (b) *adoption*, the members of the organization temporarily alter their attitudes and behaviors to conform with the expectations of the change; and (c) *institutionalization*, when the change becomes a established element of the employee's permanent behavior (Holt, 2000).

Based on the dismal success rates of change implementation, managers are being encouraged to be proactive by utilizing change measurement instruments to gauge their

organization's demeanor before implementing changes (e.g., Jansen, 2000; Simon, 1996). Largely, the results have been poor due to the fact that few organizations actually assess readiness for change prior to implementing changes. One of several factors that experts have contributed to these less than desirable outcomes has been the organizational members' initial readiness for the changes which is the initiating stage of change. It is a primary postulate of this research that those organizations that are able to gauge readiness before implementing changes will be able to develop focused readiness development programs and positively influence more successful change initiatives.

A significant impediment toward managerial efforts to gauge readiness for change is the vast number of change instruments that are readily available. In reviewing the academic literature for this paper, over 40 different measurement instruments were found to exist that claim to measure some aspect of readiness. Primarily, these instruments tend to be very specific toward one discipline, for instance physicians or educators. Because of limited perspective, no one instrument has emerged as a standard and instruments are often used inappropriately without regard to the psychometric properties involved (Holt, 2000). The purpose of this research was to analyze the existing instruments available to measure readiness for change and integrate those that have empirically demonstrated reliability, utility, and validity into a new synergistic instrument that can be utilized across various research disciplines. It is anticipated that the development of a more comprehensive change measurement instrument will facilitate future research concerning readiness and foster a better understanding of the complicated dynamics of organizational change.

Specifically, this new change instrument was designed to comprehensively measure four main research perspectives dealing with organizational change. The first perspective was the *process* of the change, or "how" leadership will encourage change in an organization. The second perspective measured was the *context* of the change, which examines "why" the change is needed. A third perspective of interest was the *content* of the change with regard to the nature of the change and "what" exactly is involved. Finally, because of the critical role that the individuals within an organization have on the success or failure of organizational change, the *individual* perspective, or the "who" of the change, was of interest. In the research analysis, each perspective is broken down into smaller elements to ascertain the specific variables necessary to accurately measure each perspective.

Beyond the veil of confusion imposed on organizational managers by the sheer number and variety of instruments available to measure readiness, two other details must be addressed as well. First, the research surrounding each instrument has its own interpretation of what readiness is and what is required to measure it. Second, when searching for an appropriate change instrument, how is an organizational manager supposed to make meaningful comparisons among the existing instruments?

### *Definition of Readiness*

Another complicating factor that hinders managerial efforts to measure readiness prior to initiating a change effort is the lack of a standardized definition of readiness. The general definitions supplied in the existing literature use the word "readiness" as a necessary precondition for a person or an organization to succeed in facing organizational change (Holt, 2000). Similar to the need to properly identify a problem before attempting

to solve it, it is necessary to properly define readiness before the concept can be accurately measured. To formally standardize the definition of readiness, Holt (2000) synthesized the existing definitions as they relate to both individuals and organizations in a way that captures the general essence of the term and supplied the following definition of readiness used for the remainder of this research:

> "*Readiness for change* is a comprehensive attitude that is influenced simultaneously by the content (i.e., what is being changed), the process (i.e., how the change is being implemented), the context (i.e., circumstances under which the change is occurring), and the individuals (i.e., characteristics of those being asked to change) involved and collectively reflects the extent to which an individual or a collection of individuals is cognitively and emotionally inclined to accept, embrace, and adopt, a particular plan to purposefully alter the status quo" (p. 32).

This definition connotes that readiness is a paradigm that needs to be assessed at the individual level. According to Holt (2000), the analysis of readiness at the individual level seems particularly appropriate for two primary reasons. The first reason is based on the basic principle that it is virtually impossible for a single person within an organization to possess perfect information concerning ongoing activities. This idea is most exemplified when considering the various perceptions members at different levels of the organization would develop concerning the overall environment amidst organizational change. To further illustrate this principle, research conducted by Sackmann (1992) found that the attitudes regarding the work and the environment varied across organizational subunits and among the individuals within particular subunits.

Second, the fundamental characteristics of organizational change lend itself to assessing readiness at an individual level. Generally, organizational changes, when initiated, must be implemented through altering the actions and work of the organizational members—a commonly expressed thought in current change literature (e.g., Eby, Adams, Russell, & Gaby, 2000; George & Jones, 2001; Judge et al., 1999). Given this reality, it seems appropriate to gauge readiness by assessing the attitudes of those same people who must actually change their behavior in order to implement the change.

### *Review of Existing Instruments*

Given the importance that has been placed on preemptively measuring readiness as a distinct construct of change, it was not surprising that a comprehensive search of the change literature produced over 40 "unique" instruments. Because these instruments covered a broad spectrum of topics, they were located in a wide assortment of academic journals, business magazines, and practitioner publications. In order to summarily compare and contrast the psychometric properties of such a large number of diverse instruments, a systematical method was needed. One such method in which constructs are conceptualized and measured is multifaceted classification or "facet analysis." It was first suggested by McGrath (1968) as a useful method to integrate and compare research information concerning a specific topic.

Applying this analytical strategy, a *facet* is a relevant conceptual dimension or property that underlies a group of objects and should be relevant to all of the objects in a given set (McGrath, 1968). The *elements* of a facet are the different values or the points that describe the variation on that particular dimension or property (McGrath, 1968), in

this case, readiness. Thus, making it possible to systemically examine relevant aspects of a group of interest and describe it. For example, in systematically analyzing a group of human beings, one relevant facet might be gender, where the elements that describe this facet would be (a) male and (b) female.

*Facets of Analysis*

The instruments designed to measure readiness can be compared and contrasted along a number of particular facets that highlight their similarities and differences. First, the instruments were compared based on their content and the implicit assumptions that this content makes about the definition of readiness. Moreover, given that this discussion focuses on the various *instruments* used to measure readiness and the legitimacy of any measurement instrument is embedded in the instrument's psychometric properties (Schriesheim, Powers, Scandura, Gardiner, & Lankau, 1993), several facets summarize the evidence that has been collected regarding to the instruments' psychometric properties. Consistent with the literature on psychometric theory, the following nine facets identified by Holt (2000) were used to contrast and compare the existing literature on readiness for change:

> *Perspective of the instrument.* Identifies the perspective used by the developer of the instrument to assess readiness for change (i.e. change process perspective, individual perspective, etc.).
>
> *Underlying premise or assumption.* The assumptions and definitions regarding the readiness for change concept that could be inferred from an instrument that assessed readiness from a given perspective.

*Research discipline.* The academic area of research or discipline where an instrument was most commonly observed (i.e. education, medicine, etc.).

*Item development.* The approach used to develop an instrument's items.

*Content validity.* The types of content validity evidence that have been reported in the literature regarding an instrument (i.e. reviewed by expert judges, etc.).

*Predictive validity.* The types of predictive validity evidence that have been reported in the literature regarding the instruments (i.e. postdictive, concurrent, etc.).

*Construct validity.* The types of construct validity evidence that have been reported in the literature regarding the instruments (i.e. exploratory factor analysis, confirmatory factor analysis, etc.).

*Reliability estimates.* The types of reliability estimates that have been reported in the literature regarding the instruments (i.e. coefficient alphas, etc.).

*Scales.* The latent constructs that an instrument claims to assess (i.e. precontemplation, management practices, etc.).

Utilization of facet analysis provided the researcher a methodology of organizing the various change instruments into major categories of change themes and accompanying sub-categories of change variables identified as essential in measuring an organization's readiness for change. The most applicable and validated items from existing instruments were then used to create the comprehensive change instrument used in this research. The following sections are a breakdown of the change themes and sub-categories of variables that were used including the source of the items, the number of

items, an example of the items, and a discussion of the statistical estimates of reliability pertaining to the items used.

In summary, the substance of the instruments available to gauge readiness indicate that the content of the change, the process employed to implement change, the organizational context, and the characteristics of the individuals who make up the change target may influence the readiness of an organization. Several instruments were excluded from this review because they failed to measure readiness as a change adoption, could not be used in an organizational setting, or used open-ended items. To facilitate the discussion of the 30 instruments retained for this research, they are categorically reviewed and analyzed in the following sections according to which perspective they most appropriately fit.

*Change Content Instruments*

By suggesting that readiness is reflected in attitudes about the type of change being implemented, the analysis focused on the three change content instruments contained in Table 1. Stemming from the education literature and based on Hennigar's (1979) Receptivity to Change Inventory (RCI), Loup (1994) developed the Modified Receptivity to Change Inventory (MRCI). Mirroring various other instruments utilized in education environments (cf. Chauvin & Ellett, 1993a; Crisafulli, 1982; Hennigar, 1979), the MRCI was developed to determine if teachers and administrators would be receptive to a proposed change. From the responses, it became readily apparent that the respondent's level of receptivity hinged primarily on to what degree the change would threaten their current level of autonomy or authority. Analytical evidence suggested

Table 1

*Review of Existing Readiness Instruments*

| Perspective/Instruments | Content | Process | Context | Individual |
|---|---|---|---|---|
| **Content** | | | | |
| Loup (1994) | ☑ | | | |
| Velicer, et al. (1985) | ☑ | | | |
| Kazlow (1977) | ☑ | | | |
| **Process** | | | | |
| Harvey (1990) | ☑ | ☑ | ☑ | |
| Human Resource Development Press (1995) | | ☑ | ☑ | ☑ |
| Hanpachern (1997) | | ☑ | | |
| **Context** | | | | |
| Burke, et al., (1996) | | ☑ | ☑ | |
| Deevy (1995) | | | ☑ | ☑ |
| Henkel et al., (1993) | | | ☑ | |
| Bollar (1996) | | | ☑ | |
| Jones & Bearley (1996) | | | ☑ | ☑ |
| Siegel & Kaemmerer (1978) | | ☑ | ☑ | ☑ |
| Keith (1986) | | ☑ | ☑ | |
| Hay & McBer Company (1993) | | ☑ | ☑ | |
| Ireh (1995) | | | ☑ | |
| Eby (2000) | | | ☑ | |
| Zmud (1984) | | | ☑ | |
| **Individual-Attitudinal State** | | | | |
| McConnaughy et al. (1983) | | | | ☑ |
| Moore (1993) | | | | ☑ |
| Herscovitch & Meyer (2002) | | | | ☑ |
| Bedell et al. (1985) | ☑ | ☑ | ☑ | ☑ |
| Waugh & Godfrey (1995) | ☑ | ☑ | | |
| Willey (1991) | | ☑ | ☑ | ☑ |
| **Individual-Psychological Trait** | | | | |
| Trumbo (1961) | | | | ☑ |
| Hurt, et al. (1977) | | | | ☑ |
| Johnson & Kerckhoff (1964) | | | | ☑ |
| Al-Khalaf (1994) | | | | ☑ |
| Neal (1965) | | | | ☑ |
| Kaluzney et al. (1974) | | | | ☑ |
| **Individual-Ability Focused** | | | | |
| Metropolitan Reading Test (Nurss, 1979)[a] | | | | |

[a]There are a number of instruments designed to measure readiness to read (see a review by Nurss, 1979). However, these instruments are not included because they are not related to organizational readiness; instead, the Metropolitan Reading Test is included to provide an example of an instrument where specific cognitive capabilities are measured as an indicator of readiness.

that individuals are more receptive to a change they perceive to be superficial when compared to a change they feel challenges their deep-rooted culture.

Because the primary focus of this research was to develop a comprehensive change measurement instrument that can be applied across various organizational settings, a couple of factors limit the applicability of the MRCI and several modified versions (e.g., Chauvin et al., 1993a; Clarke et al., 1996; Crisafulli, 1982; Hennigar, 1979; Loup, 1994). To begin with, the instrument restricts its widespread use by utilizing items that specifically address initiatives found in school settings. In addition, the instrument can only be used at certain times, even within a school setting, because the items reference specific innovations that may not be present in every situation (e.g., instituting a breakfast program for students).

In a similar manner, the Decisional Balance Inventory is another change content instrument that is designed for a particular setting. Developed by Velicer, DiClemente, Prochaska, and Brandenburg (1985), this instrument assesses an individual's readiness for making changes to one's diet, in the context of the pros and cons of dieting, by gauging their perceptions of these changes. Their implication is that an individual who is ready for change will report more pros and fewer cons. While Velicer et al. (1985) and O'Connell and Velicer (1988) present considerable evidence concerning the instrument's reliability and construct validity, its use would appear on the surface to be just as confined as the MRCI. However, the content is slightly more general suggesting the potential use in an organizational setting. For instance, one item that asks, "I would be able to accomplish more if I carried fewer pounds" could be transformed to read, "I would be able to accomplish more if we made this change."

Based on earlier work by Giacquinta (1975), another content instrument focusing on school systems is the change continuance instrument published by Kazlow (1977). Making use of semantic differential scales, participants are asked to describe their feelings regarding a specific change through the use of bi-polar adjectives (e.g., "progressive" or "regressive"). When organization members respond in a more positive manner (e.g., changes viewed to be good, progressive, wise, effective, valuable, or positive), conditions are more favorable for change within an organization. Although no validity or reliability information was provided by Giacquinta (1975) or Kazlow (1977) regarding their use of these instruments to measure readiness, semantic differential scale methods have been reliably used in a myriad of research settings. Kazlow does make reference to validity and reliability estimates in research conducted by Osgood, Suci, and Tannenbaum (1957) and Nunnally (1967).

Pearson (1977) conducted an extensive review of numerous studies concerning the use, validity, and reliability of semantic differential scales. Pearson's research concluded that there was overwhelming support for this methodology as a reliable, valid, and robust technique for measuring a member's satisfaction as a multi-dimensional, attitudinal construct. This provides a valuable tool for managers to extract responses that convey information about an individual's feelings toward a measurement concept on the basis of what that concept means connotatively to that individual (i.e. readiness).

