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Corporate Entrepreneurship Assessment Instrument (CEAI): Systematic Validation of a Measure

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CORPORATE ENTREPRENEURSHIP ASSESSMENT INSTRUMENT (CEAI): SYSTEMATIC VALIDATION OF A MEASURE

THESIS

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Abstract

The implementation of corporate entrepreneurship is becoming an important activity for private- and public-sector organizations. Organizational factors have been linked to successful corporate entrepreneurship. The Corporate Entrepreneurship Assessment Instrument (CEAI) is an instrument that attempts to measure the effectiveness of the key internal organizational factors, or climate, that influence innovative activities and behaviors. This study attempted to assess the content validity and factor structure of the CEAI and thus add weight to the psychometric soundness of the instrument. In sum, the effectiveness of the instrument was tested using the framework for scale development presented by Hinkin (1998). Overall, the CEAI was found to be a relatively stable instrument. In fact, the factor structure that emerged only slightly varied from the original instrument developed by Hornsby, Kuratko, and Zahra (2002).

To my family

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CORPORATE ENTREPRENEURIAL ASSESSMENT INSTRUMENT (CEAI): SYSTEMATIC VALIDATION OF A MEASURE

I. Introduction

One of the things that is really important for government is to make sure that the environment is such that the entrepreneurial spirit remains strong.
President George W. Bush (2005)

The diffusion of an entrepreneurial mindset and behaviors through the corporate structure has become an increasingly important concept to private- and public-sector organizations that are trying to remain competitive and efficient in the rapidly changing global marketplace (Kuratko, Montagno, & Hornsby, 1990). Researchers have suggested that this corporate entrepreneurship, also referred to as intrapreneurship, goes on inside any existing organization, regardless of its size, and leads to innovative activities, including new product development, process improvement, and service improvement (Antoncic & Hisrich, 2001). At an individual-level, this revolves around the encouragement and demonstration of innovativeness, pro-activeness, and risk taking among the members within a larger organizational context (Covin & Slevin, 1989).

Through these activities and the internally generated innovations that are derived from them, corporate entrepreneurship can bolster the organization's overall performance and lead to considerable competitive advantage (Antoncic & Hisrich, 2001). Kuratko, Ireland, and Hornsby (2001) found that corporate entrepreneurship activities in a large firm resulted in

diversified products and markets, as well as being instrumental to producing "impressive financial results"(p. 69). Several quantitative studies have further supported this claim (e.g. Zahra & Covin, 1995), linking corporate entrepreneurship to increased growth, increased profitability, or both (Covin & Slevin, 1989). Moreover, others have found that corporate entrepreneurship is positively linked to intangible outcomes, like knowledge and skill development (e.g., Ireland, Kuratko, & Covin, 2003; Schildt, Maula, & Keil, 2005). Furthermore, Brizek (2003) found that job satisfaction was positively related to an organization's internal entrepreneurial environment. In short, research has repeatedly shown that tangible (i.e., financial gain) and intangible (i.e., knowledge) assets can be increased through corporate entrepreneurship activities.

Accordingly, researchers have sought to identify the factors that encourage corporate entrepreneurship within an organization (Zahra, Jennings, & Kuratko, 1999). Zahra (1986) identified three general categories of corporate entrepreneurship antecedents, namely, environmental, strategic, and organizational factors. Environmental factors are those characteristics external to the organization such as dynamism, industry growth, customer demands, and external technological development that influence corporate entrepreneurship behaviors and activities. Strategic factors represent the enterprise's overall competitive orientation where firms tend to have growth (internally or externally), stability, or retrenchment strategies. Corporate entrepreneurship, in turn, is a function of these strategies (Ettlie, 1983). Finally, organizational factors represent characteristics that are internal to the organization including an organization's structure, culture, and managerial support systems (Hornsby, Kuratko, & Zahra, 2002).

Antoncic and Hisrich (2004) extended this stream of research to identify the external environment and organizational factors that influence the extent to which corporate entrepreneurship flourishes in organizations. While they suggested several external environmental conditions that influence an organization's willingness to participate in corporate entrepreneurship activities (e.g., industry market, demand for products), they argued that internal organizational factors are of particular importance because they can be directly influenced by managers and leaders. In addition to Antoncic and Hisrich's (2004) thoughts, organizational factors are more proximal to the individual, and the essence of corporate entrepreneurship revolves around the innovative activities of the individual. Finally, leaders and researchers can develop measures of these factors and use the data that are gathered to focus their efforts to encourage corporate entrepreneurship within their organizations.

While several corporate entrepreneurship measures exist (e.g. Covin & Slevin, 1989; Knight, 1997; Zahra, 1993), there is little agreement on which internal organizational factors are essential to stimulating corporate entrepreneurship activities. Recently, Hornsby et al. (2002) attempted to identify the key internal organizational factors that influence corporate entrepreneurship by analyzing the large body of corporate entrepreneurship literature. Hornsby et al. synthesized the literature and suggested that the findings directed toward identifying the organizational factors that influence corporate entrepreneurship converge on five internal conditions. These included: management support, work discretion and autonomy, rewards and reinforcement, time availability, and organizational boundaries. From this, Hornsby et al. presented the Corporate Entrepreneurship Assessment Instrument (CEAI)—a survey instrument designed to help managers and leaders measure each of these

internal environmental factors. The CEAI is promising for several reasons. First, the CEAI measures antecedents in a way that provides those that use it with a guide to improve corporate entrepreneurship activities. Second, the CEAI measures entrepreneurship at the individual level. As noted, this is important because corporate entrepreneurship requires individual innovative behaviors. Third, the CEAI is relatively brief, which may encourage more managers and leaders to use it.

While Hornsby et al. (2002) offered some initial evidence of the instrument's reliability and validity; they suggest that further tests of reliability and validity are required. With this in mind, this study will evaluate the psychometric properties of the CEAI further and refine the instrument as needed. To do this, two analyses will be conducted using Hinkin's (1998) framework for developing measures. First, the content validity of the instrument's items will be tested empirically. Second, an exploratory factor analysis will be conducted to investigate the existence of the five factors. The goal of this method is to further bolster the evidence that exists regarding the psychometric properties, giving researchers and practitioners assurances that the instrument assesses the organization's entrepreneurial environment.

Before the method and results are discussed, the concept of corporate entrepreneurship will be defined. This will be followed by a discussion of the antecedents that have been identified in the literature. Finally, a list of Corporate Entrepreneurship measures will be presented and discussed. Ultimately, the following literature review will demonstrate why this study is worthwhile for both theoretical and practical reasons.

Corporate Entrepreneurship

As noted, a body of literature has emerged that encourages leaders to promote innovativeness, pro-activeness, and risk taking among the members within a larger organizational context (Covin & Slevin, 1989). As this literature has emerged, various concepts, constructs, and definitions used to describe these activities have been introduced and analyzed. Corporate entrepreneurship, corporate venturing, intrapreneurship, and entrepreneurial mindset are all examples of terms that have formed the basis of research describing these activities (Covin & Slevin, 1991; Kuratko, Hornsby, Naffziger, & Montagno, 1993; Kuratko, et al., 2001). In many cases, however, the differences between these concepts are ambiguous or unspecified, continuing to thwart attempts to clearly define these particular types of innovative organizational activities. A readily apparent example of this ambiguity is the different terminology used by the different authors (e.g. Hornsby et al. (2002) refer to Corporate Entrepreneurship interchangeably with Intrapreneurship). While it is not the purpose of this study to resolve these differences, it is important to clarify that this study draws on the literature that has explored the corporate entrepreneurship, recognizing that other concepts discussed in the literature may overlap with this concept.

In a global sense, Kuratko, Ireland, Covin, and Hornsby (2005) suggest that corporate entrepreneurship represents a set of behaviors "requiring organizational sanctions and resource commitments for the purpose of developing different types of value-creating innovations" (p. 700). Kuratko et al. (2005) compiled this definition by synthesizing definitions presented by various authors. Table 1 presents an independent summary of the different dimensions presented by the literature reviewed for this study. It is important to recognize that there is considerable ambiguity regarding the specific behaviors and activities

that reflect corporate entrepreneurship. As shown by Table 1, most authors view Corporate Entrepreneurship as a multidimensional construct, but do not agree on what dimensions compose Corporate Entrepreneurship. However, it is important to notice that many of the definitions focus on innovativeness, pro-activeness, and risk taking.

Regardless of the way the construct is conceptualized, Corporate Entrepreneurship involves enabling and promoting workers' abilities to innovatively create value within the organization. In fact, research has shown that a positive relationship exists between corporate entrepreneurship activities and tangible and intangible outcomes (Antoncic and Hisrich, 2001; Covin & Slevin, 1989; Ireland et al., 2003; Kuratko et al., 2001). Based on this idea, researchers have been actively trying to identify the antecedents (i.e. organizational conditions) that promote and diffuse corporate entrepreneurship activities.

Table 1: Corporate Entrepreneurship Definitions

Source(s)	*Definition Dimensions*
Zahra, Neubaum, and Huse (2000) Guth and Ginsberg (1990)	Innovation Activities Venturing Activities Organizational Renewal
Hornsby, Kuratko, and Zahra (2002)	Development of New ideas Implementation of New Ideas
Sathe (1989)	Process of Organizational Renewal
Vesper(1984)	New Strategic Direction Initiative from Below Autonomous Business Creation
Guth and Ginsberg (1990) Covin and Slevin (1989, 1991) Zahra (1991)	Risk taking Innovation Proactiveness
Miller (1983)	Product innovation Proactiveness Risk taking
Kuratko, Ireland, and Hornsby (2001)	Creation Renewal Innovation
Thornberry (2001)	Entrepreneurship turned inward Corporate Venturing Intrapreneuring Organizational transformation Industry Rule-breaking

Antecedents

In the last 30 years, research based on corporate entrepreneurship has sought to identify the dimensions that encourage personnel to participate in innovative activities within an organization. Essentially three general categories of antecedents have been considered: environmental (Antoncic & Hisrich, 2004), strategic (Zahra, 1986), and organizational (Antoncic & Hisrich, 2004).

Environmental antecedents. Environmental antecedents are those that consider the external environment in which the organization exists. The external environment includes: dynamism, technological opportunities, industry growth, and demand for new products (Antoncic & Hisrich, 2001). Dynamism refers to a firms' market environment where a more dynamic environment requires continual renewal to compete (Antoncic & Hisrich, 2004). In recent years, technological advances have been increasing exponentially. Many organizations have responded to rapidly changing technical conditions by adopting an entrepreneurial posture (Antoncic & Hisrich, 2004). Growth markets have also been found to lead to increased corporate entrepreneurship activities (Antoncic & Hisrich, 2004). Finally, demand for new products also encourages corporate entrepreneurship because it forces organizations to consider ways to provide the new products. It has been found that an organization's external environment influences Corporate Entrepreneurship activities within that organization (Antoncic & Hisrich, 2004). Leaders of organizations have little to no control over the environment, but must adapt to rapidly changing conditions to stay competitive. Although important, Zahra (1986) found that the influence of environmental

considerations was less important than that of strategic and organizational variables—these issues are discussed in the subsequent sections.

Strategic antecedents. Strategic policy variables of the organization have been found to predict innovation (Ettlie, 1983). Organizations with various types of strategic posture differ in their commitment to innovation, or corporate entrepreneurship activities. "Strategic posture can be broadly defined as firm's overall competitive orientation" (Covin & Slevin, 1989, p. 77). An organization's strategic posture type, in part, determines the extent to which entrepreneurial behaviors are promoted and accepted (Zahra, 1986). Zahra referenced four strategic posture types: stability, growth (internal and external), and retrenchment. Retrenchment strategies refer to a reduction or withdrawal of an organization from a particular strategic position; where growth refers to an increase or an expansion into a particular strategic action, either internally or externally (Pecotich, Purdie, & Hattie, 2003). The stability strategy involves the maintenance of the organization's status quo business definitions (Pecotich *et al*, 2003).

Zahra (1986) recognized that classification of an organization's strategy is difficult and offers this as an explanation as to why he was unable to prove that organizations with certain strategic types were more conducive to corporate entrepreneurial behaviors and activities, but says his findings should not be equated with a lack of relationship between the two. Instead, Zahra argues the importance of linking innovation to an organization's strategy. Although Zahra's study failed to prove the corporate entrepreneurship-strategy link, his findings did indicate the importance of organizational culture as an antecedent to corporate entrepreneurship activities.

Organizational antecedents. As noted, Antoncic and Hisrich (2004) suggested the most important antecedents are those in the organizational category, because this set of antecedents can be directly influenced by organizational managers and leaders. Internal organizational factors that have been studied include: an organization's incentive and control systems, culture, organizational structure, and managerial support (Hornsby et al., 2002). In general, organizations with innovative climate or culture are expected to be more receptive to corporate entrepreneurship (Antoncic & Hisrich, 2004; Hornsby et al., 2002; Zahra, 1986; Zahra et al., 1999). Additionally, non-hierarchical based organizations are expected to be more receptive to corporate entrepreneurship because individuals have more autonomy which stimulates entrepreneurial behaviors (Hornsby et al., 2002; Quinn, 1985).

While there is little agreement on which internal organizational factors are essential to stimulating corporate entrepreneurship activities, Hornsby et al. (2002) tried to focus these research efforts and identified a set of key internal organizational factors that influence corporate entrepreneurship. Hornsby et al. synthesized the literature and suggested that the findings converged on five internal conditions. These included: management support, work discretion and autonomy, rewards and reinforcement, time availability, and organizational boundaries.

Hornsby et al. (2002) posited that it is expected that the greater the degree the individual perceives the existence of management support, individual's work discretion, rewards, flexible organizational boundaries, and resources to facilitate innovation, the higher the probability of the individual's decision to behave entrepreneurially. Figure 1 depicts the model presented by Hornsby et al. (2002).

In the 2002 study, Hornsby et al. (2002) do not offer formal definitions of the constructs. However, in a later study by Kuratko et al. (2005) the definitions of each of these constructs is presented. M*anagement support* includes "the willingness of top level managers to facilitate and promote entrepreneurial behavior, including the championing of innovative ideas and providing the resources people require to take entrepreneurial actions" (p. 703). The next antecedent, *work discretion*, or *autonomy*, is "top-level managers' commitment to tolerate failure, provide decision-making latitude and freedom from excessive oversight, and to delegate authority and responsibility to middle-level managers" (p. 703). *Rewards (Reinforcement)* concerns "developing and using systems that reward based on performance, highlight significant achievements, and encourage pursuit of challenging work" (p. 703). *Time availability* is about "evaluating workloads to ensure that individuals and groups have the time needed to pursue innovation and that their jobs are structured in ways that support efforts to achieve short- and long-term organizational goals" (p. 703). Finally, *organizational boundaries* is "precise explanations of outcomes expected from organizational work and development of mechanisms for evaluating, selecting, and using innovations" (p. 704).

Based on these ideas, Hornsby et al. (2002) developed the Corporate Entrepreneurship Assessment Instrument —a survey instrument designed to help managers and leaders measure each of these internal environmental factors. Moreover, the focus on internal organizational factors, as noted, are of particular interest because they are, for the most part, under management control (Antoncich &Hisrich, 2001; Antoncic & Hisrich, 2004;

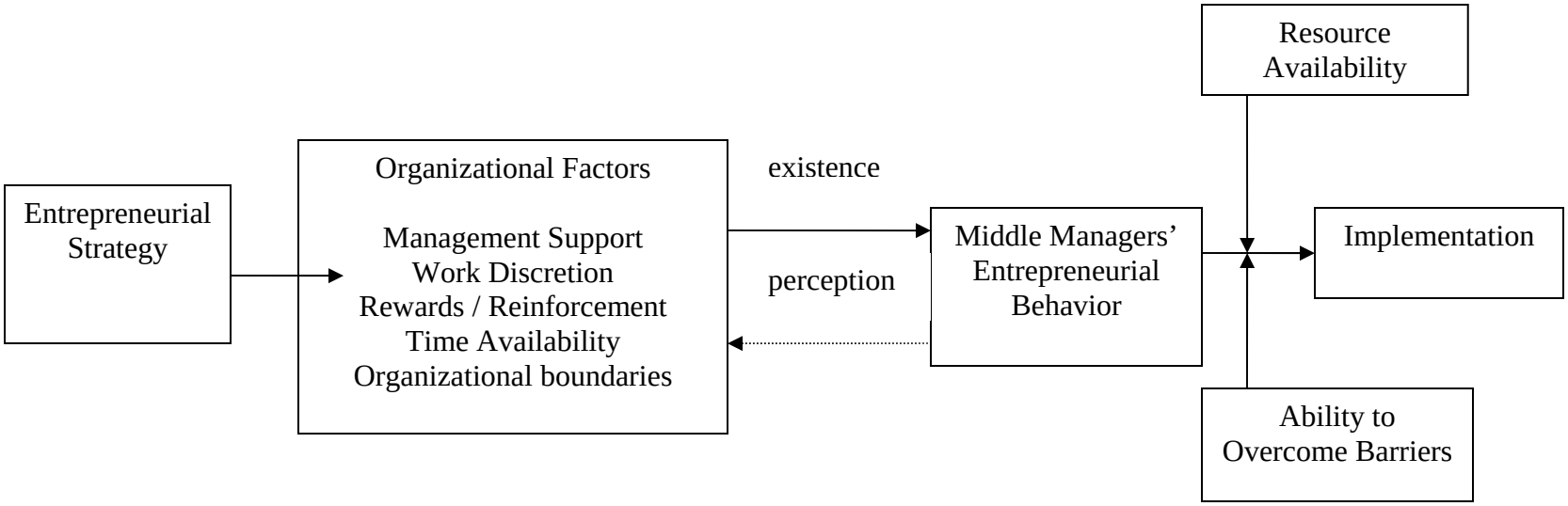

Figure 1: Corporate Entrepreneurship Model Presented by Hornsby et al. (2002)

Kuratko, Ireland, Covin, &Hornsby, 2005; Kuratko, Montagno, & Hornsby, 1990). . Thus, internal organizational factors may have significant practical implications. Measurement of the organizational antecedents intends to help managers and leaders focus their efforts to encourage corporate entrepreneurship activities within their organizations.

Measures

While several corporate entrepreneurship measures exist (e.g. Covin & Slevin, 1989; Knight, 1997; Zahra, 1993), measuring the organizational factors that facilitate corporate entrepreneurship remains a challenge. In an effort to address this, Hornsby et al. (2002) presented the Corporate Entrepreneurship Assessment Instrument (CEAI) which measured the five internal factors that emerged from their synthesis of the entrepreneurship literature. The CEAI has considerable promise for both researchers and practitioners. First, the CEAI was developed using sound psychometric techniques that have been recommended for the organizational sciences (Hinkin, 1998). Second, the CEAI measures antecedents in a way that provides those that use it with a guide to improve corporate entrepreneurship activities. Third, the CEAI measures entrepreneurship at the individual level. As noted, this is important because corporate entrepreneurship requires individual innovative behaviors. Finally, the CEAI is relatively brief, which may encourage more managers and leaders to use it.

Hornsby et al. (2002) offered some initial evidence of the instrument's reliability and validity. Specifically, the instrument measures (a) management support, top management's facilitation of innovation and corporate entrepreneurship; (b) work discretion, freedom for workers to manage work, take risks, and innovate; (c) rewards and reinforcement, alignment of appraisal and reward systems with performance and innovation; (d) time availability, and

(e) organizational boundaries. Hornsby et al. took care to establish an initial level of content validity for the CEAI by conducting a comprehensive review of the corporate entrepreneurship literature. In addition, they administered the instrument to two independent samples to test the factor structure and estimate the internal consistency. Indeed, a five factor model emerged using both exploratory and confirmatory techniques with some initial evidence of each scale's reliability. Specifically, management support was measured with 19 items (coefficient Alpha, $\alpha = .89$); work discretion was measured with nine items ($\alpha = .80$); rewards and reinforcement was measured with six items ($\alpha = .65$); time availability was measured with six items ($\alpha = .92$); and, organizational boundaries was measured with seven items ($\alpha = .58$); which was problematic because of its failure to meet Nunnally's (1978) recommended alpha level of at least .70).

While the instrument is promising, it has only recently been published and as such has not been used widely. In fact, forward search procedures (i.e., citation searches of Hornsby et al., 2002) yielded only four other studies that have applied the measure in field settings. Two of the studies were done in the private sector (Adonisi, 2003; Brizek, 2003); the other two were completed in the public sector (Rhoads, 2005; Woods, 2004). Adonisi (2003) further analyzed the validity and reliability of the instrument. Exploring the construct validity, he completed an exploratory factor analysis, finding the factor structure was somewhat inconsistent where the data yielded four, five, and six factor solutions. Adonisi selected a five-factor solution (consistent with Hornsby et al., 2002), but there was one notable difference in Adonisi's factor structure and Hornsby et al.'s. Specifically, the organizational boundaries factor did not emerge as intended. Instead, a related factor, that Adonisi named "work improvement" emerged. Adonisi further tested and validated the

factor structure with confirmatory techniques, finding that the five-factor solution was the best fit. For instance, Adonisi showed the Goodness of Fit Index (GFI) for the five-factor solution was .96, while the four- and six-factor solutions only had GFI of .94 and .95, respectively.