Collectively, these content instruments provide a respectable level of optimism regarding their value to managers wanting to determine how respondents feel about a possible organizational change. Primarily focusing on the individual's perception regarding the "pros" and "cons" of the proposed change (e.g., Velicer et al., 1985;

Giacquinta, 1975; Kazlow, 1977), the literature suggests that individuals will be more receptive to changes that are more consistent with their existing culture than those that are dramatic departures from the culture (Loup, 1994). The facet analysis of these instruments revealed that while the MRCI and Decisional Balance Inventory both reported construct validity and reliability estimates, neither instrument demonstrated content or predictive validity. Although Kazlow's (1977) research only reported construct validity, peripheral research (i.e. Pearson, 1977) substantiates the use of semantic differential scales in a wide variety of settings. The widespread use of Loup's MRCI is primarily restricted by its specific relationship toward educational settings while Velicer's instrument appears more conducive to converting items related to dieting to measure readiness in general. Bolstered by the psychometric properties reported in Pearson's research, the use of semantic differential scales is very promising.

Based on this review and bolstered by the psychometric properties reported in Pearson's research, the decision was made to only use Kazlow's semantic differential scales. Due to the restrictive nature of the other two instruments, the research turned to other measures containing content variables that had a more demonstrated track record. Variables designed to measure a person's perception of how appropriate the change is and another set of variables that measure a person's apprehension toward the proposed change were used to augment the content perspective. Table 2 shows the facet analysis of the content variables used in this research.

Table 2

*Facet Analysis of the Change Content Variables*

| | *Appropriateness* | *Personal Valence* | *Semantic Differential Scales* |
|---|---|---|---|
| 1. Source of the instrument | Holt (2002) | Holt (2002) | Kazlow (1977) |
| 2. Research discipline. | Organization Sciences | Organization Sciences | Education |
| 3. Item development. | Inductive | Inductive | Deductive approach |
| 4. Content validity. | Review by expert judges<br>Q-factor Analysis from independent judges<br>Proportions of substantive validity | Review by expert judges<br>Q-factor Analysis from independent judges<br>Proportions of substantive validity | Unclear |
| 5. Predictive validity. | Predictive | Predictive | No evidence of predictive validity |
| 6. Construct validity. | EFA<br>CFA<br>Convergent Validity | EFA<br>CFA<br>Convergent Validity | EFA (inconsistent factor structure) |
| 7. Reliability estimates. | Coefficient alpha | Coefficient alpha | No evidence of predictive validity |
| 8. Scales. | Appropriateness. "I think the organization will benefit from this change." (10 items; a = .94) | Personal valence. "My future in this job will be limited because of this change." (3 items; a = .66) | Rate attitudes toward the introduction of a specific change initiative using adjective pairs (e.g., introducing sex education in the schools or reorganization of the school).<br>Evaluation. "Ineffective—effective." (6 adjective pairs) |
| 9. Key citations | -- | -- | -- |

*Note.* EFA = Exploratory factor analysis.

*Change Process Instruments*

By primarily focusing on "how" the proposed change will be implemented, there are three instruments contained in Table 1 that were classified as process instruments. The Checklist for Change is an instrument developed by Harvey (1990) that assesses five dimensions of change. Harvey labels the dimensions as (a) planning for implementation, (b) organizational context, (c) potential for motivation, (d) understanding the change, and (d) dealing with resistance. The only dimension that was not determined to measure a process aspect of organizational change was the organizational context dimension.

The ChangeAbilitator (Human Resource Development Press, 1995) is a similar process instrument that taps into respondent concerns regarding the adequacy of the information they have received about the change. The *information* dimension of the ChangeAbilitator determines how much a respondent is aware of the resources that will be made available if the proposed change is adopted. Additionally, the *transforming* dimension provides the respondent an avenue to express their opinions about modifying the change or how it is used after the change has been implemented. Obviously if an individual's responses to these items are primarily negative, the information transfer processes used by the change agent to keep the members informed of the change are most likely inadequate.

The third instrument classified as a change process instrument, a resisting-promoting-participating instrument, was developed by Hanpachern (1997). Taking a slightly different approach, Hanpachern evaluates the processes used by the leaders of an organization by measuring the respondent's perceptions and opinions of the proposed change. The theory behind this instrument is that it is possible to use an employee's

willingness to promote and participate in a change to evaluate the processes leaders are using to communicate the change to employees. The basic nature of an individual's responses to these items will indicate that employees are either willing or unwilling to promote and participate in the change.

The facet analysis of these instruments creates a challenging situation concerning their use by both academic researchers and managerial change agents. First, the analysis reveals considerable weaknesses regarding the psychometric properties of these instruments. The weakest of the group appears to be the Resisting-promoting-participating instrument developed by Hanapachern (1997). While it did report a coefficient alpha estimate of reliability, there was no evidence of content, predictive, or construct validity. In addition, no other studies were identified to support the use of the instrument. Both the Checklist for change (Harvey, 1990) and the ChangeAbilitator (Human Resource Development Press, 1995) were reviewed by expert judge to provide evidence of their content validity. In addition, the ChangeAbilitator's construct validity and reliability was judged adequate in one follow-up study (Hall, George, & Rutherford, 1998) but showed no evidence of predictive validity. Finally, Harvey's Checklist for change did not report any predictive validity, and although it did report construct validity through the use of exploratory factor analysis (EFA), the factor structure could not be replicated in three other studies (cf. England, 1990; Mahler, 1996; Test, 1991).

Second, despite their reliability and validity shortfalls, these instruments sufficiently illuminate the importance of the change process itself in creating readiness and can effectively assess strategies being employed to create readiness. These particular instruments highlight the importance members place on the presence or absence of

leadership support and the effect it will have on their acceptance or rejection of various organizational changes. In addition, the member's perception concerning the organization's communication climate, specifically the perceived quality of the information they are receiving regarding changes, is significant. Therefore, the challenge lies in finding or developing appropriate instruments to tap into these process variables.

It is readily apparent that there are several process steps available to organizational leaders with communication and participation being the two most common. Communication refers to the methods that leadership can use to share information and is said to reduce uncertainty. Participation is the act of leadership involving members in the planning and implementation of change. Unfortunately, the instruments contained in this review failed to tap into these process steps and the research had to search for other proven process variables. Table 3 shows the facet analysis of the process variables used in this research.

*Change Context Instruments*

In all, eleven instruments, each originating from the organizational sciences discipline, were classified as contextual measurement instruments (see Table 1). These instruments are designed to measure readiness by focusing on organizational conditions that influence a member's perceptions of "why" a change is needed, such as, interpersonal relationships, organizational norms, values, rules, and regulations. Because they internally focused on characteristics of the organization where change is actually occurring, it is obvious that these practitioners feel a respondent's readiness to accept organizational change is directly tied to their perceptions of their internal environment.

Table 3

*Facet Analysis of the Change Process Variables*

| | *Management Support* | *Participation* | *Communication Climate* | *Quality of Information* |
|---|---|---|---|---|
| 1. Source of the instrument | Holt (2002) | Wanberg & Banas (2000) | Miller et al. (1994) | Miller et al. (1994) |
| 2. Research discipline. | Organization Sciences | Organization Sciences | Organization Sciences | Organization Sciences |
| 3. Item development. | Inductive | Deductive | Deductive | Deductive |
| 4. Content validity. | Review by expert judges<br>Q-factor Analysis from independent judges<br>Proportions of substantive validity | Reviewed by expert judges | Reviewed by expert judges | Reviewed by expert judges |
| 5. Predictive validity. | Predictive | No evidence of predictive validity | No evidence of predictive validity | No evidence of predictive validity |
| 6. Construct validity. | EFA<br>CFA<br>Convergent Validity | EFA<br>Convergent | EFA<br>Convergent | EFA<br>Convergent |
| 7. Reliability estimates. | Coefficient alpha | Coefficient alpha | Coefficient alpha | Coefficient alpha |
| 8. Scales. | Management support. "Our senior leaders have encouraged all of us to embrace this change." (6 items; a = .87) | Participation. "I have been able to participate in the implementation of the changes that have been proposed and that are occurring." (4 items; a = .72) | Communication climate. "I feel like no one ever tells me anything about what's going on around here." (4 items; a = .79) | Quality of information. "The information I have received about the change has been timely." (6 items; a = .86) |
| 9. Key citations | -- | -- | -- | -- |

*Note. EFA = Exploratory factor analysis.*

As expected with such a large number of instruments purportedly measuring the same aspect of readiness, these instruments provide a considerable amount redundancy in their utility. The task climate, the relationship climate, and the overall change climate are the three primary facets of the internal context that are measured by these instruments (Holt, 2000). If the organization has established the proper task environment, employees will be more receptive to a proposed change. Specifically, this relies on the formal control and coordination infrastructure that will guide the organization throughout the change implementation. Respondents generally expressed more optimism toward an impending change if they perceived the change as being compatible with the organization's core competencies. This takes into consideration both the internal and external operating environment. For example, the Lay of the Land Survey (Burke, Coruzzi, & Church, 1996) suggests that readiness can be measured by tapping into the employee's perception of how well the change will internally complement their *job/skills/knowledge*. In a similar manner, the RapidResponse Readiness Checklist (Deevy, 1995) measured readiness by soliciting respondent's perceptions of how well the proposed change would complement the company's goals with a construct labeled as a *position in the marketplace*.

Another area of emphasis for these instruments was the relationship context. For the purpose of this literature review, the relationship context is defined as the patterns and processes of interaction among organizational sections and members. In general, the dimensions of the relationship context have suggested readiness is reflected in the way (a) information is exchanged (cf. Deevy, 1995; Henkel, Repp-Begin, & Vogt, 1993; Jones & Bearley, 1996), (b) decisions are made (cf. Hay and McBer Company, 1993;

Henkel et al., 1993), and (c) management behaves (cf. Hay and McBer Company, 1993; Henkel et al., 1993). For example, Henkel et al. (1993) utilized several dimensions in their Empowerment-Readiness Survey, namely, *communication*, *value of people*, and *concepts of power*, to assess each of these ideas.

Finally, the organization's overall change climate makes reference to the organization's general predisposition to embrace or accept change. This area of research has led researchers to construct scales alleging to measure a person's belief that the organization is generally inclined to be innovative and change-oriented without regard to any specific change initiative (i.e. Bollar, 1996). Most likely, an organization that is generally innovative and open to change will react more favorably to any change regardless of the change's content or process used to implement it.

With so many instruments in this realm to choose from, it is important to carefully review their psychometric properties. Five of the instruments reported content validity (review by expert judges) to include: (a) Lay of the Land Survey (Burke et al., 1996), (b) Empowerment-Readiness Survey (Henkel et al., 1993), (c) Vision Progress Survey (Bollar, 1996), (d) Organizational Readiness Scale (Jones et al., 1996), and (e) the Siegel Scale for Support for Innovation (SSSI; Siegel, 1978). Of the eleven, only Burke et al.'s Lay of the Land Survey reported predictive validity. Construct validity, as determined with exploratory factor analysis, was reported for three instruments, namely, Burke et al.'s (1996) Lay of the Land, Keith's (1986) Management Self-Improvement Survey of Readiness, and the Siegel and Kaemmerer's (1978) SSSI. Eight of the eleven instruments reviewed reported estimates of reliability. Finally, the Lay of the Land

Survey was the only instrument with additional research studies conducted to corroborate the psychometric properties of the instrument (Anderson-Rudolf, 1996; Fox, 1990).

Based on this analysis, Holt (2000) suggest that researchers and practitioners should exercise some caution as they make a decision to use these instruments in a field setting. However, they further suggest that the convergence of the instruments' content offers a level of clarity to the overall concept of readiness. Collectively, the instruments' content suggests that readiness is exhibited in specific characteristics of the organization. For instance, the organization's task climate is important for a number of reasons. In particular, the literature clearly indicates the idea that the proposed change should be a logical step toward the stated goals of the organization. Additionally, aspects of the relationship climate appear important. Positive interactions between members of the organization at all levels will tend to promote readiness. This can also have a reciprocal effect toward the change process variables by establishing the right environment to enhance the strategies of communication. Investigators need to explore the extent to which opinion leaders or an individual's co-workers support change as readiness is assessed, analogous to the leadership support idea suggested by the process instruments. Ultimately, because of the web of uncertainty surrounding the psychometric properties of these eleven instruments, the decision was made to look for variables beyond the contextual instruments contained in this review. Table 4 shows the facet analysis of the context variables used in this research.

*Individual Instruments*

Another prominent perspective identified in the existing readiness literature was a function of individuals' personal characteristics. In all, thirteen instruments fit into this

Table 4

*Facet Analysis of the Change Context Variables*

| | *Perceived Organizational Support* | *Discrepancy* | *Principal Support* |
|---|---|---|---|
| 1. Source of the instrument | Eisenberger et al. (1986) | Self & Armenakis (2002) | Self & Armenakis (2002) |
| 2. Research discipline. | Organization Sciences | Organization Sciences | Organization Sciences |
| 3. Item development. | Deductive | Deductive | Deductive |
| 4. Content validity. | Review by expert judges | Review by expert judges | Review by expert judges |
| 5. Predictive validity. | Predictive | No evidence of predictive validity | No evidence of predictive validity |
| 6. Construct validity. | EFA<br>Convergent | No evidence of construct validity | No evidence of construct validity |
| 7. Reliability estimates. | Coefficient alpha | No evidence of reliability | No evidence of reliability |
| 8. Scales. | Perceived organizational support. "The organization really cares about my well-being." (6 items—reduced from original 36-item scale) | Discrepancy. "Our organization has problems that need to be addressed." (3 items) | Principal support. "My peers have supported this change effort." (2 items) |
| 9. Key citations | -- | -- | -- |

*Note. EFA = Exploratory factor analysis.*

category. Due to their varying psychometric properties, the instruments are broken up into three different divisions represented in Table 1. Six of the instruments are considered attitudinal state instruments, another six are classified as psychological trait instruments and the last one is an example of an ability-focused instrument.

*Attitudinal state instruments*. These instruments are designed to measure readiness by evaluating the attitudinal state of individuals. Utilizing Lewin's (1947) three change stages—unfreezing, moving, and refreezing—McConnaughy, Prochaska, and Velicer's (1983) University of Rhode Island Change Assessment (URICA) and the Denial-Resistance-Exploration-Commitment instrument created by Moore (1993) are two similar instruments based on the proposition that a person's readiness can be represented by their state within the change process. For instance, McConnaughy et al.'s (1983) URICA instrument is derived from Prochaska and DiClemente's (1982) transtheoretical model (TTM) of behavior change, also known as Stages of Change Model. As mentioned earlier, the TTM conceptualizes five ordered stages of change as *pre-contemplation* (a person is not intending to make changes), *contemplation* (a person is considering changes), *preparation* (indicating a person is ready to take action very soon), *action* (a person is engaging in new behaviors), and *maintenance* (a person is sustaining changes over time). McConnaughy et al. (1983) used this stage model as the impetus for developing their readiness instrument. McConnaughy and her colleagues suggested that clients enrolled in psychotherapy were pre-contemplators and would not benefit from the therapy if they believed they did not have a problem and were not prepared to discuss relevant issues with the therapist. On the other hand, contemplators were those individuals who have acknowledged they have a problem and were considering changes.

These individuals appeared ready to undergo therapy and probably could benefit from the assistance offered by a therapist.

The psychometric properties of McConnaughy et al.'s (1983) URICA instrument reveal that the instrument is sound. To establish predictive validity, URICA was used in a clinical setting to accurately predict the attendance and actual weight loss of participants in a weight control program (Prochaska, Norcross, Fowler, Follick, & Abrams, 1992). Content validity was established by three graduate students who systematically reviewed the original pool of items. Although the three students might not be considered "expert judges", they were familiar with the transtheoretical model of change. Additionally, construct validity has been established by data that confirm that individuals move through the stages of the change process in the order suggested. However, this may occur in a cyclical pattern as individuals relapse, moving through the certain stages repeatedly (McConnaughy, DiClemente, Prochaska, & Velicer, 1989). Also, the original five-stage structure has been supported by data using both exploratory (DiClemente & Hughes, 1990; McConnaughy et al., 1989; McConnaughy et al., 1983) and confirmatory (Rossi, Rossi, Velicer, & Prochaska, 1995) factor analytic methods.

Despite a preliminary record as a valid and reliable instrument, there appeared to be only two studies that have attempted to measure readiness using the URICA instrument in an organizational setting (e.g., Harris & Cole, 1999; Main, Cohen, & DiClemente, 1995). Similar results of the medical research were obtained by Harris and Cole (1999) when they applied a modified version of the URICA instrument on employees of a large manufacturing firm embarking on a new leadership development program. Their study provided preliminary evidence that a modified URICA instrument

can reliably assess and offer insight concerning attitudes relating to motivation to learn and general satisfaction with development experiences in a leadership development context.

Based on the original work of Jaffe, Scott, and Tobe (1994), Moore (1993) offered another instrument intended to assess readiness by examining the respondent's stage of change. Jaffe and his colleagues, working in the organizational sciences, proposed a four-stage model consisting of (a) denial; (b) resistance; (c) exploration; and (d) commitment. Moore (1993) operationalized these stages with multi-item scales. However, Moore did not report any psychometric evidence and no additional research studies were found utilizing the instrument.

The other five instruments designed to examine the stages of a change are more specifically related to a respondent's readiness as it pertains to a specific organizational change effort, but still from the perspective of the individual. The Commitment to Change Instrument (CCI) is a relatively new instrument developed by Herscovitch and Meyer (2002). The CCI is an adaptation of a highly regarded organizational commitment scale developed by Allen and Meyer (1990). The CCI assesses individuals' commitment to change in terms of *continuance commitment to the change* (i.e., a desire to go along with the change), *normative commitment to the change* (i.e. perceiving the cost of failing to go along with the change), and *affective commitment to the change* (i.e., feeling obligated to support the change). The CCI reported both construct validity and internal consistency reliability.

Based on Davis' (1973) A-VICTORY model, another attitudinal-state instrument was developed by Bedell, Ward, Archer, and Stokes (1985). The foundation of Davis'

model is built on the suggestion that readiness can be measured using eight specific attitudes. The attitudes identified by Davis were: (a) ability, the resources and capabilities necessary to implement and sustain change; (b) values, the consistency of change with the existing beliefs and philosophy of the organization; (c) information, the accuracy of the information related to implementing the change; (d) circumstances, the relevant features of the organization's environment that influence adoption; (e) timing, the particular combination of events that may help or hinder change; (f) obligation, the belief that there is a need to change from the present way of operating; (g) resistance, inclinations to inhibit the change; and (h) yield, the perceived rewards or payoff for changing. Davis contended that favorable attitudes in these eight areas would indicate an employee's readiness to change.

In their study, Bedell et al. (1985) carefully established an initial level of content validity by having two independent raters review the items and administering the instrument to two independent samples. Thus, they were able to provide estimates of the internal consistency, refine the items, and explore the factor structure. Regarding the instrument's predictive validity, Bedell et al. discovered that employees who reported that the changes were commonly accepted felt the changes were consistent with (a) existing beliefs (i.e., value), (b) needs (i.e., obligation), (c) benefits (i.e., yield) and that participants appeared to be more informed about requirements to implement the change (i.e., information). Regrettably, there was little evidence regarding the measures' predictive or construct validity beyond the original study (cf. Kiresuk, Lund, Schultz, & Larsen, 1977; McKenna, 1993; Studer, 1978).

While the psychometric shortcomings of the Bedell et al. instrument cannot be overlooked, because Davis (1973) used an extensive research program to develop his A-VICTORY instrument while he was an administrator at the National Institute of Mental Health, the utility of Bedell et al.'s instrument appears somewhat promising. More importantly, the instrument appeared to provide organizational leaders with information that they could actually use to enhance a readiness framework by setting up a plan of action to effectively intervene in the change process and facilitate a favorable transition. For instance, a low score in the obligation attitude, which reflects the employee's belief that there is a need to change from the present way of operating, can help managers construct effective messages to accurately express the need for the change.

The final two attitudinal-state instruments are the Unit Curriculum Receptivity Scale (Waugh & Godfrey, 1995), and the Faculty Readiness Scale (Willey, 1991). While the content of these two instruments significantly overlaps the aforementioned state instruments, the results of their use would be unpredictable without further examination. In the facet analysis, neither instrument reported any psychometric properties.

According to Holt (2000), there are several advantages to using to using instruments classified as individual state instruments. The first is that it is often helpful to think of readiness in terms of various states that can be modified by systematic and concerted actions (i.e. the process). Another advantage is that change agents will be able to enhance readiness by developing a readiness plan that is based on their assessment of the change target's state. For example, change agents can facilitate the movement of members experiencing change through the stages of the change process by identifying where those members and providing the appropriate information.

*Abilities instrument.* The driving force behind readiness research from the aspect of an individual's abilities has been the education discipline. Teachers have long been interested in assessing their students' readiness to learn new classroom material. Historically, the concept of readiness has been viewed as a psychological construct that indicated the extent to which the child is prepared for upcoming material (Holt, 2000). Thus, readiness in the classroom setting was originally seen as a cognitive ability that develops as a child matures (Nurss, 1979). More contemporary readiness instruments have suggested that a students' readiness to learn new material is ingrained in the minimum knowledge, skills, and abilities that the student must possess to be prepared for future curriculums. Based on this new perspective, readiness instruments have been designed to gauge the child's skills in specific areas that have been deemed necessary for success in a given learning situation (e.g., Barnhart, 1991).

Several instruments purport to assess an individual's knowledge, skills, and abilities. The Metropolitan Reading Test is one such instrument that contains items designed to evaluate skills that are fundamentally essential in learning how to read such as individual letters and word recognition. This instrument has demonstrated considerable psychometric properties corroborating its validity and reliability. An intriguing virtue of this instrument is that not only has it accurately predicted end-of-first grade performance on reading ability tests (Barnhart, 1991) as it was designed to do, it has performed equally well in predicting end-of-first grade mathematics ability (Nurss, 1979).

Unfortunately, these instruments demonstrate limited perspective by converging on the minimum knowledge, skills, and abilities perspective of measuring readiness.

With such a narrow focus, these instruments overlook other issues that may also significantly contribute to successful performance. For example, the attitudes and interests of the student are disregarded in all of the reading-readiness instruments. This can lead to misconceptions concerning the favorable results of the readiness instrument indicating that students are able to learn the material being taught, but fails to tap into the reality that many students may not be willing to spend the time necessary to master the material. While a person's knowledge, skills, and abilities will have a recognizable impact on their readiness for a proposed change, there are currently insufficient factors relating them to readiness. Therefore, by not measuring certain aspects of readiness, the Metropolitan Reading Test and the other reading-readiness instruments highlight another factor that may be critical to an individual's readiness when applied to an organizational setting, namely, self-efficacy, or the individual's minimum level of perceived capability. Holt (2000) suggest that the idea of self-efficacy may be more imperative in an organizational setting due to the fact that individuals may either have faith in their existing attributes or believe the organization's training programs can equip them with the necessary knowledge, skills, and abilities.

*Trait instruments*. Another individual readiness perspective engages the manner in which the individual's traits, or personal attributes, of individuals within an organization affect the way in which they respond to a proposed organizational change. Generally, these researchers have discussed readiness in the context of an individual's general outlook on the change itself and have constructed scales claiming to measure a person's general disposition toward innovation (e.g., Flynn et al., 1993) while others

investigators have focused on the extent to which an individual values change (e.g., Neal, 1965).

Trumbo's (1961) Change Attitude Scale is a predominately employed trait instrument that assesses readiness based on the individual's basic attitudes toward change in general and not toward a specific organizational change being implemented. An example item of the Change Attitude Scale is, "One can never feel at ease on a job where the ways of doing things are always being changed" (Trumbo, 1961, p. 339). The psychometric properties of Trumbo's instrument divulge the mixed evidence concerning the instrument's overall validity. Trumbo presents no information regarding the instrument's content or construct validity. However, data have suggested that Trumbo's (1961) instrument was correlated with an individual's social status (Faunce, 1960) and demographic characteristics (Trumbo, 1961). Additionally, the instrument's predictive validity was substantiated by Trumbo (1961) and Hardin (1967).

Hurt, Joseph, and Cook (1977) developed another trait instrument designed to assess readiness based on an individual's perception of their own innovativeness. Hurt et al.'s Innovativeness Scale evaluates four dimensions labeled *willing to try* (e.g., the extent to which the respondent is suspicious of new ways of thinking), *creative* (e.g., whether the respondent considers her/himself inventive), *opinion leader* (e.g., whether the individual considers him/herself an influential group member), and *ambiguities and problems* (e.g., whether the person is challenged by unanswered questions). The facet analysis of this instrument reveals a psychometrically sound instrument. Hurt et al. (1977) reported concurrent validity, convergent validity, and internally consistent reliability.

The four remaining individual trait instruments suffer considerably from a total lack of reported validity. In addition, only the instrument offered by Al-Khalaf (1994) reported an estimate of internal consistency reliability, which according to Hinkin (1998) is a minimum requirement for instruments applied in the social sciences.

The trait and personality approach to the measurement of readiness is significant in that it allows change agents to determine the proportion of individuals in an organization who are intrinsically averse to change. This provides valuable information when selecting from a variety of strategies available that can be tailored to create readiness in an organization. Along the continuum of an organization's sense of urgency, this aspect of readiness also allows the change agent to determine the speed with which an organizational change effort should be implemented. "An employee's response to change is probably conditioned by his perception of the way in which the effects of change related to his needs. If change as a general phenomenon is to be accepted, its effects must be perceived as generally more rewarding than unrewarding, that is they must provide need satisfaction" (Trumbo, 1961, p. 343). Thus, change agents looking to solicit a person's general attitude or disposition toward a change initiative must understand that these sentiments will most likely vary as a function of the specific situation and the specific change being implemented. Table 5 shows the facet analysis of the individual variables used in this research.

### *Summary of the Review of Existing Instruments*

This review of readiness instruments demonstrates the enormous effort that academic researchers and practitioners from various disciplines have used to assess readiness. Within each readiness perspective, valuable information has been extracted

Table 5

*Facet Analysis of the Individual Variables*

| | *Positive Affect* | *Negative Affect* | *Efficacy* | *Innovativeness* |
|---|---|---|---|---|
| 1. Source of the instrument | Watson et al. (1988) | Watson et al. (1988) | Holt (2002) | Hurt et al. (1977) |
| 2. Research discipline. | Organization Sciences | Organization Sciences | Organization Sciences | Organization sciences |
| 3. Item development. | Deductive | Deductive | Inductive | Deductive approach |
| 4. Content validity. | Review by judges | Review by judges | Review by expert judges<br>Q-factor Analysis from independent judges<br>Proportions of substantive validity | No evidence of content validity |
| 5. Predictive validity. | Predictive | Predictive | Predictive | Concurrent |
| 6. Construct validity. | EFA<br>Convergent validity | EFA<br>Convergent validity | EFA<br>CFA<br>Convergent validity | Convergent<br>EFA |
| 7. Reliability estimates. | Coefficient alpha<br>Test-retest | Coefficient alpha<br>Test-retest | Coefficient alpha | Coefficient alpha |
| 8. Scales | Rate frequency to which specific words describe different feelings and emotions on average.<br><br>Positive affect. "Interested." (10 words rated; $\alpha = .88$) | Rate frequency to which specific words describe different feelings and emotions on average.<br><br>Negative affect. "Irritable." (10 words rated; $\alpha = .87$) | Change efficacy. "When we implement this change, I feel I can handle it with ease." (6 items; $\alpha = .82$) | Willing to try. "I am suspicious of new inventions and new ways of thinking." (8 items, $\alpha = .84$) |
| 9. Key citations | -- | -- | -- | Goldsmith (1991) |

that can add value to the measurement of readiness for change. Unfortunately, no single instrument appeared to offer a valid, reliable, and comprehensive model of readiness (see Table 1). In fact, only two instruments, Burke et al.'s (1996) Lay of the Land Survey and McConnaughy et al.'s (1983) URICA, presented comprehensive evidence of content, construct, and predictive validity. Furthermore, only eight other instruments went through a discernable process to develop and review items, a necessary first step in the development of a new instrument to establish its content validity and only nine others reported evidence of construct validity, primarily through the use of exploratory factor analysis. Finally, regarding predictive validity, only four of the other instruments analyzed for this research reported any measure of predictive validity.