Brizek (2003), Wood (2004), and Rhoads (2005) did not test the factor structure of the instrument; however, issues with the organizational boundaries dimension identified by Adonisi were consistent with the low internal consistency estimates presented by the three other authors (see Table 2 for a summary of the reliability estimates reported). For instance, Brizek (2003) found that the internal consistency for organizational boundaries was below the .70 threshold in both his pilot and post tests ($\alpha = .69$; $\alpha = .61$). Similarly, Wood (2004) reported a coefficient alpha of .67 for the organizational boundaries dimension. Rhoads (2005), in contrast, found that coefficient alpha for the organizational boundaries was much lower, ranging from .46 to .55 in three different groups of Department of Defense employees. In sum, these findings indicated that the organizational boundaries dimension may require additional refinements.

Ultimately, the five studies show that there is significant room for instrument improvement, especially for the "Organizational Boundaries" factor items. With this in mind, this study will evaluate the psychometric properties of the CEAI further and refine the instrument as needed. To do this, two analyses were conducted using Hinkin's (1998) framework for developing measures. First, the content validity of the instrument's items was tested further. Second, an exploratory factor analysis was conducted to investigate the existence of the five factors. The goal of this method is to further bolster the evidence that

exists regarding the psychometric properties, giving researchers and practitioners assurances that the instrument assesses the organization's entrepreneurial environment.

Table 2: Reported Reliabilities (Chronbach's Coefficient Alpha) of the Constructs in the CEAI

Study		Management Support	Work Discretion	Rewards / Reinforcement	Time Availability	Organizational Boundaries[a]	Work Improvement
Hornsby (2002)	Sample 1	.92	.86	.75	.77	.69	
	Sample 2	.89	.87	.75	.77	.64	
Adonisi (2003)		.88	.84	.77	.71	--	.85
Brizek (2003)	Pilot	.92	.86	.75	.77	.69	
	Post	.94	.84	.87	.72	.61	
Wood (2004)	DoD	.90	.81	.84	.79	.67	
Rhoads (2005)	Sample 1	.90	.91	.74	.71	.46	
	Sample 2	.92	.90	.86	.80	.55	
	Sample 3	.94	.90	.73	.77	.54	

[a] Adonisi (2003) did not identify an organizational boundaries factor, suggesting a work improvement factor to replace this dimension.

Summary

Corporate entrepreneurship is a rapidly spreading idea that organizations can actively encourage the innovative tendencies of their employees. Research has highlighted both tangible and intangible outcomes from corporate entrepreneurship activities. For these reasons and more, it has become important for leaders, managers, researchers, and consultants to understand and measure the antecedents of corporate entrepreneurship, so that they can diffuse these behaviors throughout their organizations and reap the benefits that have been linked to such activities. To fill this need, Hornsby et al. (2002) identified five internal environmental factors that influenced corporate entrepreneurship and developed the

Corporate Entrepreneurship Assessment Instrument (CEAI) to measure each of these factors. Hornsby et al. offered some initial evidence of the instrument's reliability and validity. While the CEAI has been used in subsequent studies (e.g., a study to determine the innovativeness of DoD agencies; Wood, Holt, Reed, Hudgens, & Coombes, 2005), the CEAI's validity and reliability have not been extensively addressed. The purpose of this study is to further evaluate the psychometric properties of the CEAI and refine the instrument.

In the next chapter, the research method will be presented. The study will be accomplished in two phases. The first phase will examine the content validity of the CEAI empirically. In this phase, two samples of graduate students will be asked to evaluate each of the items, identifying the extent to which each item reflects its intended construct. The first evaluation will be done using the method described by Schriesheim and Hinkin (1990) and Bolino and Turnley (1999). After refinements are made based on the first evaluation, a second, more stringent, evaluation will be done using the method described by Anderson and Gerbing (1991). The second phase of the study will test the factor structure of the CEAI using exploratory factor analysis. The remainder of this study includes data analysis and results, as well as, discussion, conclusions, and recommendations for future research.

II. Method

As previously noted, this study was accomplished in two phases. In the first phase of the study, two separate evaluations were used to assess the content validity of the Corporate Entrepreneurship Assessment Instrument (CEAI). To accomplish this, data were collected from two samples of graduate students completing various degree programs. Each of these groups evaluated the extent to which the items represented the five internal organizational factors the CEAI was designed to measure. In the second phase of the study, necessary refinements were made and the factor structure of the CEAI was evaluated. This phase of the study was completed by analyzing data that were previously collected in a field setting from a group of public servants. The responses provided were factor analyzed and reliability estimates computed.

Phase 1—Content Validity Assessment

> *A sorting process that assures content validity is not only necessary but relatively simple to accomplish. Oddly enough, this is probably the easiest and least time consuming part of conducting survey research as it does not require large numbers nor complex questionnaire development and administration, yet is often the most neglected.* (p. 982).
>
> Timothy R. Hinkin (1995)

Content Validity Assessment I

Participants. A group of military officers that are enrolled in an array of graduate programs at a small graduate school in the Midwest was invited to participate. As noted by Schriesheim and colleagues (Schriesheim, Powers, Scandura, Gardiner, & Lankau, 1993), the task of assessing content validity requires the participants to judge a series of statements with

respect to a set of theoretically defined categories. Therefore, no special qualifications are required beyond the cognitive ability to categorize a series of statements, making graduate students an appropriate group to complete this task. General demographic characteristics of the participants were measured. These include: gender and age. Each was measured with a single item (i.e., participants will report their age in years). Although there is no definitive number for pretest sample size, recommendations range from 12 to 30 for qualitative pretests (Anderson & Gerbing, 1991). The sample characteristics are discussed in the results.

Procedures. The instrument used to complete this task is presented at Appendix A. Participants were asked to classify each of the CEAI's 48 items into one or more of the five internal organizational factor categories that are to be measured with the items. Although Hornsby et al. (2002) offered initial definitions of the constructs, the definitions were taken from a recent study that presented more comprehensive explanations of the internal organizational factors (Kuratko et al., 2005). Items were taken directly from the Hornsby et al. (2002) and presented to the respondents in random order. The respondents were asked to place an "X" in the appropriate column if an item described only a single internal organizational factor. If the respondent determined that the item described more than one factor, they were given the option to place a "1" in the column that most closely described the item and a "2" in the column that next best described it, and so on. In addition, a sixth category, labeled "None of the Above," was included so as not to force the assignment of items to any of the five factors.

Prior to administering the Content Validity Assessment, the instrument was given to five faculty members who had some basic understanding and knowledge of the task and the

constructs being evaluated. This small group completed and evaluated the instrument's clarity. The only feedback was that there appeared to be too little randomization of items. Hence, the order of the instrument's items were adjusted.

Analysis. Following Schriesheim and Hinkin's (1990) procedures, responses were recoded and weighted where responses of "X" or "1" were coded as "3", responses of "2" were coded as "2," and responses of "3"were coded as "1". The percentage of total points for each item in each category was computed. Hinkin (1998) suggests that the minimum acceptable agreement index – the percentage of respondents who correctly classify an item – is 75 percent. However, this criterion was amended for this study, since the majority of itmes did not reach the 75 percent threshold. Instead, items were retained if the majority of respondents categorized the items in accordance with the *a priori* categorizations. This was done to ensure as many items as possible could be further tested in the second content validity assessment. At this point, refinements were made based on the item agreement indices where those items that did not reflect the intended factor were deleted from the item set.

Content Validity Assessment II

Participants. A second, separate group of military officers that was enrolled in an array of graduate programs at the same graduate school was invited to participate. Again, Hinkin (1998) suggests it may be appropriate to use a small sample of students because assessment of content validity is a cognitive task and does not require the students to understand the phenomenon under study. As with the first assessment, general demographic

characteristics (i.e. gender and age) of the participants were measured. The final content validity assessment was completed by 62 graduate students.

Procedures. The specific instrument that was used for this assessment was based on the results of the first content validity assessment. It is presented at Appendix B. This second evaluation was designed to be more rigorous than the first evaluation because respondents were asked to classify each item into one and only one category. As noted, the specific items that are included in this instrument were derived from the findings in the first evaluation (i.e., problematic items are eliminated).

Analyses. Based on Anderson and Gerbing's (1991) procedures, content validity was determined using a substantive validity analysis technique. They present two substantive validity indices that predict the extent to which a measure is related to its intended construct. The first index, the proportion of substantive agreement (p_{sa}), is defined as the proportion of respondents who assign an item to its intended construct as follows:

$$p_{sa} = n_c / N \qquad (1),$$

where n_c is the number of respondents assigning a measure to it's a priori construct and N represents the total number of respondents. The resultant values of p_{sa} range from 0.0 to 1.0, where larger values indicate greater substantive validity. It is important to note that the p_{sa} index does not indicate the extent to which an item might also be describing unintended constructs. The second index is the substantive-validity coefficient (c_{sv}). The c_{sv} is an index that reflects the extent to which respondents assign an item to its a priori construct more than any other construct. The c_{sv} is defined as follows:

$$c_{sv} = n_c - n_o / N \qquad (2),$$

where n_c and N are the same as in the first equation and n_o represents the highest number of assignments of the item to any other construct in the set. The values of c_{sv} range from -1.0 to 1.0, where larger values indicate greater substantive validity.

After the p_{sa} and the c_{sv} have been established for each item, the results of each will be analyzed consistent with Anderson and Gerbing's (1991) method of comparison. Anderson and Gerbing suggest that "in practice, a researcher would most likely employ c_{sv} in a comparative manner, retaining the subset of items with the largest values for each construct, even though values for some items may not attain statistical significance." (p. 735). For this study, items with p_{sa} and c_{sv} values greater than 0.5 were kept; items that did not meet the threshold were deleted.

In sum, a refined list of items and associated categories were developed. The refined instrument was then tested using factor structure analysis.