Far beyond providing generic insight regarding the general factors that influence readiness, the analysis of these instruments offered tremendous insight regarding the specific change variables required for an "ideal" comprehensive readiness instrument. For example, the instruments designed to gauge readiness by looking at the change content have indicated that individuals will evaluate the "appropriateness" of the change implementation. Internal context instruments have suggested the important role that "leadership support" plays in creating readiness. Change instruments purportedly measuring readiness by concentrating on the individual aspects have suggested that a recognized need for change (i.e., discrepancy) and a belief in one's ability to implement change (i.e., self-efficacy) may be critical to readiness (Holt, 2000).

Unfortunately, the information represented by Table 1 demonstrates that very few instruments comprehensively measure all four aspects of readiness. By only focusing on only one or two readiness perspectives, change agents will fail to capture the "big

picture" and may ultimately create an avenue for failure. Based on this notion, these instruments have collectively suggested the utility, appropriateness, and most importantly, the *need* for a comprehensive measurement model that encompasses all four perspectives that influence readiness (see Figure 1).

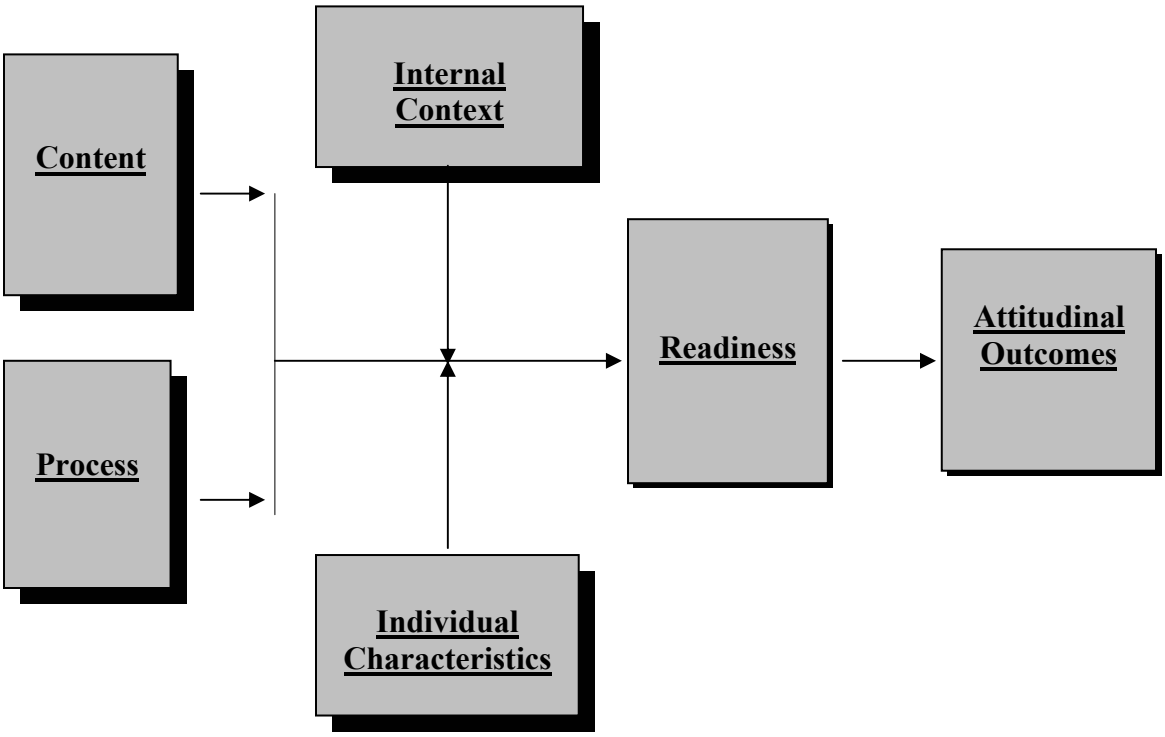


**Figure 1. Comprehensive model of readiness.**

As shown in Table 1, very few instruments measure more than one or two aspects of readiness. In fact, only Bedell's (1985) Decision Determinate instrument taps into every aspect of readiness but, as already mentioned, is limited by its psychometric properties. The Human Resource Development Press' (1995) ChangeAbilitator, Siegel and Kaemmerer's (1978) receptivity to change instrument, and Willey's (1991) faculty readiness survey are three instruments that all tap into the process, context, and individual

aspects of readiness. Finally, Harvey's (1990) Checklist for Change measures content, process, and context aspects of readiness. Unfortunately, all of these instruments are again limited by certain weaknesses within their psychometric properties and their lack of significant follow-up research. It became evident that a more fruitful approach to creating a comprehensive readiness instrument lay in the use of several of the most reliable and valid instruments to sufficiently represent the four main readiness aspects as well as the measurement variables within each aspect. The next section will explain the methodology used to construct the comprehensive instrument used in this research.

## II. Method

### *Sample*

The targeted population for this research was personnel working within the Aeronautical Systems Command's Contracting Directorate (ASC/PK) with a vested interest in a series of "Knowledge Management" (KM) initiatives designed to increase the efficiency and effectiveness of the organization by leveraging the shared knowledge of the organizational members. It was anticipated that targeting individuals with a sincere interest in the effects of the change would amplify participation, increasing the value of this research to both the researcher and ASC/PK Senior leadership.

### *Demographics*

One hundred and forty-six civilian and military personnel of various grade levels and responsibilities completed the questionnaire. The average age of the respondents was 43.4 years (*SD* = 9.6 years). Of the 117 respondents who indicated their gender, 42% were female and 58% were male. Military personnel comprised 13.7% of the respondents while 86.3% were civilians. Of the 117 respondents who indicated their supervisory status, 27.4% supervise other ASC/PK personnel where the supervisors lead 5.4 people (*SD* = 9.2), on average. Educational levels ranged from high school graduate to post-doctoral educational levels. Of the 116 respondents that indicated their level of education, 6.9% had a High School diploma, 1.7% had an Associate's degree, 38.8% had a Bachelor's degree, 51.7% had a Master's degree, and 0.9% had a Doctorate degree. As with educational level, an array of occupations was represented such as administrative specialists, buyer, and manager. On average, the respondents had (a) worked for the

organization for 12.3 years (*SD* = 9.8 years), (b) worked in their current position for 3.0 years (*SD* = 3.7 years), and (c) had 12.7 more years until retirement. Finally, the respondents reported that 2.7 organizational levels separated themselves from Mr. Ross, the executive director, indicating that a cross sectional sample may have been tapped.

### *Organizational Setting*

Senior leadership, through the Secretary of Defense, Mr. Donald Rumsfeld, has initiated an effort to transform activities throughout the Department of Defense (DoD). The mandated changes are broad-based and affect every major area of operations. The specific transformations go beyond technological and process improvements and include both changes intrinsic within the DoD and in widespread use in the commercial business sector. For instance, in the United States Air Force (USAF), the Chief Information Officer is currently working on developing and implementing enterprise level Knowledge Management (KM) strategies. Originated in the commercial sector, KM is the concept of increasing the efficiencies and effectiveness of an organization by leveraging the shared knowledge of the organizational members, which can translate into time and cost savings.

Under the umbrella of USAF enterprise level KM projects there exists a myriad of organizational level projects. Specifically, this research focused on the implementation of KM initiatives within ASC/PK. Although ASC/PK has initiated several KM projects, the relative success or failure of these projects is yet undetermined. With several new KM projects on the horizon, determining the readiness of ASC/PK members appeared to be a fruitful avenue for testing the comprehensive model of change.

### *Procedure*

Data were collected through two alternative methods. Originally, the questionnaire was sent to 722 individuals as an attachment to an e-mail containing all relevant information and expressing the strict confidentiality of their responses. Participants were able to open the questionnaire, print a copy, complete the questionnaire, and return it to the researcher via inter-office mail. Response rates were monitored over a three-week period and follow-up emails were sent as necessary to remind participants of the questionnaire. In addition, the questionnaire was placed on a server within the Air Force Institute of Technology's internal network and the participants were able to access the survey from their own desktop computers. Participants were informed of the web-based questionnaire via an email sent by the researcher that contained identical information as the original e-mail. For both methods, participants were asked to create an eight-digit alphanumeric "password" that will allow for additional analysis on follow-up surveys. A total of 146 surveys were accumulated between the e-mail and web-based questionnaires for a response rate of 20.2%.

### *Measures*

The following sections break down the change themes for this research and sub-categories of variables that were used for measurement including the source of the items, the number of items, an example of the items, and a discussion of the statistical estimates of reliability pertaining to the items used. The change *content*, *process*, *context*, and *individual* aspects were the four main categories of variables measured. Unless otherwise specified, participants responded to items by expressing their agreement using a 7-point Likert-type rating format (from 1 = strongly disagree to 7 = strongly agree).

*Content*

The first theme of interest was the *content* of the proposed change. More easily understood as the "what" was being changed, content variables measured whether or not the participants felt there was a need for change and if they, in general, believed the change would benefit the organization. The three change context variables measured were change evaluation, appropriateness, and personal valence.

*Change evaluation*. An eight-item semantic differential scale developed by Kazlow (1977) was used to measure each participant's overall evaluation of the change. The scale involved paired bi-polar adjectives used to determine the strength of the participant's feelings toward the impending change. A seven point scale was utilized, three points on one side indicating intensity of feeling in one direction (i.e. bad), the middle point standing for neutral, and the three points on the other side representing stronger feelings in the opposite direction (i.e. good). An example of an adjective pair was, "Progressive, Regressive." No specific estimates of reliability were provided by Kazlow. However, she does make reference to appropriate literary discussions concerning the reliability and validity of using semantic differential scales. In this research, these items produced a Cronbach's coefficient alpha of .89.

*Appropriateness.* Ten items developed by Holt (2002) were used to measure the appropriateness of the change. These items represented the extent to which one felt that the change effort was legitimate and appropriate for the organization to meet its objectives. An example item was, "I think that the organization will benefit from this change." To determine the internal consistency of these items, Holt (2002) conducted

two different organizational studies, which resulted in coefficient alphas of .94 and .80 respectively. In this research, these items produced a Cronbach's coefficient alpha of .91.

*Personal valence.* Six items developed by Holt (2002) were used to measure valence. These items represent the extent to which a person feels that he or she will personally benefit from the implementation of the prospective change. An example item was, "After this change, I expect to be recognized more for the work I do." As with the appropriateness items, Holt (2002) subjected these items to two organizational studies to determine their internal reliability. The results were coefficient alphas of .66 and .65 respectively. While these scores are slightly lower than the standard minimum alpha of .70 (DeVellis, 1991; Nunnally & Bernstein, 1994), they were retained to further explore their impact on determining readiness. Their reliability results for this research produced a Cronbach's coefficient alpha of .62, which was relatively close to prior research.

*Process*

The change *process* was a second theme of interest. Specifically, these variables represented "how" the change was being implemented by assessing the participants' perception concerning their senior leadership's involvement and commitment to the change. Four change process variables were measured to include: (a) management support, (b) participation, (c) communication climate, and (d) quality of the information.

*Management support.* Six items developed by Holt (2002) were used to measure the extent to which one felt the organization's leadership and management was committed to and supported implementation of the prospective change. An example item was, "Our organization's top decision-makers have put all their support behind this change effort." To determine the internal reliability of these items, Holt (2002) included

the items in two organizational studies. The resulting coefficient alphas were .87 and .79 respectively. In this research, these items produced a Cronbach's coefficient alpha of .84.

*Participation.* Four items developed by Wanberg and Banas (2000) were used to measure participation. These items represented to what extent a respondent felt that he or she provided input and was allowed to participate in the change process. An example item was, "I had some control over the changes that were proposed." As a result of their confirmatory factor analysis, Wanberg and Banas reported a .72 coefficient alpha for the reliability of these items. In this research, these items produced a Cronbach's coefficient alpha of .77.

*Communication climate.* Four items developed by Miller, Johnson, and Grau (1994) were used to measure the organization's communication. These items represented the extent to which respondents felt they received necessary information through informal networks of information transfer consisting primarily of coworkers and supervisors. Higher scores would indicate effective communications within ASC/PK. An example item was, "I am thoroughly satisfied with the information I receive about what's going on at AFMC." A Cronbach's coefficient alpha of .79 was reported by Miller et al. (1994) regarding the reliability of these items. For this research, these items produced a Cronbach's coefficient alpha of .78.

*Quality of information.* Three items developed by Miller et al. (1994) were used to assess the quality of information transferred. These items represented the extent to which one felt that he or she had useful and meaningful information throughout the change process. An example item was, "The information I received about this change

was timely." Miller et al. (1994) reported a Cronbach's coefficient alpha of .86 for these items. In this research, these items produced a Cronbach's coefficient alpha of .82.

*Individual*

A third theme of interest was psychologically based and tapped the *individual* aspects of the change. More commonly understood as the "who" of organizational change, positive affect, negative affect, efficacy, and innovativeness were measured.

*Positive affect.* Ten items developed by Watson, Clark, and Tellegen (1988) were used to measure the participant's disposition toward the impending change. These items represented the extent to which respondents were disposed to feeling enthusiastic, active, and alert. Higher scores indicated higher levels of energy, full concentration, and pleasurable engagement. This measure employed a five-point scale with labels of *very slightly or not at all, a little, moderately, quite a bit, and very much,* respectively. To establish reliability, Watson et al. had their participants express the extent to which they had felt or experienced each mood over several specified time frames (i.e. during the past few weeks, during the past few days). An example item was, "Interested." For the college students tested in their research, they reported Cronbach's coefficient alphas ranging from .86 to .90 over the various specified time frames. In this research, these items produced a Cronbach's coefficient alpha of .95.

*Negative affect.* Ten items developed by Watson et al. (1988) were used. These items represented the extent to which respondents felt a variety of adverse mood states that include anger, contempt, disgust, fear, and nervousness. Higher scores indicated general levels of distress. The same five-point scale used for "positive affect" was utilized. An example item was, "Nervous." Reliability procedures were identical to the

positive affect items above and for the college students tested in their research, Cronbach's coefficient alphas ranging from .84 to .87 were reported over the specified time frames. In this research, these items produced a Cronbach's coefficient alpha of .87.

*Efficacy.* Six items developed by Holt (2002) were used to measure efficacy. These items represented the extent to which one felt that he or she has the skills and will be able to execute the tasks and activities that are associated with the implementation of the prospective change. An example item was, "I do not anticipate any problems adjusting to the work I will have when this change is adopted." To establish internal reliability of these items, Holt (2002) reported coefficient alphas of .82 and .79 in two separate organizational studies. In this research, these items produced a Cronbach's coefficient alpha of .84.

*Innovativeness.* Eight items developed by Hurt, Joseph, and Cook (1977) were used. These items represented whether or not the respondent felt an underlying personality construct, which was interpreted as a willingness to change. An example item was, "I rarely trust new ideas until I can see whether the vast majority of people around me accept them." To establish reliability, Hurt et al. (1977) employed a technique developed by Nunnally (1967) whereby all possible split-half comparisons are made, which resulted in a score of .94 for their items. In this research, these items produced a Cronbach's coefficient alpha of .84.

*Context*

The *context* of the change was another area of interest. These variables represented "why" an organization was changing and can reveal both internal and external circumstances that dictate a change was necessary based on organizational

effectiveness. As a part of the Department of Defense, ASC/PK's current organizational role was essentially without competition, guiding this research to focus only on internal contextual constructs. Perceived organizational support, discrepancy, and principal support were change context variables measured.

*Perceived organizational support.* Six items developed by Eisenberger, Huntington, Hutchison, and Sowa (1986) were used. These items represented the extent to which respondents felt the organization valued their contributions, treated them favorably, and cared about their well-being. Higher scores indicated that respondents felt the organization was committed to them. An example item was, "The organization is willing to extend itself in order to help me perform my job to the best of my ability." In their original study, Eisenberger et al. (1986) used a 32-item instrument to measure perceived organizational support, reporting a coefficient alpha of .93. Following the lead of other more recent research measuring perceived organizational support, this research utilized an abbreviated construct composed of the top six items from Eisenberger et al.'s (1986) research. For instance, Wayne, Shore, Bommer, and Tetrick (2002) used a nine-item variation of Eisenberger's scale that produced a coefficient alpha of .92 in their study. The reliability coefficient of the scale employed in this study was .92.

*Discrepancy.* Three items developed by Self and Armenakis (Personal communication, 2002) as part of an unpublished study were used to explore discrepancy. These items measured the extent to which one felt that the organization needed to change. An example item was, "Our organization has problems that need to be addressed." Because these items were newly developed, no reliability information was available. The data from this study, however, resulted in an estimate of internal consistency of -.19 (i.e.,

coefficient alpha). Clearly, these results suggested that multiple constructs may be tapped by this three-item scale and further work should be done before this scale can be used in field setting. Because reliability is a prerequisite for validity and a dismal reliability estimate was observed, this scale was removed from the subsequent analysis reported in next chapter.

*Principal support.* Two items developed by Self and Armenakis (Personal communication, 2002) in an unpublished study were used to measure principal support. These items measured the extent to which one felt peers and managers supported the change effort. An example item was, "The manager of my unit was committed to making the change effort a success." No reliability data for these items has been published. In this research, these items produced a Cronbach's coefficient alpha of .65 which showed potential for a two-item scale.

In addition to the four main themes of interest already discussed, two more areas of interest were explored in this research. These were classified as readiness and attitudinal outcome and are described in the following paragraphs.

*Readiness*

Readiness variables were used to measure how strongly members identified with the change effort and its goal as an indication of their "readiness" for the change initiatives. A three-component model of change commitment and pessimism were measured.

*Change commitment.* Eighteen items developed by Herscovitch and Meyer (2002) were used to measure organizational member's commitment to the change. Six separate items were used to measure affective commitment, continuance commitment,

and normative commitment, respectively. Collectively, these items represented the extent to which respondents demonstrated behavioral support for the change. Affective commitment can be more easily thought of as a desire to support the change initiative based on a belief in the change's inherent benefits. Continuance commitment can be more easily thought of as the recognition that there will be costs associated with failure to provide support for a change initiative. Finally, normative commitment can be more easily thought of as a feeling of obligation to go along with the change initiative. An example of an affective commitment item was, "This change is a good strategy for this organization." The alpha coefficients reported by Herscovitch and Meyer for their six-item affective, continuance, and normative commitment to change scales were .94, .94, and .86 respectively. In this research, these items produced Cronbach's coefficient alpha of .88, .74, and .64 respectively. The normative change commitment score of .64 was slightly below the recommended .70 threshold.

*Pessimism.* Four items developed by Wanous, Reichers and Austin (2000) to study cynicism about organizational change were used. These items measured the extent to which respondents felt pessimistic toward the impending change. An example item was, "Most of the programs that are supposed to solve problems around here will not do much good." Based on their confirmatory factor analysis conducted with a RAMONA program, Wanous et al. (2000) reported a reliability coefficient alpha of .86 for these items. In this research, these items produced a Cronbach's coefficient alpha of .83. Table 6 shows the facet analysis of the readiness variables used in this research.

Table 6

*Facet Analysis of the Readiness Variables*

| | *Pessimism* | *Change Commitment* |
|---|---|---|
| 1. Source of the instrument | Wanous, Reichers, & Austin (2000) | Hersocovitch & Meyer (2002) |
| 2. Research discipline. | Organization Sciences | Organization sciences |
| 3. Item development. | Inductive approach | Deductive approach |
| 4. Content validity. | Review by expert judges | No evidence of review |
| 5. Predictive validity. | No evidence of predictive validity | No evidence of predictive validity |
| 6. Construct validity. | CFA<br>Convergent Validity | EFA |
| 7. Reliability estimates. | Coefficient alpha | Coefficient alpha |
| 8. Scales | Pessimism. "Plans for future improvement will not amount to much." (4 items, $\alpha = .83$) | Continuance commitment to change. "I feel pressure to go along with this change." (6 items, $\alpha = .94$)<br>Normative commitment to change. "I feel a sense of duty to work toward this change." (6 items, $\alpha = .86$)<br>Affective commitment to change. "I believe in the value of this change." (6 items, $\alpha = .94$) |
| 9. Key citations | Reichers, Wanous, & Austin (1997) | No other studies were identified |

*Attitudinal outcome*

The final research theme of interest was the *attitudinal outcome* toward the impending change. These variables focused on the members' feelings toward their job and their intentions of whether or not to leave the organization because of the change being implemented. Job satisfaction, turnover intentions, and change anxiety were measured.

*Job satisfaction.* Three items designed by Cammann, Fichman, Jenkins, and Klesh (1983) were used. These items measured the extent to which respondents view their job positively. Higher scores indicated overall satisfaction with the job. An example item was, "In general, I like working here." In their research, Camman et al. (1983) reported a coefficient alpha of .77 for these items. In this research, these items produced a Cronbach's coefficient alpha of .90.

*Turnover intentions.* Three items developed by Cammann, et al. (1983) were used. These items measured the extent to which respondents intended to leave the organization. Higher scores indicated the intention to leave while low scores indicated a propensity to continue organizational membership. An example item was, "I am actively looking for a job outside of ASC/PK." Cammann et al. (1983) reported a coefficient alpha of .83 for these items. In this research, these items produced a Cronbach's coefficient alpha of .85.

*Change anxiety.* Three items developed by Miller et al. (1994) were used. These items measured the extent to which respondents were concerned or anxious about the impending change. Miller et al. (1994) stated that, "anxiety is a key element in the theoretical model of factors affecting attitudes toward change" (p. 72). Higher scores

indicated little anxiety associated with the change. An example item was, "I feel anxious about the implementation of this change." In their analysis, Miller et al. (1994) reported a Cronbach's coefficient alpha of 0.51 for these items. Although this was far below the recommended minimum of .70, these items were used in this research to further explore their psychometric properties. In this research, these items produced a Cronbach's coefficient alpha of .66, and while this is still below .70, it was a marked improvement over previous research. Table 7 shows the facet analysis for the attitudinal outcome variables used in this research.

### *Summary*

In summary, ASC/PK was an organization actively engaged in several transformations of business activities to include the implementation of KM initiatives to increase the effectiveness and efficiency of the organization. To date, the relative success of these initiatives is yet undetermined. This research identified four main perspectives of research used to determine an organization's readiness for change and the associated variables that were used in this study to evaluate each perspective within ASC/PK. The next chapter will discuss the analytical procedures used to explore the psychometric properties of the comprehensive readiness instrument utilized in this research.

Table 7

*Facet Analysis of the Attitudinal Outcome Variables*

| | *Job Satisfaction* | *Turnover Intentions* | *Change Anxiety* |
|---|---|---|---|
| 1. Source of the instrument | Cammann et al. (1983) | Cammann et al. (1983) | Miller et al. (1994) |
| 2. Research discipline | Organizational sciences | Organizational sciences | Organization Sciences |
| 3. Item development | Inductive | Inductive | Deductive |
| 4. Content validity | Review by expert judges | Review by expert judges | Reviewed by expert judges |
| 5. Predictive validity | No evidence of predictive validity | No evidence of predictive validity | No evidence of predictive validity |
| 6. Construct validity | EFA | EFA | EFA<br>Convergent |
| 7. Reliability estimates | Coefficient alpha | Coefficient alpha | Coefficient alpha |
| 8. Scales | Global job satisfaction. "All in all, I am satisfied with my job." (3 items; a = .77) | Intention to turnover. "I often think about quitting." (3 items; a = .83). | Anxiety. "I feel anxious about the implementation of this change." (3 items; a = .51) |
| 9. Key citations | -- | -- | -- |

*Note.* EFA = Exploratory factor analysis.

## III. Results

### *Descriptive Statistics*

*Analysis of mean scores*

The descriptive statistics contained in Table 6 reflect several salient findings related to the mean scores and their associated standard deviations. In general, the content variables demonstrated the strength of the participant's feelings toward the KM initiatives (change evaluation), how legitimate and appropriate the KM initiatives were for the organization to meet its objectives (appropriateness), and the extent to which a person felt they would personally benefit from the implementation of the KM initiatives (personal valence). The scores of those three variables, appropriateness ($M$ = 5.42, $SD$ = .87), valence ($M$ = 4.99, $SD$ = .78), and change evaluation ($M$ = 5.53, $SD$ = 1.13) reflected favorably on the KM initiatives. The respondents agreed that the initiatives were appropriate and that they would benefit from the initiatives. More generally, they felt good about the KM initiatives.

Overall, the participants demonstrated a more neutral position concerning the process used to implement KM initiatives. The scores for the process variables were (a) management support ($M$ = 4.26, $SD$ = 1.05), (b) participation ($M$ = 4.14, $SD$ = 1.16), (c) communication climate ($M$ = 4.22, $SD$ = 1.28), and (d) quality of information ($M$ = 3.77, $SD$ = 1.33). While the quality of information variable was the only variable that slightly disagreed, all four variables were close in proximity to the "neither agree or disagree" response option.

The context variables were used to gauge general attitude about the organization by measuring the extent to which respondents felt the organization valued their

Table 8

*Descriptive Statistics and Correlation Matrix*

| Variables | M | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Content** | | | | | | | | | | | | | | | | | | | | | | |
| *1. Appropriateness* | 5.42 | 0.87 | **(.91)** | | | | | | | | | | | | | | | | | | | |
| *2. Valence* | 4.99 | 0.78 | .66 | **(.62)** | | | | | | | | | | | | | | | | | | |
| *3. Semantic Differential* | 5.53 | 1.13 | .74 | .54 | **(.89)** | | | | | | | | | | | | | | | | | |
| **Process** | | | | | | | | | | | | | | | | | | | | | | |
| *4. Management Support* | 4.26 | 1.05 | .50 | .48 | .32 | **(.84)** | | | | | | | | | | | | | | | | |
| *5. Participation* | 4.14 | 1.16 | .55 | .43 | .51 | .64 | **(.77)** | | | | | | | | | | | | | | | |
| *6. Communication Climate* | 4.22 | 1.28 | .47 | .33 | .40 | .65 | .71 | **(.78)** | | | | | | | | | | | | | | |
| *7. Quality of Information* | 3.77 | 1.33 | .56 | .34 | .42 | .71 | .68 | .57 | **(.82)** | | | | | | | | | | | | | |
| **Contextual** | | | | | | | | | | | | | | | | | | | | | | |
| *8. Perceived Org Support* | 4.44 | 1.33 | .45 | .37 | .39 | .63 | .77 | .75 | .55 | **(.92)** | | | | | | | | | | | | |
| *9. Principal Support* | 4.55 | 1.09 | .61 | .44 | .53 | .71 | .73 | .71 | .69 | .69 | **(.65)** | | | | | | | | | | | |
| **Individual** | | | | | | | | | | | | | | | | | | | | | | |
| *10. Positive Affect* | 3.34 | 0.97 | .55 | .49 | .42 | .37 | .39 | .33 | .40 | .38 | .45 | **(.95)** | | | | | | | | | | |
| *11. Negative Affect* | 1.43 | 0.47 | -.42 | -.17 | -.35 | -.13 | -.31 | -.26 | -.21 | -.29 | -.42 | -.10 | **(.87)** | | | | | | | | | |
| *12. Efficacy* | 5.39 | 0.93 | .69 | .64 | .56 | .28 | .40 | .26 | .28 | .36 | .40 | .51 | -.33 | **(.84)** | | | | | | | | |
| *13. Innovativeness* | 2.93 | 0.92 | -.42 | -.21 | -.31 | -.17 | -.28 | -.30 | -.01 | -.29 | -.21 | -.47 | .26 | -.45 | **(.84)** | | | | | | | |
| **Attitudinal Outcome** | | | | | | | | | | | | | | | | | | | | | | |
| *14. Job Satisfaction* | 5.47 | 1.32 | .41 | .37 | .33 | .46 | .57 | .55 | .42 | .73 | .61 | .43 | -.30 | .31 | -.26 | **(.90)** | | | | | | |
| *15. Change Anxiety* | 5.14 | 1.10 | .56 | .55 | .46 | .28 | .43 | .40 | .22 | .33 | .38 | .45 | -.45 | .66 | -.47 | .21 | **(.66)** | | | | | |
| *16. Turnover Intentions* | 2.34 | 1.46 | -.23 | -.27 | -.23 | -.38 | -.38 | -.45 | -.27 | -.54 | -.48 | -.24 | .17 | -.21 | .11 | -.73 | -.13 | **(.85)** | | | | |
| **Readiness** | | | | | | | | | | | | | | | | | | | | | | |
| *17. Pessimism* | 3.26 | 1.22 | -.60 | -.44 | -.47 | -.61 | -.68 | -.68 | -.50 | -.69 | -.58 | -.40 | .20 | -.42 | .51 | -.51 | -.40 | .36 | **(.83)** | | | |
| *18. CC Affective* | 5.50 | 0.86 | .90 | .62 | .74 | .46 | .51 | .45 | .49 | .45 | .50 | .61 | -.31 | .64 | -.42 | .40 | .54 | -.23 | -.55 | **(.88)** | | |
| *19. CC Continuance* | 4.06 | 1.05 | -.30 | -.24 | -.33 | -.29 | -.58 | -.36 | -.34 | -.55 | -.37 | -.08 | .43 | -.28 | .26 | -.29 | -.44 | .06 | .44 | -.29 | **(.74)** | |
| *20. CC Normative* | 4.37 | 0.90 | .37 | .23 | .27 | .23 | .19 | .20 | .37 | .13 | .25 | .30 | .16 | .18 | .04 | .14 | -.04 | -.19 | -.31 | .31 | .31 | **(.64)** |

Note. N = 117 - 124 due to missing data. Reliabilities (coefficient alpha) are shown in parentheses along the diagonal. All correlations with an absolute value greater than or equal to .18 are significant at $p < .05$.

contributions, treated them favorably, and cared about their well-being as well as the extent respondents felt peers and managers supported the change effort. The scores for perceived organizational support ($M$ = 4.44, $SD$ = 1.33) and principal support ($M$ = 4.55, $SD$ = 1.09) reflected moderately agreeable attitudes related to why the changes are needed.