Phase 2—Factor Structure and Reliability Estimates

Participants. The factor structure of the items was tested using data from previous studies that examined other corporate entrepreneurship issues (Rhoads, 2005; Wood, 2004). The sample includes 264 government employees (i.e., active duty military members and civil servants) representing several organizations and several occupations. In general, the sample was 81% male with the respondent's average age falling in the 35 – 45 year range. These results are congruent with expected demographics of public servant samples.

Procedures. In both samples, data was collected electronically. Woods (2004) had participants complete a web-based questionnaire, where organizational leaders directed members of their organizations to the questionnaire site. While Rhoads (2005) collected data electronically as well, a slightly different procedure was used. Participants received an electronic message from their organizational leaders with the questionnaire attached. Participants completed the questionnaires and returned them directly to the researcher.

In both cases, individuals received advanced notice of the questionnaire along with an explanation of the study's purpose and assurances that the data collected would be anonymous. A week later, a message arrived with a link to the instrument (Wood, 2005) or an attachment including the questionnaire (Rhoads, 2005). In addition, each person received two reminders; one a week after the link or the questionnaire was available and another a few weeks later.

Analyses. Before the reliability and factor structure were tested, preliminary tests were conducted to ensure the data were appropriate for factor analysis. These include: (a) inter-item correlation matrix; (b) off-diagonal of the anti-image covariance matrix; (c) Bartlett's test of sphericity; and (d) Kaiser-Meyer-Olkin measure of sampling adequacy. First, the inter-item correlation matrix should reveal positive relationships among each of the items; however, items with correlations that exceed .90 and above were analyzed to ensure that these items were not measuring the exact same thing. Second, the values on the off-diagonal of the anti-image covariance matrix are expected to be small, indicating that the data are appropriate for factor analysis. Third, Bartlett's test of sphericity was used to determine whether the correlation matrix is an identity matrix; that is, all diagonal terms are 1

and off-diagonal terms are 0. A large Bartlett's test statistic is an indicator that the off-diagonal terms are near zero and the data are suitable for factor analysis. The fourth, and final, preliminary test is the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy which reflects the homogeneity of variables (an indicator that factor analysis is appropriate) where KMO values exceeding .70 are considered desirable.

Since the data were deemed suitable for factor analysis after these initial tests (which was the expected result given previous research using the CEAI), the items were subjected to an exploratory factor analysis. This analysis was conducted using the methods outlined by Ford, MacCallum, and Tait (1986) and Conway and Huffcutt (2003). These researchers suggest that exploratory factor analysis requires several decisions revolving around (a) the method of analyzing the data; (b) method of extracting factors; (c) the method of rotating factors; and (d) the interpretation of item loadings and cross loadings. Moreover, they have offered clear guidance that can be used to ensure "high quality" (Conway & Huffcutt, 2003; p. 150) decisions are made as the process unfolds.

The CEAI was analyzed using a components factor model, such as Principal Components Analysis (PCA). Conway and Huffcutt (2003) suggest that of the two factor models available, the components model is more appropriate when the intent is to reduce the number of variables.

When considering the number of factors to retain, researchers have several options (e.g. eigenvalues greater than one, scree test, parallel analysis, a priori theory, and retaining the number of factors that gives a high proportion of variance accounted for). Using any one of these options independently can result in too many or too few factors being retained (Conway & Huffcutt, 2003). To avoid this problem, Conway and Huffcutt suggest that

several selection techniques be used in concert with one another. Thus, decisions were made using the general rule, factors with eigenvalues greater than one, along with the scree plot and the *a priori* theory that five factors should emerge (Hornsby et al., 2002) so that errors underestimating and overestimating the number of factors are avoided (Ford et al., 1986). Also, Hinkin's (1998) suggestion that measures for most constructs should consist of four to six items was considered.

Next, researchers must choose an appropriate method of factor rotation which includes orthogonal and oblique rotations. Orthogonal rotation assumes that the factors are uncorrelated, whereas, oblique rotation assumes the factors are correlated. Oblique rotation was used in this study because "oblique rotation more accurately represents the complexity of the examined variables because constructs in the real world are rarely uncorrelated" (Ford et al., 1986, p. 296). Specifically, the direct oblimin rotation was used because it was identified by Ford et al. as an oblique rotation that has proven to "work well" (p. 296).

Finally, a standard for interpreting factor loadings should be established (Ford et al., 1986). Based on the most widely accepted criteria, items exhibiting factor loadings on the primary factor of at least .40 were retained as long as they did not exhibit high cross-loadings (greater than or equal to .35; Hinkin, 1998). However, this criterion was not automatic. Ford et al. warns the researcher that using arbitrary rules of thumb can reduce the amount of information needed to define a factor. Therefore, although it was possible to configure SPSS such that loadings were suppressed at a specific level, this feature was not used so that factors that load on the threshold of the criteria (i.e. .39) could be considered.

After factor structure was determined, inter-item correlations and coefficient alphas were used to evaluate the internal consistency of the factors that emerged. Boyle (1991)

suggests that item redundancy can be avoided by only considering factors that fall within an "optimal range" (p. 291). While Boyle (1991) asserts that inter-item correlations should be moderate to low, he does not provide numerical estimates of "moderate" and "low". In addition, factor structure was considered appropriate if the coefficient alphas were .70 or higher (Nunnally, 1978). Although this standard was initially developed over 25 years ago, Hinkin (1995) found that this standard is still adequate for research accomplished today. Finally, the item-factor correlations were evaluated against the *a priori* theory. The factor loadings from this study were compared to Hornsby et al.'s (2002) study.

This comprehensive two-phased approach was based on "high-quality decisions" (Conway & Huffcutt, 2003) and should ultimately produce high quality results.

Summary

As discussed, the study was accomplished using a two-phased approach. In the first phase, the content validity of the CEAI was evaluated using two procedures. The first procedure required a sample of graduate students to assess the extent to which the CEAI items accurately reflect the *a priori* constructs. The second, more rigorous procedure was completed by a separate sample of graduate students. This procedure was more rigorous because calculations accounted for the possibility that items may have been measuring another construct. Based on these two procedures, items that did not meet the predetermined criteria were deleted from the item set. The second phase of the study utilized exploratory factor analysis using the reduced set of items that resulted from the first phase of the study. This was accomplished using a secondary data set from a group of public servants. The next section presents the results of this study's two-phased approach.

III. Results

The overall objective of this research project was to refine the Corporate Entrepreneurship Assessment Instrument (CEAI), ensuring the items reflected the organizational factors identified and the factor structure was sound. In the first phase of the project, the items from the CEAI were assessed by two samples of independent judges to determine the extent to which the items reflected the intended dimensions. Essentially, these tests were independent pre-tests of the items and the factor definitions that had been reported in the literature (Hornsby et al., 2002; Kuratko et al., 2005). Although no universally accepted tests of content validity exists (Hinkin, 1998), the most contemporary approaches that have been suggested in the literature were used. After these content validity assessments, the items that were conceptually inconsistent with the appropriate dimensions were removed. Then, the factor structure of the CEAI was tested and reliability estimates computed. This phase of the study was completed by analyzing data that were previously collected in a field setting from a group of public servants. The results of each test are discussed in this chapter. Table 3 presents a summary of the demographics of the participants from each phase of the study. In all, 360 practitioners participated in the study. These individuals represented several occupational specialties with varying tenure in their organizations. Generally, the samples were all over 80 percent male with an average age between 30 and 45 years.

Table 3: Demographics of Experimental Samples

	Phase I		Phase II
Variables	Content Validity Assessment I (n = 34)	Content Validity Assessment II (n = 62)	Exploratory Factor Analysis (n = 264)
Average Age (years)	32	33	35 to 45
Sex			
Males (%)	85	82	81
Females (%)	8	16	19

Phase 1—Content Validity Assessment

Content Validity Assessment I

In the first content validity assessment, the items were screened by examining the proportion of participants that categorized each item as intended. Table 4 presents the items grouped according to the original factors (the item numbers reflect how the items were presented on the questionnaire) and the collated results of the categorization task that was completed by the participants. In an attempt to make the table more readable, percentages less than 10 were not included. Generally, the results indicated that the participants found the items to measure the *a priori* organizational factors. However, 10 of the original 48 items failed to meet the criterion that was established where the highest percentage of points assigned by the participants were in the intended category. Of these, five items did not appear to measure the factors that they were intended to measure because the highest number of the points assigned by participants were assigned in an unintended category. Consider the

following item: "My manager helps me get my work done by removing obstacles." Hornsby et al. (2002) indicated that this item reflected rewards. However, none of the total points that the participants assigned to this item were in the rewards category while 75 % of the points that the participants assigned to this item were in the management support category.

A closer examination of these results showed that the factor with the largest portion of "impure" items was management support (i.e., 5 of 19 items written to reflect management support were not categorized this way by participants). On the other hand, the autonomy, rewards, and time availability factors had no more than 2 items per factor that did not meet the criterion. With that said, these results suggested that the items were not as conceptually distinct as desired because there were 10 cases where the majority of points assigned by participants were not in the intended categories. Although previous research identified organizational boundaries as the most problematic construct (Hornsby et al., 2002), the management support construct appears to be more problematic (i.e., only 5 items were correctly categorized by a majority and only 6 of the remaining items approached at 40 percent agreement index).

In summary, the results identified several items that did not meet the liberal evaluative criteria that had been established. In fact, the data suggested that 10 of the original 48 items were weak and should be removed from the item pool of items. However, when viewed in perspective, nearly 75 % of the items appeared to reflect the organizational factors as expected. However, because content validity is such an important scale property, the items were subjected to a further analysis to ensure that the conclusions from this initial item screening were reasonable. This second examination is discussed in the next section.