The individual variables were used to measure whether the respondents had a favorable or negative disposition toward KM initiatives, the extent to which they felt they have the skills and would be able to execute the KM tasks and activities (i.e. efficacy and innovativeness), and that they were in fact willing to change. As a reminder, both positive affect ($M$ = 3.34, $SD$ = .97) and negative affect ($M$ = 1.43, $SD$ = .47) used a five-point scale that consisted of *very slightly or not at all, a little, moderately, quite a bit, and very much* as possible responses. The results indicated that participants had predominantly, positive dispositions. As far as efficacy ($M$ = 5.39, $SD$ = .93) and innovativeness ($M$ = 2.93, $SD$ = .92) were concerned, the respondents generally felt they were competent and willing to participate in KM initiatives.

The readiness variables used in the current study measured organizational member's commitment to the KM initiatives and the extent to which they felt pessimistic. The scores for affective commitment ($M$ = 5.50, $SD$ = .86), continuance commitment ($M$ = 4.06, $SD$ = 1.05), normative commitment ($M$ = 4.37, $SD$ = .90), and pessimism ($M$ = 3.26, $SD$ = 1.22) moderately demonstrated the participants' commitment toward the KM initiatives and a noticeable lack of pessimism, an encouraging finding for leaders. Taking a more general perspective, the last set of variables focused on the members' feelings toward their job, their intentions to stay or leave the organization, and the amount of

concern or anxiety they felt. The scores for job satisfaction ($M$ = 5.47, $SD$ = 1.32), turnover intentions ($M$ = 2.34, $SD$ = 1.46), and change anxiety ($M$ = 5.14, $SD$ = 1.10), generally indicated that respondents were satisfied with their current position, were not thinking about leaving the organization, and felt little anxiety related to the implementation of KM initiatives.

*Analysis of bi-variate relationships*

The bi-variate relationships among the study variables are shown in Table 6. These demonstrate the strength and direction of the linear relationships between each of the study variables. Based on a pairwise comparison, all correlations with values greater than or equal to .18 were significant ($p < .05$). Because readiness was the focal issue in this study, this discussion will be limited to the relationship between readiness and other study variables. In general, the readiness variables exhibited strong relationships with the majority of the content, process, context, and individual variables.

Beginning with pessimism, which measured the extent to which respondents felt pessimistic toward the change initiatives, results were in the expected direction. For instance, pessimism was positively related to individual characteristics like negative affect and innovativeness where $r$ = .20, and .51 respectively. In addition, pessimism was negatively related with all other individual, content, context and process variables ranging from $r$ = -.40 with positive affect to $r$ = -.69 with perceived organizational support. This was expected since the other variables were composed of optimistically worded items.

The next readiness variable was affective change commitment, which measured the participants' commitment in terms of their desire to provide support for the change

based on their belief in its inherent benefits. Again, the results were in the expected direction. Affective change commitment was negatively related to negative affect and innovativeness where $r$ = -.31, and -.42 respectively. It was positively related with all other study variables ranging perceived organizational support ($r$ = .45) to extremely strong relationships with change evaluation ($r$ = .74) and appropriateness ($r$ = .90).

The bi-variate relationships for continuance change commitment, which measured the participants' commitment in terms of the perceived cost of leaving the organization due to the changes, were in the expected directions. It had a positive relationship with negative affect and innovativeness where $r$ = .43, and .26 respectively. Although continuance commitment's negative relationship with positive affect was statistically insignificant, it was significantly and negatively related to all other individual, content, context, and process variables ranging from valence ($r$ = -.24) to participation ($r$ = -.58).

The final readiness variable was normative change commitment, which measured the participants' commitment in terms of their positive feelings about the change and a sense of obligation to take part in it. The results for this variable were slightly mixed. Normative commitment was positively related to all of the content, process, context, and individual variables. Even though it had an unexpectedly positive relationship with negative affect ($r$ = .16) and innovativeness ($r$ = .04), the correlations were statistically insignificant.

Beyond the relationship exhibited between the readiness variables and the four main perspectives of readiness, the relationship the readiness variables demonstrated as a mediator for the attitudinal outcome variables was of interest. The first attitudinal outcome variable, job satisfaction, was significantly and negatively correlated with

pessimism ($r$ = -.51) and continuance commitment ($r$ = -.29). Job satisfaction was also significantly and positively correlated with affective continuance ($r$ = .40). Next, change anxiety was significantly and negatively correlated with pessimism ($r$ = -.40) and continuance commitment ($r$ = -.44) and positively correlated with affective continuance ($r$ = .54). Finally, turnover intentions was significantly and positively correlated with pessimism ($r$ = .36) and negatively correlated with affective continuance ($r$ = -.23) and normative continuance ($r$ = -.19). These relationships were all in the expected direction.

## *Regression Analysis*

### *Hierarchical Regression*

In addition to the analysis provided by the bi-variate correlations, multiple regressions were used to gain greater insight into the patterns of relationships between the four readiness variables and the content, process, context, and individual variables. Typically, individual and context variables represent factors more deeply rooted into the organization fabric, and as a result, are influential and difficult to change. Therefore, the variance shared by the readiness factors and the individual variables was explored first. Second, after controlling for the variation that could be attributed to the individual variables, the incremental variance the contextual variables contributed was explored. After controlling for the variation that could be attributed to the relevant individual and contextual variables, the incremental variance that the content variables shared with the readiness variables was examined. Finally, after controlling for the variation that could be contributed to the relevant individual, contextual, and content variables, the incremental variance that the process variables shared with the readiness variables was examined.

Due to the significant correlations exhibited in Table 6, the variance inflation factor (VIF) was computed for all variables to determine whether multicollinearity presented a problem before conducting this regression analysis. For instance, among the content variables, appropriateness is strongly correlated with valence ($r$ = .66) and the semantic differential scales ($r$ = .74). With all the individual, context, content, and process variables regressed against pessimism, the VIF scores for the content variables were 4.68 for appropriateness, 2.71 for personal valence, and 2.52 for the semantic differential scales. For the process variables, the VIF scores were 3.49 for management support, 3.79 for participation, 3.19 for communication climate, and 3.65 for quality of information. For the contextual variables, the VIF scores were 3.32 for perceived organizational support and 4.08 for principal support. Finally, for the individual variables, the VIF scores were 2.11 for positive affect, 1.59 for negative affect, 2.64 for efficacy, and 2.15 for innovativeness. The VIF scores were well below the 10.0 threshold indicating that multicollinearity among the respective variable sets was not a concern (Neter, Kutner, Nachtsheim, & Wasserman, 1996).

The regression results shown in Table 7 reveal the outcomes of the hierarchical regression used to test the incremental contributions the factors made in the prediction of the readiness for change factors in the sequence mentioned. In the first step of this analysis, the individual variables were entered to predict each of the readiness variables. Based on the $R^2$ reported in Table 7, the analysis indicated that the individual variables significantly explained 28% ($p < .01$) of the variance for pessimism, 51% ($p < .01$) for affective commitment, 22% ($p < .01$) for continuance commitment, and 19% ($p < .01$) for normative commitment. Next, the context variables were added to ascertain the extent to

Table 9

*Results of Hierarchical Regression*

| | Pessimism | | | | Affective Commitment | | | |
|---|---|---|---|---|---|---|---|---|
| | Equation (Standardized β) | | | | Equation (Standardized β) | | | |
| Variable | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Individual | | | | | | | | |
| Positive affect | -.15 | .04 | .17 | .14 | .38** | .30** | .15* | .17** |
| Negative affect | .02 | -.14 | -.19* | -.15 | -.06 | .01 | .04 | .02 |
| Efficacy | -.22* | -.11 | .13 | .07 | .40** | .36** | -.03 | -.01 |
| Innovativeness | .29** | .34** | .37** | .34** | -.07 | -.10 | -.02 | .01 |
| Context | | | | | | | | |
| Perceived organizational support | | -.50** | -.46** | -.28* | | .06 | .10 | .07 |
| Principal support | | -.19* | -.13 | .06 | | .18 | -.17* | -.24** |
| Content | | | | | | | | |
| Appropriateness | | | -.37** | -.29* | | | .75** | .73** |
| Valence | | | -.09 | -.05 | | | .02 | -.02 |
| Change evaluation | | | .01 | -.01 | | | .20** | .22** |
| Process | | | | | | | | |
| Management support | | | | -.11 | | | | .10 |
| Participation | | | | -.17 | | | | -.01 |
| Communication climate | | | | -.14 | | | | .05 |
| Quality of information | | | | -.03 | | | | -.02 |
| $R^2$ | .28** | .61** | .68** | .71** | 0.51** | .55** | .86** | .86** |
| $\Delta R^2$ | - | .33** | .07 | .03 | - | .04* | .31** | 0 |

*p < .05, **p < .01

Table 9 Continued

*Results of Hierarchical Regression*

| | Continuance Commitment Equation (Standardized β) | | | | Normative Commitment Equation (Standardized β) | | | |
|---|---|---|---|---|---|---|---|---|
| Variable | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Individual | | | | | | | | |
| Positive affect | -.01 | .08 | .23 | .27* | .36** | .29** | .16 | .13 |
| Negative affect | .33** | .27** | .28** | .28** | .18* | .25* | .37** | .37** |
| Efficacy | -.10 | -.04 | -.05 | -.02 | .17 | .13 | -.03 | -.03 |
| Innovativeness | .17 | .19* | .14 | .22* | .26* | .23* | .24* | .18 |
| Context | | | | | | | | |
| Perceived organizational support | | -.37** | -.52** | -.40** | | -.06 | -.06 | -.08 |
| Principal support | | .01 | .09 | .18 | | .24 | .14 | .13 |
| Content | | | | | | | | |
| Appropriateness | | | .16 | .24 | | | .56** | .50* |
| Valence | | | -.12 | -.16 | | | -.14 | -.06 |
| Change evaluation | | | -.17 | -.11 | | | .03 | .01 |
| Process | | | | | | | | |
| Management support | | | | .08 | | | | -.18 |
| Participation | | | | -.43** | | | | -.08 |
| Communication climate | | | | .23 | | | | .12 |
| Quality of information | | | | -.22 | | | | .22 |
| $R^2$ | .22** | .33** | .44** | .54** | .19** | .22** | .32** | .34** |
| $\Delta R^2$ | - | .11** | .11 | .10** | - | .03 | .10 | .02 |

*p < .05, **p < .01

which these variables explained unique variation in the readiness variables. This analysis indicated that the addition of the context variables in step two increased the explained variance of pessimism ($\Delta R^2 = .33$, $p < .01$), affective commitment ($\Delta R^2 = .04$, $p < .05$), and continuance commitment ($\Delta R^2 = .11$, $p < .01$). However, the increase for normative commitment was not significant ($\Delta R^2 = .03$, $p > .05$).

Step three of the hierarchical regression was used to determine the increase in explained variance attributable to the content variables. This analysis indicated that the addition of the content variables significantly increased the explained variance in affective commitment ($\Delta R^2 = .31$, $p < .01$). The increases for pessimism ($\Delta R^2 = .07$, $p > .05$), continuance commitment ($\Delta R^2 = .11$, $p > .05$), and normative commitment ($\Delta R^2 = .10$, $p > .05$) were not significant. The last step in the hierarchical regression was to insert the process variables.

The results of step four indicated that the process variables significantly increased the explained variance for continuance commitment ($\Delta R^2 = .10$, $p < .01$). The increase in explained variance for pessimism and normative commitment was insignificant and there was no increase in explained variance for affective commitment attributable to the addition of the process variables.

*Mediated Regression*

The final analytical procedure was to conduct a mediated regression in order to determine whether or not the readiness variables mediated the relationship between the four sets of predictor variables and the attitudinal outcome variables (see Figure 1). Following a process employed by Ferres, Travaglione, and Connell (2002), the individual, context, content, and process variables were independent variables and

regressed against each of the attitudinal outcome variables. Next, the antecedent variables (i.e. individual) and the readiness variables were regressed against the attitudinal outcome variables simultaneously. If the readiness variables were indeed acting as a mediator, the influence of the antecedents on the attitudinal outcome variables would decrease significantly as the readiness variables were added.

*Results*. The results of the mediated regression are shown in Table 8 and Table 9. Table 8 presents the regression of the individual, context, content, and process variables on the attitudinal outcome variables. Table 9 presents the simultaneous regression of the antecedent variables and the readiness variables on the attitudinal outcome variables. Although there was noticeable movement (both positive and negative) in the standardized beta coefficients for nearly all of the antecedent variables when the readiness variables were added, the results indicated partial mediation at best.

Concerning job satisfaction, principal support decreased slightly and was reduced to insignificant when the readiness variables were added. In regards to change anxiety, negative affect was reduced from significant at $p < .01$ to $p < .05$, perceived organizational support was increased in significance from $p < .05$ to $p < .01$, and valence was reduced to insignificant. There were no changes in the significance levels of the standardized betas for turnover intentions as a result of adding the readiness variables. The only readiness variable that was a significant predictor for the attitudinal outcomes was continuance commitment, which was significant for job satisfaction ($r = .26$, $p < .05$), change anxiety ($r = -.28$, $p < .05$) and turnover intentions ($r = -.39$, $p < .05$).

Concerning the amount of explained variance between the antecedents model and the model with the antecedents and readiness variables combined, the $R^2$ increased for all

Table 10

*Regression of Antecedent Variables*

| Variable | Job Satisfaction (Standardized β) | Change Anxiety (Standardized β) | Turnover Intentions (Standardized β) |
|---|---|---|---|
| Individual | | | |
| Positive affect | .17 | .15 | -.06 |
| Negative affect | -.06 | -.31** | -.00 |
| Efficacy | -.13 | .38** | -.02 |
| Innovativeness | -.02 | -.09 | -.10 |
| Context | | | |
| Perceived organizational support | .68** | -.26* | -.48** |
| Principal support | .29* | -.18 | -.31 |
| Content | | | |
| Appropriateness | .03 | -.09 | .12 |
| Valence | .14 | .23* | -.08 |
| Change evaluation | -.09 | .00 | -.03 |
| Process | | | |
| Management support | -.17 | .02 | -.03 |
| Participation | -.07 | .21 | .17 |
| Communication climate | -.06 | .34** | -.08 |
| Quality of information | -.03 | -.12 | .17 |
| $R^2$ | .60 | .63 | .35 |
| F-ratio | 9.03** | 9.99** | 3.23** |

*p < .05, **p < .01

Table 11

*Simultaneous Regression of Antecedent and Readiness Variables*

| Variable | Job Satisfaction (Standardized β) | Change Anxiety (Standardized β) | Turnover Intentions (Standardized β) |
|---|---|---|---|
| Individual | | | |
| Positive affect | .10 | .21 | .06 |
| Negative affect | -.11 | -.21* | .13 |
| Efficacy | -.12 | .37** | -.04 |
| Innovativeness | -.04 | -.04 | -.02 |
| Context | | | |
| Perceived organizational support | .74** | -.38** | -.60** |
| Principal support | .28 | -.11 | -.27 |
| Content | | | |
| Appropriateness | -.09 | -.08 | .37 |
| Valence | .18 | .19 | -.15 |
| Change evaluation | -.07 | -.04 | -.06 |
| Process | | | |
| Management support | -.21 | .04 | .01 |
| Participation | .02 | .08 | .03 |
| Communication climate | -.13 | .41** | .03 |
| Quality of information | .05 | -.16 | .06 |
| Readiness | | | |
| Pessimism | -.08 | .03 | .08 |
| Affective Commitment | .09 | .08 | -.13 |
| Continuance Commitment | .26* | -.28* | -.39* |
| Normative Commitment | -.08 | -.04 | -.01 |
| $R^2$ | .63 | .67 | .43 |
| F-ratio | 7.17** | 8.50** | 3.16** |

*p < .05, **p < .01

three attitudinal outcome variables when the readiness variables were added ($\Delta R^2$ = .03 for job satisfaction; $\Delta R^2$ = .04 for change anxiety; and $\Delta R^2$ = .08 for turnover intentions). However, based on a full vs. reduced F-test, none of the increases in $R^2$ were significant at $p < .05$, again indicating only partial mediation.

*Summary*

Considering the analysis as a whole, these results demonstrated evidence that the individual, context, content, and process variables used in this research all contributed to the assessment and prediction of an organization's readiness. The hierarchical regression highlighted several salient relationships concerning the explanatory power that each antecedent variable had with each respective readiness variable. Finally, although it was anticipated that the antecedent variables would play a stronger mediation role between the antecedent variables and the attitudinal outcome variables, there was still a noticeable mediation involved. The next section will address the overall results and implications of this study, its limitations, and potential areas of future research.

## IV. Discussion

### *Conclusion*

The primary objective of this research was to use the existing readiness instruments to assemble a comprehensive readiness for change instrument that simultaneously measured the individual, context, content, and process aspects of readiness. While previous research over the last several decades has collectively demonstrated the significance of measuring all four aspects of readiness, there is a noticeable absence in past research in regards to validly and reliably tapping the perspectives simultaneously. In all, 30 instruments were compared and contrasted in this research via facet analysis. Three of the instruments were classified as *content* instruments, three were classified as *process* instruments, eleven were classified as *context* instruments, and thirteen were classified as *individual* instruments. The facet analysis highlighted significant weaknesses in the instruments regarding their psychometric properties, their ability to be applied in a variety of disciplines, and the lack of significant follow-up research. Thus, only four of the instruments were utilized while other more proven variables were integrated into the comprehensive readiness measurement instrument. A primary premise of this research was that the application of a comprehensive readiness for change instrument could serve as a conduit for organizational managers and change agents to increase the likelihood of a successful change implementation.

To test the comprehensive instrument, it was administered to the Aeronautical Systems Command's Contracting Directorate (ASC/PK), a Department of Defense organization. The mean scores revealed significant information to the ASC/PK senior

leadership. In general, the participants approved the implementation of KM initiatives, felt that the KM initiatives were appropriate for ASC/PK to meet its goals, that they will personally benefit from KM initiatives, and that they want to do what they can to help the initiatives succeed. The bi-variate relationships, which demonstrate the strength and direction of the linear relationships between each of the study variables, exhibited moderate to very strong relationships. In addition, all of the statistically significant relationships were in the expected direction.

Hierarchical regression was used to explore the incremental variance explained by the study variables on the readiness variables. It was anticipated that the individual and contextual variables would explain the greatest amount of variance in the readiness variables due to the fact that they are more tightly woven into the fabric of the organization. While this held true for pessimism, the content variables were equivalently influential as the context variables for continuance commitment and more influential than the context variables for affirmative and normative commitment. The process variables exhibited very little influence over the readiness variables, which mirrored the neutral position expressed by the participants in the mean scores of the process variables.

Finally, mediated regression was used to test the extent to which the readiness variables of the comprehensive model moderated the relationship between the four main research variables and the attitudinal outcome variables. While full mediation was anticipated, the results revealed partial mediation at best. To support full mediation, the readiness variables should not predict the attitudinal outcome variables any better when the antecedent variables are added. In fact, as shown in Table 8 and Table 9, the

addition of the antecedent variables increased the explanatory power of all three attitudinal outcome variables although the increases were not statistically significant.

The results demonstrated that the comprehensive model provides a practical, flexible, and consistent readiness measurement instrument. The comprehensive instrument is practical in the sense that it can guide change agents and organizational managers by gauging a wide variety of the most influential readiness factors. By establishing contextual connotation to the mean scores and bi-variate relationships, the Director of ASC/PK was able to "place his finger on the pulse of the organization" regarding the KM initiatives. Among other sentiments, Mr. Ross was able to determine that participants, in general, favor the KM initiatives, feel they are appropriate, feel they will benefit from the initiatives, and feel that the organization is supporting them during the changes. In addition, Mr. Ross commented that information gleaned from the research would very likely play a significant role in the implementation of future KM change initiatives.

The comprehensive instrument is flexible in the sense that it can be effectively applied in a variety of organizational settings and at different organizational levels. Illustrated in the literature review was the manner in which many instruments restrict their widespread use due to the content and structure of their respective questionnaire items. The items assembled for the comprehensive instrument utilized in this research are of a general nature and can be easily adapted for use in a wide spectrum of research and field settings.

Finally, by utilizing proven items that are statistically reliable and valid, the comprehensive instrument is consistent with current organizational change theories and

adheres to American Psychological Association (APA) measurement standards. This allows organizational managers to express confidence in the results and make informed decisions regarding change implementation.

*Limitations*

Clearly, there are limitations to this research. First and foremost, there is a need for additional tests and refinement of the research variables used to measure readiness. Specifically, the three items used to measure discrepancy failed to measure that particular variable as a one-dimensional latent construct. A visual scan of the response data failed to detect any discernable patterns. For example, many respondents felt there was a need for change but that ASC/PK did not have a clear vision to get them there. Others felt that organizational leaders did have a clear vision and that there was no need to change their business activities. The result was almost no inter-correlation among the three items used to measure discrepancy.

Another possible limitation of the present research is the general ambiguity surrounding the term "Knowledge Management". Because KM encompasses a large number of change initiatives designed to increase the efficiency and effectiveness of an organization by leveraging the shared knowledge of its members, the term may be too general to provide an accurate assessment of the participant's readiness. This would tend to limit the value of the information to organizational leaders if participants are allowed to vary their concept of the change initiative as they respond.

Finally, as with all research information garnered via questionnaire items, there is the risk of common method bias. Because this research aggressively tapped 21 variables, there is a possibility that bias could have been introduced into participants' responses by

predecessor items. In addition, since all members of ASC/PK were given the opportunity to participate in the survey, there is the potential for self-selection bias. Although a seven-point Likert type scale was used extensively throughout the questionnaire (except for positive and negative affect), the questionnaire items were randomly mixed to minimize the effects of single method variance.

*Future research*

Part and parcel with the research limitations are the implications for future research. First, there is a clear need to fine tune the variables used in this research and re-test the comprehensive instrument on a more clearly defined change initiative to solidify the results. As previously mentioned, the term Knowledge Management serves as an umbrella for a wide range of initiatives. Another improvement that can be made in future studies is to ensure the attitudinal outcomes selected are appropriate for the study. This research can not be certain that job satisfaction, change anxiety, and turnover intentions are the most appropriate attitudinal outcome variables to measure concerning KM initiatives within a DoD organization. They were selected for this research due to their widespread use throughout the literature, but in fact, need to be carefully selected based on how applicable they are to the change initiative.

Finally, as the issues surrounding the discrepancy items proved, there is a need for future research to continue to improve on item development that currently adheres to "minimum" APA standards for measurement. The fact that the three discrepancy items failed to measure that variable as a one-dimensional construct should not trivialize the importance of measuring discrepancy as a readiness variable. Instead, those three items and the items for variables hovering around the generally accepted reliability threshold of

.70 can use further refinement to push them to the upper limit of reliability increasing their value to researchers and practitioners alike.

### *Summary*

In summary, the fact that a majority of large-scale change initiatives fail to achieve the substantial organizational improvements that were intended has forced more organizational managers and change agents to gauge an organization's *readiness* prior to implementation in an attempt to improve the likelihood of a successful implementation. Unfortunately, there currently isn't a "standard" instrument that is malleable to various disciplines and organizational settings. This research successfully established and tested a comprehensive model of readiness for change measurement instrument that simultaneously taps the individual, contextual, content, and process perspectives of readiness while generally adhering to APA standards for such instruments. Thus, as indicated by the limitations and potential areas of future research, the results of the current research have paved the way for further readiness research to refine an "ideal" comprehensive readiness measurement instrument.

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## Vita

Captain Steven W. Clark graduated from Hutsonville High School in Hutsonville, IL in 1987. While serving as an enlisted member of the Air Force in the military intelligence career field, he attended the University of Maryland as an undergraduate student and graduated with a Bachelor of Science degree in Finance in May 1996. He was selected for Officer Training School in 1998 and was commissioned in 1999.

Capt Clark's first assignment was at Headquarters, Air Force Office of Special Investigations, Andrews AFB, MD. There he served as a junior budget officer and financial manager for a variety of programs. In addition, Capt Clark was responsible for Financial Plan submissions, Program Objective Memorandum submissions, and fiscal end-of-year closeout. In August 2001, he entered the School of Engineering and Management, Air Force Institute of Technology as a Cost Analysis student. Upon graduation, Capt Clark will be assigned to the Electronic Security Command's Joint Stars Program Office at Hanscom AFB, MA.

# Appendix A

## Readiness for Change Questionnaire

**Purpose**: Our research team is investigating readiness for implementation of initiatives to improve knowledge sharing. Our goal is to more fully understand ASC/PK's readiness for this type of change and give leaders information that will help them understand your concerns.

**Confidentiality**: We would greatly appreciate your completing this survey. Your input is important for us to completely understand this change. **ALL ANSWERS ARE STRICTLY CONFIDENTIAL**. No one outside the research team will ever see your questionnaire. Findings will be reported at the group level only. We ask for some demographic and unit information in order to interpret results more accurately, and in order to link responses for an entire unit. Reports summarizing trends in large groups may be published. There may be a follow-up questionnaire at a later date to make comparisons over time. In order to facilitate such comparisons, an 8-digit, anonymous code will be developed for each respondent. To create your code, please fill in the information requested below.

| Last two letters of your last name (Print) | Last two numbers of your Social Security # | Last two letters of your mother's maiden name | Month of your birth (two digits – i.e. "01" for January) |
|---|---|---|---|
| | | | |

**Contact information**: If you have any questions or comments about the survey contact Steven Clark at the fax, mailing address, or e-mail address listed below.