Table 4: Results from Content Validity Assessment I

Items	MS	WD	RR	TA	OB	None
Management Support (MS): refers to the extent to which one feels that top managers are willing to facilitate and promote entrepreneurial behavior; including the championing of innovative ideas and providing the resources people require to take entrepreneurial actions.						
15. Upper management is aware and very receptive to my ideas and suggestions.	**76**					
1. Money is often available to get new project ideas off the ground.	**73**	11				11
5. My organization is quick to use improved work methods.	**57**				23	
22. There are several options within the organization for individuals to get financial support for their innovative projects and ideas.	**56**	10	23		10	
13. Senior managers encourage innovators to bend rules and rigid procedures in order to keep promising ideas on track.	**51**	15			21	
33. This organization supports many small and experimental projects realizing that some will undoubtedly fail.	**47**	28			13	
27. Many top managers have been known for their experience with the innovative process.	**46**		15		14	19
29. My organization is quick to use improved work methods that are developed by workers.	**45**	10			31	
25. In my organization, developing one's own ideas is encouraged for the improvement of the organization.	**43**	29			16	
45. People are often encouraged to take calculated risks with new ideas around here..	**43**	31			10	
43. Those employees who come up with innovative ideas on their own often receive management encouragement for their activities.	**41**	18	30		11	
20. The term "risk taker" is considered a positive attribute for people in my work area.	**35**	33			18	
31. Individual risk takers are often recognized for their willingness to champion new projects, whether eventually successful or not.	**35**	22	33			
*37. People are encouraged to talk to workers in other departments of this organization about ideas for new projects.	**32**	21			35	
*34. The "doers" are allowed to make decisions on projects without going through elaborate justification and approval processes.	**31**	52				
*18. There is a considerable desire among people in the organization for generating new ideas without regard to crossing departmental or functional boundaries.	**30**	16			41	
*47. A worker with a good idea is often given free time to develop that idea.	**24**	26		37		
*11. Individuals with successful innovative projects receive additional reward and compensation for their ideas and efforts beyond the standard reward system.	**20**		70			

Items	MS	WD	RR	TA	OB	None
*39. Promotion usually follows the development of new and innovative ideas.	**20**		60			
Work Discretion (WD): refers to the extent to which one feels that top managers tolerate failure, provide decision-making latitude and freedom from excessive oversight, and delegate authority and responsibility to lower level managers and workers.						
6. It is basically my own responsibility to decide how my job gets done.	17	**72**				
2. I feel that I am my own boss and do not have to double check all of my decisions.	19	**71**				
8. I have much autonomy on my job and am left on my own to do my own work.	14	**70**			11	
16. I almost always get to decide what I do on my job	20	**67**				
44. I have the freedom to decide what I do on my job	17	**65**			13	
19. This organization provides freedom to use my own judgment.	24	**62**			12	
24. I seldom have to follow the same work methods or steps for doing my major tasks from day to day.	11	**55**			22	
12. This organization provides the chance to be creative and try my own methods of doing the job.	33	**44**			15	
28. This organization provides the chance to do something that makes use of my abilities.	30	**35**	15		17	
*36. Harsh criticism and punishment result from mistakes made on the job.	16	**24**	37		10	14
Rewards / Reinforcement (RR): refers to the extent to which one feels that top managers develop and use systems that reward based on performance, highlight significant achievements, and encourage pursuit of challenging work.						
41. The rewards I receive are dependent upon my work on the job.	11		**77**			
38. My supervisor will give me special recognition if my work performance is especially good.	24		**70**			
32. My supervisor will increase my job responsibilities if I am performing well in my job.	28	10	**50**		11	
*26. My manager would tell his boss if my work was outstanding.	50		**44**			
14. There is a lot of challenge in my job.	14	20	**28**			22
*9. My manager helps me get my work done by removing obstacles.	75		**0**			
Time Availability (TA): refers to the extent to which one feels that individuals and groups have the time needed to pursue innovations and that their jobs are structured in ways that support efforts to achieve short- and long-term organizational goals.						
23. I always seem to have plenty of time to get everything done.				**76**	10	
7. I feel that I am always working with time constraints on my job.	11			**74**		
3. I have just the right amount of time and work load to do everything well.	11	14		**73**		
48. My co-workers and I always find time for long-term problem solving.	15	15		**68**		

Items	MS	WD	RR	TA	OB	None
40. During the past three months, my work load was too heavy to spend time on developing new ideas.	16	12		**67**		
35. My job is structured so that I have very little time to think about wider organizational problems.		10		**60**	13	
Organizational Boundaries (OB): refers to the extent to which one feels that precise explanations of outcomes expected from organizational work and development of mechanisms for evaluating, selecting, and using innovations exist within the organization.						
10. There are many written rules and procedures that exist for doing my major tasks.	15	17			**64**	
21. In the past three months, I have always followed standard operating procedures or practices to do my major tasks.		19			**62**	
17. My job description clearly specifies the standards of performance on which my job is evaluated.	10		14		**59**	11
46. There is little uncertainty in my job.	15	14			**49**	19
42. I clearly know what level of work performance is expected from me in terms of amount, quality, and timeliness of output.	13	21		10	**47**	
4. On my job I have no doubt of what is expected of me.	21	22			**44**	
*30. During the past year, my immediate supervisor discussed my work performance on which my job is evaluated.	39		29		**22**	

Note. The Factors are labeled as follows: MS = Management Support, WD = Work Discretion, RR = Rewards / Reinforcement, TA = Time Availability, and OB = Organizational Boundaries. The Hornsby et al. (2002) a priori assignment of each item is indicated in bold. The highest assignment for each item is indicated by an underscore. If the number is bold and underscored, then it is the largest number of the population classified the item in accordance with its a priori category. Items marked by an asterisk (*) did not meet the validity criteria.

Content Validity Assessment II

In the second content validity assessment, the items were subjected to a more rigorous screening. Calculations included the proportion of respondents who assign an item to its intended construct, the proportion of substantive agreement (p_{sa}), and the coefficient of substantive (c_{sv}) the index that reflects the extent to which respondents assign an item to its a priori construct more than any other construct. Table 5 presents the five organizational factors, the items grouped according to their *a priori* factor (the item numbers reflect how the items were presented on the questionnaire), and the resultant values of the substantive validity tests. As with the first content validity assessment, the results generally indicated that the participants found the items to measure the *a priori* organizational factors.

The data in Table 5 reinforces the findings from the first content validity assessment. The management support construct remains the most problematic construct (i.e., 6 items in management support fail to meet the established criteria). The work discretion construct is also problematic where 3 of the 9 items failed to meet the .50 threshold. In contrast, only one item intended to reflect time availability did not meet the threshold, while all items in the organizational boundaries and rewards constructs met the required criteria.

In summary, the results of the second content validity test suggested that a substantial number of weak items remaining after the first content validity test. An additional ten of the remaining 38 items failed to meet the selection criteria, where the proportion of substantive and the coefficient of both exceeded the .5 threshold. Still, nearly 60% of the original items were retained at the conclusion of Phase I. Unfortunately, two additional items were excluded from the subsequent analysis because the secondary data set used in this study excluded those items

Table 5. Results from Content Validity Assessment II

	Substantive Validity	
Item	P_{sa}	C_{sv}
Management Support: refers to the extent to which one feels that top managers are willing to facilitate and promote entrepreneurial behavior; including the championing of innovative ideas and providing the resources people require to take entrepreneurial actions.		
1. Money is often available to get new project ideas off the ground.	.94	.90
*5. My organization is quick to use improved work methods.	.63	.44
10. Senior managers encourage innovators to bend rules and rigid procedures in order to keep promising ideas on track.	.77	.69
13. Upper management is aware and very receptive to my ideas and suggestions.	.89	.81
*17. The term "risk taker" is considered a positive attribute for people in my work area.	.58	.39
*22. In my organization, developing one's own ideas is encouraged for the improvement of the organization.	.61	.45
19. There are several options within the organization for individuals to get financial support for their innovative projects and ideas.	.79	.65
23. Many top managers have been known for their experience with the innovative process.	.73	.55
*26. My organization is quick to use improved work methods that are developed by workers.	.61	.40
*28. Individual risk takers are often recognized for their willingness to champion new projects, whether eventually successful or not.	.31	-.23
31. This organization supports many small and experimental projects realizing that some will undoubtedly fail.	.73	.63
*34. Those employees who come up with innovative ideas on their own often receive management encouragement for their activities.	.55	.11
36. People are often encouraged to take calculated risks with new ideas around here	.68	.52
Work Discretion (WD): refers to the extent to which one feels that top managers tolerate failure, provide decision-making latitude and freedom from excessive oversight, and delegate authority and responsibility to lower level managers and workers.		
2. I feel that I am my own boss and do not have to double check all of my decisions.	.94	.89
6. It is basically my own responsibility to decide how my job gets done.	.90	.85
8. I have much autonomy on my job and am left on my own to do my own work.	.95	.94
*11. This organization provides the chance to be creative and try my own methods of doing the job.	.55	.21
14. I almost always get to decide what I do on my job	.95	.92
16. This organization provides freedom to use my own judgment.	.90	.84
*21. I seldom have to follow the same work methods or steps for doing my major tasks from day to day.	.69	.44
*25. This organization provides the chance to do something that makes use of my abilities.	.19	-.21

35. I have the freedom to decide what I do on my job	.97	.95
Rewards / Reinforcement (RR): refers to the extent to which one feels that top managers develop and use systems that reward based on performance, highlight significant achievements, and encourage pursuit of challenging work.		
**12. There is a lot of challenge in my job.	.66	.52
27. My supervisor will increase my job responsibilities if I am performing well in my job.	.76	.63
30. My supervisor will give me special recognition if my work performance is especially good.	.97	.95
32. The rewards I receive are dependent upon my work on the job.	.95	.92
Time Availability (TA): refers to the extent to which one feels that individuals and groups have the time needed to pursue innovations and that their jobs are structured in ways that support efforts to achieve short- and long-term organizational goals		
3. I have just the right amount of time and work load to do everything well.	.92	.89
7. I feel that I am always working with time constraints on my job.	.95	.92
20. I always seem to have plenty of time to get everything done.	.97	.94
*24. My job is structured so that I have very little time to think about wider organizational problems.	.55	.19
29. During the past three months, my work load was too heavy to spend time on developing new ideas.	.97	.94
38. My co-workers and I always find time for long-term problem solving.	.92	.87
Organizational Boundaries (OB): refers to the extent to which one feels that precise explanations of outcomes expected from organizational work and development of mechanisms for evaluating, selecting, and using innovations exist within the organization.		
4. On my job I have no doubt of what is expected of me.	.74	.60
**9. There are many written rules and procedures that exist for doing my major tasks.	.74	.55
15. My job description clearly specifies the standards of performance on which my job is evaluated.	.76	.60
18. In the past three months, I have always followed standard operating procedures or practices to do my major tasks.	.77	.59
33. I clearly know what level of work performance is expected from me in terms of amount, quality, and timeliness of output.	.79	.68
37. There is little uncertainty in my job.	.90	.84

Note. The factors represent the Hornsby et al. (2002) a priori assignments of each item. Items marked by an asterisk (*) did not meet the validity criteria. Items marked by two asterisks(**) met the validity criteria but were not included in the secondary data set and were therefore excluded from analysis.

based on low internal consistency. As a result, 26 items were used in the Phase II. The next section describes the results of the exploratory factor analysis and internal consistency tests.