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IINSTRUCTIONS

- Base your answers on your own feelings and experiences
- Read directions carefully and mark only one answer for each question
- If completing a paper version , please write clearly making dark marks (feel free to use a blue or black ink pen that does not soak through the paper)
- Avoid stray marks and if you make corrections erase marks completely

**MARKING EXAMPLES**

Right ● Wrong ⊗ ⊘ ⊙

**PART I**
**ATTITUDES**
**TOWARD KNOWLEDGE**
**SHARING**

**We would like to understand how you feel about the implementation of initiatives to improve knowledge sharing within your organization. The following questions will help us do that. Unless specifically told otherwise, the terms, "organization" refers to the ASC/PK buying community (including staff and support) and "top management" refers to the ASC/PK executive staff (e.g., PK front office). Also, knowledge sharing initiatives are projects that make it easier and/or faster to share knowledge throughout the organization. Hypothetically speaking, such initiatives might include the following:**

1) **Web-based "yellow pages" that list points of contact throughout PK for various topics;**
2) **Computer software and hardware that allows multiple individuals (regardless of geographic location) to collaborate real-time (i.e. web cams and video conferencing capability at each desktop);**
3) **Extensive digital knowledge libraries that capture best practices in written, audio, and video formats (i.e. web-accessible video interviews with retiring personnel who have extensive experience in certain processes);**
4) **Monetary award incentives for sharing knowledge with others; and/or**
5) **Job performance standards based on knowledge sharing.**

**Such initiatives may be mandated by management levels above ASC/PK and may be implemented over multiple organizations besides just ASC/PK.**

**The following scale consists of a number of paired words that measure the meaning of the changes to you personally. Please read each pair of words and indicate your general feelings toward such knowledge sharing changes as they pertain to that particular pair of words. The scale is a spectrum with the middle being neutral and your feelings getting stronger as you move farther out toward each word. Use the following scale to indicate your answers.**

| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
|---|---|---|---|---|---|---|
| Extremely | Moderately | A little | Neutral | A little | Moderately | Extremely |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Good | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | Bad |
| Progressive | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | Regressive |
| Foolish | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | Wise |
| Ineffective | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | Effective |
| Worthless | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | Valuable |
| Positive | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | Negative |

**Answer each of the following statements by filling in the circle for the number that indicates the extent to which you agree that the statement is true.**

| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
|---|---|---|---|---|---|---|
| **Strongly Disagree** | **Disagree** | **Slightly Disagree** | **Neither Agree or Disagree** | **Slightly Agree** | **Agree** | **Strongly Agree** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1. | The manager of my unit is committed to making such knowledge sharing change efforts a success. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 2. | I have no choice but to go along with such changes. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 3. | Such knowledge sharing changes make it easier for me to feel like I'm part of the "team." | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 4. | I think we are spending a lot of time on such changes when the senior managers don't even want them implemented. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 5. | I believe in the value of such knowledge sharing changes. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 6. | The time we would spend on such changes should be spent on something else. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 7. | Things would be better without such knowledge sharing changes. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 8. | I think that the organization will benefit from changes that improve knowledge sharing. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 9. | My past experiences make me confident that I will be able to perform successfully after such changes are made. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 10. | Our organization's top decision-makers have put all their support behind such change efforts. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 11. | Implementation of knowledge sharing changes will disrupt many of the personal relationships I have developed. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 12. | In the long run, I feel it will be worthwhile for me if the organization adopts changes that will improve knowledge sharing. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 13. | Such changes give me the ability to make decisions about how my work is done. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 14. | Resisting such knowledge sharing changes is not a viable option for me. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 15. | I have too much at stake to resist such changes. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 16. | Changes that improve knowledge sharing will make my job easier. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 17. | The information I received about such changes helped me understand the changes. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |

| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
|---|---|---|---|---|---|---|
| **Strongly Disagree** | **Disagree** | **Slightly Disagree** | **Neither Agree or Disagree** | **Slightly Agree** | **Agree** | **Strongly Agree** |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 18. | I feel anxious about the implementation of such knowledge sharing changes. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 19. | I am worried I will lose some of my status in the organization when such changes are implemented. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 20. | I would feel guilty about opposing such knowledge sharing changes. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 21. | The information I received about such changes has adequately answered my questions. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 22. | Attempts to make things better around here will not produce good results. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 23. | Every senior manager has stressed the importance of changes that will improve knowledge sharing. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 24. | When we implement such knowledge sharing changes, I feel I can handle it with ease. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 25. | After such changes, I expect to be recognized more for the work I do. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 26. | Changes that improve knowledge sharing will improve our organization's overall efficiency. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 27. | I have some control over the knowledge sharing changes that will be proposed. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 28. | My peers have supported such a knowledge sharing change effort. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 29. | I am able to ask questions about this change. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 30. | I feel a sense of duty to work toward such changes. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 31. | I feel pressure to go along with such changes. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 32. | I think that management is making a mistake by introducing such changes. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 33. | It would be risky to speak out against such changes. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 34. | Our senior leaders have encouraged all of us to embrace changes that will improve knowledge sharing. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 35. | Changes that will improve knowledge sharing match the priorities of our organization. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 36. | Management has sent a clear signal that this organization is going to make changes that will improve knowledge sharing. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |

| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
|---|---|---|---|---|---|---|
| **Strongly Disagree** | **Disagree** | **Slightly Disagree** | **Neither Agree or Disagree** | **Slightly Agree** | **Agree** | **Strongly Agree** |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 37. | There are legitimate reasons for us to make changes that will improve knowledge sharing. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 38. | This organization's most senior leader is committed to such change. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 39. | I do not think it would be right of me to oppose such knowledge sharing changes. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 40. | Such knowledge sharing changes serve an important purpose. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 41. | When I set my mind to it, I can learn everything that will be required when such changes are adopted. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 42. | Such changes are not necessary. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 43. | There are some tasks that will be required when we change I don't think I can do well. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 44. | I have the skills that are needed to make such knowledge sharing changes work. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 45. | It would be too costly for me to resist such changes. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 46. | Such knowledge sharing changes are a good strategy for this organization. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 47. | There are a number of rational reasons for such changes to be made. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 48. | I do not anticipate any problems adjusting to the work I will have when such knowledge sharing changes are adopted. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 49. | It doesn't make much sense for us to initiate changes that will improve knowledge sharing. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 50. | My future in this job will be limited because of such changes. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 51. | The information I received about such knowledge sharing changes was timely. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 52. | The thought of such changes worries me. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 53. | I would not feel badly about opposing such changes. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 54. | When changes that improve knowledge sharing are implemented, I don't believe there is anything for me to gain. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 55. | I am able to participate in the implementation of such changes. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 56. | Right now, I am somewhat resistant to such knowledge sharing changes. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 57. | It would be irresponsible of me to resist such changes. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |

| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
|---|---|---|---|---|---|---|
| **Strongly Disagree** | **Disagree** | **Slightly Disagree** | **Neither Agree or Disagree** | **Slightly Agree** | **Agree** | **Strongly Agree** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 58. | I do not feel any obligation to support such changes. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |

**PART II**
**ATTITUDES TOWARD ASC/PK AND YOUR JOB**

**We would like to understand how you generally feel about ASC/PK and your job. The following questions will help us do that. You should answer each statement by filling in the circle for the number that indicates the extent to which you agree that the statement is true.**

| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
|---|---|---|---|---|---|---|
| **Strongly Disagree** | **Disagree** | **Slightly Disagree** | **Neither Agree or Disagree** | **Slightly Agree** | **Agree** | **Strongly Agree** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 59. | Most of the programs that are supposed to solve problems around here will not do much good. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 60. | I am seriously thinking about quitting my job. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 61. | Plans for future improvement will not amount to much. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 62. | In general, I like working here. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 63. | If I want to, I can have input into the decisions being made about our future programs. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 64. | The organization is willing to extend itself in order to help me perform my job to the best of my ability. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 65. | All in all, I am satisfied with my job. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 66. | There is a clear need for ASC/PK to change our business activities. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 67. | Suggestions on how to solve problems will not produce much real change. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 68. | Even if I did the best job possible, the organization would fail to notice me. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 69. | In general, I don't like my job. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |

| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
|---|---|---|---|---|---|---|
| **Strongly Disagree** | **Disagree** | **Slightly Disagree** | **Neither Agree or Disagree** | **Slightly Agree** | **Agree** | **Strongly Agree** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 70. | As soon as I can find a better job, I'll leave ASC/PK. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 71. | The organization takes pride in my accomplishments. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 72. | The people who know what's going on within ASC/PK do not share information with me. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 73. | I feel like no one ever tells me anything about what's going on around here. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 74. | The organization really cares about my well-being. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 75. | I am actively looking for a job outside of ASC/PK. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 76. | The organization cares about my general satisfaction at work. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 77. | I often think about quitting my job at ASC/PK. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 78. | My performance would improve if I received more information about what's going on in ASC/PK. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 79. | There is a clear vision guiding ASC/PK. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 80. | The organization shows very little concern for me. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 81. | I am thoroughly satisfied with the information I receive about what's going on within the ASC/PK community. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 82. | Our organization has problems that need to be addressed. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |

## PART III
## ATTITUDES ABOUT YOURSELF

**We would like to understand how you feel about change in general. The following questions will help us do that. You should answer each statement by filling in the circle for the number that indicates the extent to which you agree that the statement is true.**

| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
|---|---|---|---|---|---|---|
| **Strongly Disagree** | **Disagree** | **Slightly Disagree** | **Neither Agree or Disagree** | **Slightly Agree** | **Agree** | **Strongly Agree** |

| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
|---|---|---|---|---|---|---|
| **Strongly Disagree** | **Disagree** | **Slightly Disagree** | **Neither Agree or Disagree** | **Slightly Agree** | **Agree** | **Strongly Agree** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 83. | I am reluctant about adopting new ways of doing things until I see them working for people around me. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 84. | I often find myself skeptical of new ideas. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 85. | I rarely trust new ideas until I can see whether the vast majority of people around me accept them. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 86. | I am challenged by ambiguities and unsolved problems. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 87. | I tend to feel that the old way of living and doing things is the best way. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 88. | I am generally cautious about accepting new ideas. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 89. | I must see other people using new innovations before I will consider them. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 90. | I am aware that I am usually one of the last people in my group to accept something new. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |

**The following scale consists of a number of words that describe different feelings and emotions. Please read each item and then fill in the circle that best reflects the way you generally feel, that is, how you feel on average concerning changes. Use the following scale to indicate your answers.**

| ① | ② | ③ | ④ | ⑤ |
|---|---|---|---|---|
| Very slightly Or not at all | A little | Moderately | Quite a bit | Extremely |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Interested | ① | ② | ③ | ④ | ⑤ | Irritable | ① | ② | ③ | ④ | ⑤ |
| Distressed | ① | ② | ③ | ④ | ⑤ | Alert | ① | ② | ③ | ④ | ⑤ |
| Excited | ① | ② | ③ | ④ | ⑤ | Ashamed | ① | ② | ③ | ④ | ⑤ |
| Upset | ① | ② | ③ | ④ | ⑤ | Inspired | ① | ② | ③ | ④ | ⑤ |
| Strong | ① | ② | ③ | ④ | ⑤ | Nervous | ① | ② | ③ | ④ | ⑤ |
| Guilty | ① | ② | ③ | ④ | ⑤ | Determined | ① | ② | ③ | ④ | ⑤ |
| Scared | ① | ② | ③ | ④ | ⑤ | Attentive | ① | ② | ③ | ④ | ⑤ |
| Hostile | ① | ② | ③ | ④ | ⑤ | Jittery | ① | ② | ③ | ④ | ⑤ |
| Enthusiastic | ① | ② | ③ | ④ | ⑤ | Active | ① | ② | ③ | ④ | ⑤ |
| Proud | ① | ② | ③ | ④ | ⑤ | Afraid | ① | ② | ③ | ④ | ⑤ |

## PART IV
## BACKGROUND
## INFORMATION

This final section contains items regarding your personal characteristics. These items are very important for statistical purposes. Respond to each item by WRITING IN THE INFORMATION requested or CHECKING THE BOX ☑ that best describes you.

1. Describe your primary career field or profession (e.g., buyer, contracting officer, pricer, clerk, staff, etc.)? _____

2. Are you a supervisor? □ **Yes (How many people do you supervise? _____)**
   □ **No**

3. How many levels of management separate you from ASC/PK's Director?
   ____

4. How long have you worked for ASC/PK? _____ years _____ months

5. How long have you been in your current ASC/PK job? _____ years _____ months

6. Please indicate the highest level of education that you have attained.

   □ **Some High School**
   □ **High School Diploma**
   □ **Associate's degree**
   □ **Bachelor's degree**
   □ **Master's degree**
   □ **Doctorate degree**
   □ **Other (please specify)**
   _____

7. What is your age? _____ years

8. What is your gender?

   □ **Male** □ **Female**

9. Are you currently civilian or military?

   □ **Civilian - Prior military? (Yes or No) _____**

   □ **Military – Rank _____**

**PLEASE FEEL FREE TO MAKE ANY ADDITIONAL COMMENTS ABOUT KNOWLEDGE SHARING & OTHER CHANGES ON THE BACK OF THESE PAGES**

**Thank you for your participation!**

# REPORT DOCUMENTATION PAGE

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**5d. PROJECT NUMBER**

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**13. SUPPLEMENTARY NOTES**

**14. ABSTRACT**

Organizations are continually forced to implement changes due to a myriad of external and internal influences. Despite the fact that organizations are in a perpetual state of change, research has shown that nearly 75% that have initiated large-scale change efforts have not realized the significant organizational improvements that were intended. Preemptively, organizational managers are being encouraged to gauge their organization's readiness prior to implementing changes. Unfortunately, over 40 unique instruments currently exist that purport to measure some aspect of readiness. Because of limited perspective, no instrument has emerged as the standard and the instruments are often used inappropriately. This study analyzed the existing instruments and integrated those that have empirically demonstrated reliability, utility, and validity into a new synergistic instrument that can be utilized across various research disciplines.

The new comprehensive instrument was then tested on ASC/PK, which is currently implementing several Knowledge Management initiatives designed to increase the efficiency and effectiveness of the organization by leveraging the shared knowledge of its members.

**15. SUBJECT TERMS**

Readiness, Readiness for Change, Readiness Measurement Instruments, Facet Analysis, Comprehensive Model, Perspectives, Variables, Individual, Process, Content, Context, Attitudinal Outcome, Descriptive Statistics, Hierarchical Regression, Mediated Regression, Knowledge Management

| 16. SECURITY CLASSIFICATION OF: | | | 17. LIMITATION OF ABSTRACT | 18. NUMBER OF PAGES | 19a. NAME OF RESPONSIBLE PERSON |
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| a. REPORT | b. ABSTRACT | c. THIS PAGE | | | Daniel T. Holt, Maj, USAF (ENV) |
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