Phase 2—Factor Structure and Reliability Estimates

Before the reliability and factor structure were tested, preliminary tests were conducted to ensure the data were appropriate for factor analysis. These included: (a) inter-item correlation matrix; (b) off-diagonal of the anti-image covariance matrix; (c) Bartlett's test of sphericity; and (d) Kaiser-Meyer-Olkin measure of sampling adequacy. Table 6 presents the inter-item correlations, the mean inter-item correlation among each the items intended to measure different dimensions was relatively high. For instance, the average inter-item correlations of the items intended to measure management support was .498 (all correlations were significant, $p < .001$) while the mean inter-item correlation among each of the items intended to measure time availability was .535 (all correlations were significant, $p < .001$). In contrast (see Table 7), the anti-image covariance matrix revealed very small values on the off diagonal. The mean value for the off diagonal was -.020.

Moreover, the Bartlett's test of sphericity was significant (χ^2 (210) =2157, $p < .000$) and the measure of sampling adequacy (KMO = .842) can be interpreted as "meritorious" (Hair et al., 1995, p. 374) because it reached the desired value of .80 or above. Taken all together, results from these preliminary tests indicated that there were considerable relationships among the items, suggesting that the data were suitable for further analysis and the items might be represented by some underlying factor structure.

Table 6. Inter-item Correlations

Item	8	10	12	16	20	23	25	26	27	28
8. Senior managers encourage innovators to bend rules and rigid procedures in order to keep promising ideas on track.	-									
10. Money is often available to get new projects off the ground.	.142	-								
12. There are several options within the organization for individuals to get financial support for their innovative projects and ideas.	.247	.658	-							
16. This organization supports many small and experimental projects realizing that some will undoubtedly fail.	.289	.383	.454	-						
20. I feel that I am my own boss and do not have to double check all of my decisions.	.348	.216	.263	.328	-					
23. This organization provides freedom to use my own judgment.	.286	.318	.358	.332	.551	-				
25. I have the freedom to decide what I do on my job.	.272	.134	.254	.326	.505	.515	-			
26. It is basically my own responsibility to decide how my job gets done.	.281	.208	.255	.319	.524	.597	.591	-		
27. I almost always get to decide what I do on my job.	.240	.207	.253	.304	.560	.504	.705	.616	-	
28. I have much autonomy on my job and am left on my own to do my own work.	.300	.241	.304	.385	.549	.611	.661	.718	.663	-
31. The rewards I receive are dependent upon my work on the job.	.187	.284	.362	.330	.210	.350	.195	.287	.195	.315
32. My supervisor will increase my job responsibilities if I am performing well in my job.	.189	.210	.191	.225	.122	.310	.253	.352	.170	.308
33. My supervisor will give me special recognition if my work performance is especially good.	.102	.207	.178	.214	.207	.339	.142	.286	.147	.242
36. During the past three months, my workload was too heavy to spend time on developing new ideas.	.101	.223	.254	.214	.103	.102	.059	.066	.143	.127
37. I always seem to have plenty of time to get everything done.	.061	.242	.241	.093	.073	.015	-.002	-.035	.037	.014
38. I have just the right amount of time and workload to do everything well.	.154	.239	.309	.211	.149	.188	.108	.103	.123	.147
41. My co-workers and I always find time for long-term problem-solving.	.262	.313	.348	.347	.300	.246	.261	.269	.276	.321
42. In the past three months, I have always followed standard operating procedures or practices to do major tasks.	-.080	.118	.048	.013	-.062	.041	-.019	-.066	-.074	-.036
45. There is little uncertainty in my job.	.059	.090	.121	-.018	.182	.146	.026	.118	.076	.070
47. My job description clearly specifies the standards of performance on which my job is evaluated.	.139	.138	.196	.192	.073	.133	.027	.082	.003	.086
48. I clearly know what level of work performance is expected from me in terms of amount, quality, and timeliness of output.	.063	.186	.229	.097	.156	.290	.123	.218	.122	.224

Table 6 Inter-item Correlations Continued

Item	31	32	33	36	37	38	41	42	45	47
8. Senior managers encourage innovators to bend rules and rigid procedures in order to keep promising ideas on track.										
10. Money is often available to get new projects off the ground.										
12. There are several options within the organization for individuals to get financial support for their innovative projects and ideas.										
16. This organization supports many small and experimental projects realizing that some will undoubtedly fail.										
20. I feel that I am my own boss and do not have to double check all of my decisions.										
23. This organization provides freedom to use my own judgment.										
25. I have the freedom to decide what I do on my job.										
26. It is basically my own responsibility to decide how my job gets done.										
27. I almost always get to decide what I do on my job.										
28. I have much autonomy on my job and am left on my own to do my own work.										
31. The rewards I receive are dependent upon my work on the job.	-									
32. My supervisor will increase my job responsibilities if I am performing well in my job.	.499	-								
33. My supervisor will give me special recognition if my work performance is especially good.	.533	.528	-							
36. During the past three months, my workload was too heavy to spend time on developing new ideas.	.085	-.070	.001	-						
37. I always seem to have plenty of time to get everything done.	.043	-.058	-.039	.588	-					
38. I have just the right amount of time and workload to do everything well.	.129	-.003	.053	.565	.757	-				
41. My co-workers and I always find time for long-term problem-solving.	.232	.122	.155	.445	.395	.458	-			
42. In the past three months, I have always followed standard operating procedures or practices to do major tasks.	.060	-.088	.066	.046	.133	.131	.057	-		
45. There is little uncertainty in my job.	.111	.016	.110	.118	.123	.112	.115	.183	-	
47. My job description clearly specifies the standards of performance on which my job is evaluated.	.409	.262	.376	-.024	.069	.201	.195	.141	.199	-
48. I clearly know what level of work performance is expected from me in terms of amount, quality, and timeliness of output.	.323	.359	.356	-.060	-.012	.128	.190	.073	.201	.593

Table 7. Anti-image of Off-diagonal

Item	8	10	12	16	20	23	25	26	27	28
8. Senior managers encourage innovators to bend rules and rigid procedures in order to keep promising ideas on track.	.777									
10. Money is often available to get new projects off the ground.	.037	.505								
12. There are several options within the organization for individuals to get financial support for their innovative projects and ideas.	-.055	-.261	.457							
16. This organization supports many small and experimental projects realizing that some will undoubtedly fail.	-.051	-.065	-.098	.627						
20. I feel that I am my own boss and do not have to double check all of my decisions.	-.111	-.008	.016	-.054	.505					
23. This organization provides freedom to use my own judgment.	-.031	-.049	-.024	.006	-.110	.452				
25. I have the freedom to decide what I do on my job.	-.011	.073	-.046	-.029	-.030	-.042	.393			
26. It is basically my own responsibility to decide how my job gets done.	-.010	.003	.007	-.002	-.034	-.070	-.025	.392		
27. I almost always get to decide what I do on my job.	.020	-.037	.014	.007	-.079	.001	-.166	-.065	.383	
28. I have much autonomy on my job and am left on my own to do my own work.	-.013	.000	.004	-.038	-.033	-.061	-.075	-.128	-.066	.338
31. The rewards I receive are dependent upon my work on the job.	.005	.020	-.088	-.040	.001	-.034	.030	.014	-.010	-.035
32. My supervisor will increase my job responsibilities if I am performing well in my job.	-.076	-.052	.038	-.027	.094	-.005	-.067	-.065	.044	-.012
33. My supervisor will give me special recognition if my work performance is especially good.	.053	-.022	.038	-.004	-.052	-.057	.037	-.024	2.9e-005	.019
36. During the past three months, my workload was too heavy to spend time on developing new ideas.	.004	.002	-.012	-.059	.047	-.010	.037	.011	-.038	-.019
37. I always seem to have plenty of time to get everything done.	.024	-.052	-.003	.057	-.039	.051	.002	.025	-.001	.009
38. I have just the right amount of time and workload to do everything well.	-.025	.038	-.029	-.025	.020	-.059	-.005	-.013	.010	.000
41. My co-workers and I always find time for long-term problem-solving.	-.073	-.042	-.007	-.064	-.044	.048	-.028	-.021	-.001	-.025
42. In the past three months, I have always followed standard operating procedures or practices to do major tasks.	.058	-.080	.046	-.013	.071	-.048	-.058	.027	.047	-.007
45. There is little uncertainty in my job.	-.010	.018	-.038	.092	-.095	-.022	.037	-.047	-.008	.028
47. My job description clearly specifies the standards of performance on which my job is evaluated.	-.075	.022	.009	-.080	.016	.051	-.001	.016	.015	.018
48. I clearly know what level of work performance is expected from me in terms of amount, quality, and timeliness of output.	.083	-.009	-.047	.089	-.011	-.060	.025	.001	-.007	-.031

Table 7 Anti-image of Off- Diagonal Continued

Item	31	32	33	36	37	38	41	42	45	47
8. Senior managers encourage innovators to bend rules and rigid procedures in order to keep promising ideas on track.										
10. Money is often available to get new projects off the ground.										
12. There are several options within the organization for individuals to get financial support for their innovative projects and ideas.										
16. This organization supports many small and experimental projects realizing that some will undoubtedly fail.										
20. I feel that I am my own boss and do not have to double check all of my decisions.										
23. This organization provides freedom to use my own judgment.										
25. I have the freedom to decide what I do on my job.										
26. It is basically my own responsibility to decide how my job gets done.										
27. I almost always get to decide what I do on my job.										
28. I have much autonomy on my job and am left on my own to do my own work.										
31. The rewards I receive are dependent upon my work on the job.	.538									
32. My supervisor will increase my job responsibilities if I am performing well in my job.	-.141	.536								
33. My supervisor will give me special recognition if my work performance is especially good.	-.145	-.177	.561							
36. During the past three months, my workload was too heavy to spend time on developing new ideas.	-.026	.047	-.022	.534						
37. I always seem to have plenty of time to get everything done.	.003	-.037	.025	-.111	.345					
38. I have just the right amount of time and workload to do everything well.	.013	.031	.001	-.077	-.218	.343				
41. My co-workers and I always find time for long-term problem-solving.	-.014	.013	-.012	-.128	-.034	-.050	.606			
42. In the past three months, I have always followed standard operating procedures or practices to do major tasks.	-.029	.110	-.049	.039	-.032	-.018	-.009	.870		
45. There is little uncertainty in my job.	-.037	.025	-.002	-.064	-.031	.035	.003	-.143	.850	
47. My job description clearly specifies the standards of performance on which my job is evaluated.	-.116	.037	-.080	.065	.006	-.058	-.021	-.046	-.068	.512
48. I clearly know what level of work performance is expected from me in terms of amount, quality, and timeliness of output.	.037	-.104	-.013	.039	.037	-.028	-.053	.005	-.055	-.265

Exploratory Factor Analysis

Exploratory factor analysis was performed in accordance with methods suggested by Conway and Huffcutt (2003). (Note: Principal Axis Factor analysis was also accomplished. However, this data was excluded from the study since the factor structure that emerged was similar to the principal components model.) This sample yielded 12.6 to 1 cases to item ratio. This ratio exceeds the ideal 10:1 cases to items (Nunnally, 1978). Moreover, the sample far exceeds the minimum recommended sample size of 150 recommended by Hinkin (1998). When the 26 items retained from the Phase 1 were analyzed, 6 factors emerged with eigenvalues greater than one. These factors accounted for 63.4% of the variance observed. Unfortunately, 5 items exhibited loadings that warranted the removal of the items from the pool. The remaining items were again factor analyzed and the factor structure and loadings were evaluated using the same procedure described in the method. Finally, five interpretable factors were obtained, using 21 of the original items. These five factors accounted for 62.8 % of the observed variance.

Table 8 shows the 5-factor solution that emerged through principal components factor analysis using an oblique rotation, as well as the eigenvalues and percent variance explained. Each factor was titled based on the items that comprised them and the *a priori* categorizations suggested by Hornsby et al. (2002).

Three items loaded on factor 1 termed *management support*. Hornsby et al. (2002) had originally designed each of these items to measure this construct. Generally, these items represented the participants' perceptions regarding financial support and tolerance of failure.

Table 8. Results from Exploratory Factor Analysis

Item	Original Construct *	MS	WD	RR	TA	OB
10. Money is often available to get new projects off the ground.	MS	.88				
12. There are several options within the organization for individuals to get financial support for their innovative projects and ideas.	MS	.81				
16. This organization supports many small and experimental projects realizing that some will undoubtedly fail.	MS	.58				
8. Senior managers encourage innovators to bend rules and rigid procedures in order to keep promising ideas on track.	MS		.32			
20. I feel that I am my own boss and do not have to double check all of my decisions.	WD		.77			
23. This organization provides freedom to use my own judgment.	WD		.67			
25. I have the freedom to decide what I do on my job.	WD		.85			
26. It is basically my own responsibility to decide how my job gets done.	WD		.81			
27. I almost always get to decide what I do on my job.	WD		.87			
28. I have much autonomy on my job and am left on my own to do my own work.	WD		.83			
31. The rewards I receive are dependent upon my work on the job.	RR			.65		
32. My supervisor will increase my job responsibilities if I am performing well in my job.	RR			.70		
33. My supervisor will give me special recognition if my work performance is especially good.	RR			.74		
47. My job description clearly specifies the standards of performance on which my job is evaluated.	OB			.77		
48. I clearly know what level of work performance is expected from me in terms of amount, quality, and timeliness of output.	OB			.71		
36. During the past three months, my workload was too heavy to spend time on developing new ideas.	TA				.80	
37. I always seem to have plenty of time to get everything done.	TA				.89	
38. I have just the right amount of time and workload to do everything well.	TA				.88	
41. My co-workers and I always find time for long-term problem-solving.	TA				.59	
42. In the past three months, I have always followed standard operating procedures or practices to do major tasks.	OB					.71
45. There is little uncertainty in my job.	OB					.68
Eigenvalue		1.11	5.88	2.23	2.65	1.29
Percent Variance Explained		5.303	27.98	10.62	12.61	6.15

Note. The factors are labeled as follows: MS = Management Support, WD = Work Discretion, RR = Rewards / Reinforcement, TA = Time Availability, and OB = Organizational Boundaries. The original construct represents the Hornsby et al. (2002) a priori assignment of each item is indicated in bold.

Seven items loaded on factor 2 termed *work discretion.* All but one item were concerned with autonomy, decision making freedom, delegated authority, and the like. The other item, "Senior managers encourage innovators to bend rules and rigid procedures in order to keep promising ideas on track," was originally deemed *management support,* is still a weak item that only loaded at the .32 level.

Five items loaded on factor 3 termed *rewards and reinforcement.* Three of the items were consistent with the *a priori* categorizations; two were not. The other two came from the *organizational boundaries* categorization. Unlike the *management support* item that grouped with *work discretion,* these two items loaded at the same magnitude as the three items that were originally categorized as *rewards and reinforcement.*

Four items loaded on factor 4 termed *time availability*. All of the items were originally deemed in this category.

As expected, the *organizational boundaries* construct was problematic. Only two items loaded on *organizational boundaries,* and both items were concerned more with role clarity than organizational structure. Since both items concerned role clarity, it was deemed that this factor should be renamed. Role clarity is where a member is clear about the expectations of his or her role set and the scope and responsibility of his or her job (Anakwe & Greenhaus, 1999). This construct is further explained in the discussion chapter that follows.

To a certain extent, the two content validity tests predicted that some items might group with constructs other than their original construct. For example, the item asking (Item 47 in Table 8), "My job description clearly specifies the standards of performance

on which my job is evaluated," originally deemed to measure organizational boundaries, emerged as an item that measured rewards. Even though this item was categorized as organizational boundaries by the majority of participants in Content Validity Assessment I, the next highest category was rewards (which is consistent with the factor analysis) suggesting the item may tap more than one construct.

Estimates of Internal Consistency

The internal consistency of each of the five factors that emerged was estimated using Chronbach's coefficient alpha (α). The resulting reliabilities were .73, .87, .79, .83, and .35 for management support, work discretion, rewards, time availability, and organizational boundaries, respectively. As expected, the organizational boundaries construct had a low reliability. This low reliability could be attributed to the function of the number of items (only two items remained in this construct) or to the problematic nature of the construct as detailed by Hornsby et al. (2002).

Summary

The goal of this research was to refine the CEAI to ensure the items reflect the organizational factor constructs and to ensure that the factor structure was consistent with previous research. In sum, the CEAI was reduced from 48 items to 21 items using a two-phased approach. In the first phase of the project, the items were subjected to two separate content validity tests. The first test identified 10 items that were problematic; the second test identified an additional 10 items that did not meet the content validity criteria. After these content validity assessments, the remaining items were subjected to factor analysis and internal consistency tests. Through factor analysis, a five-factor solution emerged that accounted for 62% of the variance. The next chapter discusses what the results mean, a revision of the problematic items, limitations of this study, implications to managers, and recommendations for future research.

IV. Discussion

And to keep America competitive, one commitment is necessary above all. We must continue to lead the world in human talent and creativity. Our greatest advantage in the world has always been our educated, hardworking, ambitious people -- and we're going to keep that edge. Tonight I announce an American Competitiveness Initiative, to encourage innovation throughout our economy, and to give our nation's children a firm grounding in math and science… and ensure that America will lead the world in opportunity and innovation for decades to come.

President George W. Bush (2006)

An emergent body of literature on corporate entrepreneurship attempts to identify and define the organizational environment required to encourage entrepreneurial activities. This study contributes to that body of literature by refining an instrument designed to measure the salient characteristics of that environment and the corresponding items designed to measure each characteristic (see Hornsby et al., 2002). In this final chapter, the results of this effort will be discussed, evaluated, and interpreted. After discussing the results, the contributions, limitations, and recommendations for future research will be presented.

Study Overview

Hornsby et al. (2002) synthesized the extant literature to identify five internal organizational factors that influence corporate entrepreneurship. These included: management support, work discretion and autonomy, rewards and reinforcement, time availability, and organizational boundaries. From this, Hornsby et al. developed and presented the Corporate Entrepreneurship Assessment Instrument (CEAI)—a survey instrument designed to measure each factor. While the CEAI has shown promise, it has only recently been published and applied in a field setting on four occasions (Adonisi, 2003; Brizek, 2003; Rhoads, 2005; Woods, 2004). Thus, researchers have suggested that further tests of reliability and validity be conducted (Hornsby et al., 2002).

Accordingly, this study further evaluated the CEAI using Hinkin's (1998) framework for developing measures in the organizational sciences. The first phase of this study assessed the content validity of the items. This process served as a pre-test of the items, guiding the deletion of those items that were deemed conceptually inconsistent (Hinkin, 1998) with the five dimensions presented by Hornsby et al. (2002). This analysis was deemed important because previous research suggested item overlap. Adonisi (2003) and Hornsby et al. (2002), for instance, found several items to be unstable. The first content validity assessment reinforced these findings and highlighted how difficult it is for researchers to develop items that reflect a single construct. In this case, participants indicated that many of the items included on the CEAI appeared to tap several different factors when given the chance to categorize them into more than one. In

all, the data suggested that a quarter of the original items were conceptually inconsistent and should be removed from the item pool.

To further ensure that items reflected a single construct, a second content validity test was conducted. Unlike the first test where participants were permitted to categorize items in multiple categories, participants were only permitted to indicate a single construct that was reflected in the item. This second content validity assessment yielded similar results. That is, another ten items failed to meet the selection criteria. Moreover, participants indicated that several items appeared to tap a construct other than the one intended (demonstrated by negative p_{sa} and c_{sv} values) and no item was categorized by *all* participants as measuring the intended constructs (demonstrated by the fact that in no case did $p_{sa} = c_{sv}$). Based on this, one could conclude that the remaining items still posed problems; however, the content validity assessments did offer a set of items that were expected to represent a reasonable measure of *a priori* factors (albeit a list of items reduced by over 50 %).

Per Hinkin's (1998) guidance, the items that appeared to have a basic level of content validity were subjected to an exploratory factor analysis and internal consistency tests. A five factor solution emerged that closely mimicked the five dimensions presented by Hornsby et al. (2002) with one notable exception. These included: management support, work discretion, rewards and reinforcement, time availability, and role clarity.

Despite the similarities, a few inconsistencies were observed. First, consider the constructs that emerged. The management support dimension originally consisted of 19 items and was reduced to only three. Each of these items suggested that management

should offer financial support and be tolerant of calculated failure to be entrepreneurial. In addition, a unique role clarity factor emerged rather that the organizational boundaries factor identified by previous studies. The items associated with this factor suggested that corporate entrepreneurship is fostered when expectations are clearly defined and standard operating procedures are established. Although the role clarity factor was not aligned with the previous studies, the role clarity concept was widely discussed in the literature that Hornsby et al. (2002) used to originally identify the five factors. For example, Quinn (1985) suggests that innovation flourishes when management clearly defines the organization's vision, implying that this vision will focus the individual roles of members (i.e., provides role clarity) toward creative and entrepreneurial behaviors.

When considering the inconsistencies among the items, several did not load on intended factors. One item, "Senior managers encourage innovators to bend rules and rigid procedures in order to keep promising ideas on track," that was originally intended to measure management support appeared to measure work discretion and autonomy. Two items, "My job description clearly specifies the standards of performance on which my job is evaluated;" and "I clearly know what level of work performance is expected from me in terms of amount, quality, and timeliness of output," were originally designed to measure organizational boundaries, but grouped with the items composing the rewards factor. Notably, these items were not misclassified in the original content validity tests. The definition of rewards and reinforcement construct proposed by Kuratko et al. (2005) was "to the extent to which one feels that top managers develop and use systems that reward based on performance, highlight significant achievement, and encourage pursuit

of challenging work." Perhaps the focus on "performance" should be emphasized in these two items.

In sum, the refinements made to the CEAI through this study provide some additional evidence of content validity, construct validity, and reliability (e.g., estimates of internal consistency). Although there is considerable room for improvement, the instrument's scales displayed acceptable levels of internal consistency. Unfortunately, the dimensionality and factor structure that emerged from the field data were not completely consistent with what was originally hypothesized by Hornsby et al. (2002). While five factors emerged, these five factors did not completely reflect the constructs that were originally posited. Therefore, further work should attempt to refine the distinctions between the factors that influence corporate entrepreneurship. This is discussed in the subsequent section.

Theoretical Recommendations

The results indicate that the constructs measured by the CEAI and the items used to measure those constructs require some refinements to resolve conceptual inconsistencies. Before items can be refined and tested, theoretical definitions for each of the constructs measured by the CEAI should be refined. These definitions are a starting point for the generation of items and will facilitate the subsequent test of the items' content validity. Hornsby et al. (2002) implicitly suggested that the constructs measured by the CEAI are aspects of an organization's climate. Climate represents the collective or shared perceptions of an organization's general practices and procedures (Patterson et

al., 2005). Thus, each of the constructs measured by the CEAI should be defined such that they reflect elements of climate.

Table 9 presents revised versions of the constructs along with the definitions. For the most part, these definitions are in-line with the definitions suggested by Kuratko et al. (2005). The definitions and associated items for the rewards and reinforcement, time availability, and work discretion and autonomy constructs are all consistent with Hornsby et al.'*s* (2002) study and are represented by at least four items. On the other hand, the Management support items should be revisited to make sure that the three items fully capture the intent of the management support definition: "Management support refers to the extent to which one feels that top managers are willing to facilitate and promote entrepreneurial behavior; including the championing of innovative ideas and providing the resources people require to take entrepreneurial actions." Similarly, the role clarity construct should be revisited to make sure that the intent of the role clarity definition is fully captured by the two items.

In sum, the major difference between these revised definitions and those presented originally revolves around the organizational boundaries construct. Two items were renamed role clarity and management support now encompasses tolerance for failure.

Table 9. Refined Construct Definitions and Associated Items

Revised Definition	Associated Items
Management Support: refers to an environment where managers encourage entrepreneurial behaviors by providing financial support for many innovative projects within the organization while realizing (and tolerating) that some of those projects will undoubtedly fail	Money is often available to get new projects off the ground.[a*]
	There are several options within the organization for individuals to get financial support for their innovative projects and ideas.[a*]
	This organization supports many small and experimental projects realizing that some will undoubtedly fail.[a*]
	Our managers consider the term "risk taker" a positive attribute.[b]
	Individual risk takers are encouraged to champion new projects, whether eventually successful or not.[b]
	People are often encouraged to take calculated risks with new ideas around here.[a]
Work Discretion / Autonomy: refers to an environment where managers provide individuals with decision-making latitude and freedom from excessive oversight, and where managers delegate authority and responsibility to lower level managers and workers	I feel that I am my own boss and do not have to double check all of my decisions.[a*]
	Innovators are encouraged to bend rules and rigid procedures in order to keep promising ideas on track.[bc*]
	This organization provides freedom to use my own judgment.[a*]
	I have the freedom to decide what I do on my job.[a]
	It is basically my own responsibility to decide how my job gets done.[a*]
	I almost always get to decide what I do on my job.[a*]
	I have much autonomy on my job and am left on my own to do my own work.[a*]
	The "doers" are allowed to make decisions on projects without going through elaborate justification and approval procedures.[ac]
Rewards / Reinforcement: refers to an environment that reinforces entrepreneurial behaviors by explicitly linking performance and achievement to rewards.	The rewards I receive are dependent upon my work on the job.[a*]
	My supervisor will increase my job responsibilities if I am performing well in my job.[a*]
	My supervisor will give me special recognition if my work performance is especially good.[a*]
	My job description clearly specifies the standards of performance on which my job is evaluated.[ac*]
	I clearly know what level of work performance is expected from me in terms of amount, quality, and timeliness of output.[ac*]
	Promotion usually follows the development of new and innovative ideas.[ac]

	Individuals with successful innovative projects receive additional reward and compensation for their ideas and efforts beyond the standard reward system. [ac]
	Harsh criticism and punishment result from mistakes made on the job. [ac]
	Those employees who come up with innovative ideas on their own often receive management encouragement for their activities. [ac]
Time Availability: refers to an environment that facilitates individuals and groups to have the time needed to pursue innovations towards efforts to achieve short- and long-term organizational goals	During the past three months, my workload was too heavy to spend time on developing new ideas. [a*]
	I always seem to have plenty of time to get everything done. [a*]
	I have just the right amount of time and workload to do everything well. [a*]
	My co-workers and I always find time for long-term problem-solving. [a*]
	A worker with a good idea is often given free time to develop that idea. [ac]
	I have very little free time to think about wider organizational problems. [bc]
Role Clarity: refers to the extent to which one feels that precise explanations of outcomes expected from organizational work are defined and where a portion of that work is innovation	In the past three months, I have always followed standard operating procedures or practices to do major tasks. [a*]
	There is little uncertainty in my job. [a*]
	On my job I have no doubt of what is expected of me. [a]
	Written rules and procedures clearly define my major tasks. [b]
	This organization provides the chance to be creative and try my own methods of doing the job. [ac]

[a] *Identical item from Hornsby et al*
[b] *Item revised*
[c] *Item originally categorized as a different category than it is associated with now.*
**Item was identified through Exploratory Factor Analysis*

Items were revised so that they met the specifications put forth by Hinkin (1998), who prescribed methods of writing good questionnaire items. The specifications used to write the items for this measure included: (a) each item should be consistent with those originally presented by Hornsby et al. (2002); (b) each item should be designed to measure one specific factor; (c) each item should be worded so that a cross-section of the organization could respond to include both subordinates and supervisors; (d) each item should be worded to describe a situation-specific aspect of the organization's climate; and, (e) approximately the same number of positively phrased items and items that are to be reverse-scored should be written.

One suggested revision concerns an item (originally classified as management support, but grouped with work discretion), "Senior managers encourage innovators to bend rules and rigid procedures in order to keep promising ideas on track." To better fit the work discretion construct, the item should be revised. If the item was reworded to "Innovators are encouraged to bend rules and rigid procedures in order to keep promising ideas on track," it would draw the focus away from management support completely**.** In addition, some of the Hornsby et al.'s original items that did not meet content validity and Exploratory Factor Analysis criteria were revised completely in order to rebuild the pool of items. For example, "Our managers consider the term "risk taker" a positive attribute" had to be revised to include a reference to management (all managers, not just top management). Furthermore, items from other constructs that were identified as tapping a new construct were added to the list of items for that construct. For instance, the item "Promotion usually follows the development of new and innovative ideas" was overwhelmingly classified as belonging to the rewards and reinforcement construct.

Therefore, this item should be included in the rewards and reinforcement construct for future tests of the instrument.

Finally, items were revised so that future respondents could express their level of agreement using a 7-point Likert-type response format (e.g., 1 = *strongly disagree*, 2 = *disagree*, 3 = *slightly disagree*, 4 = *neither disagree or agree*, 5 = *slightly agree*, 6 = *agree*, 7 = *strongly agree*) consistent with Hornsby et al. (2002). This type of response format was selected for many reasons. First, researchers have argued that scales developed from items using these response formats are approximately equal interval. Second, items developed to fit this type of response format could be modified easily to other formats, giving researchers and practitioners flexibility when administering these items. Also, many organizational surveys use these formats so the time to administer a questionnaire of this type would likely be minimal because little time would be spent on instructions and examples. Finally, these response formats have been suitable for the use of machine-scored answer forms in the future.

Limitations

There are a few limitations to this study that must be addressed. Several of these limitations are the result of using a secondary data set. First, this study was limited to a single exploratory factor analysis procedure. Although the sample size was appropriate for factor analysis when the two samples were combined, neither sample was large enough to be considered independently for factor analysis. Second, it is important to note

that the secondary data set was collected using a group of public servants. Therefore, results regarding the scale may not be generalizeable to private-sector organizations.

Third, the two samples that were merged into one large sample used slightly different versions of the CEAI. As a result, two items were excluded from factor analysis. Fourth, the two samples' demographic questions for age were coded differently (e.g. one sample used years and another used ranges of years), and therefore the demographic information had to be summarized. Since this information was not used during any of the analysis phase, it is the least important limitation that was introduced by the use of secondary data. The limitations introduced by the use of secondary data were dealt with upfront and were accounted for during analysis. Since the study was designed to use secondary data the researcher was at the mercy of available data. Unfortunately, the CEAI is still a fairly new measure whose psychometric properties have not been fully evaluated (e.g. only four studies in the past 3 years have used the scale, etc.).

Another limitation includes a relaxation of the first content validity assessment's criteria. This was done to allow the most items to be retested in the second, more rigorous content validity test. The original criteria (75 percent agreement index) was suggested by Hinkin (1995) was relaxed so that all items would be retained when respondents correctly assigned the majority of points to the *a priori* category.

However, even with these limitations, this study systematically evaluated the scale and showed the CEAI items and definitions deserve a closer look.

Future Research

This study takes the first step at refining the CEAI. Future research should evaluate the suggested refinements by testing the face, content, convergent, and divergent validities. This refined measure needs to be implemented in the field, in both the public and private sectors.

Summary

As noted, this study is important for both theoretical and practical reasons. This study contributes to the literature on Corporate Entrepreneurship by refining a practically useful measure of innovative tendencies of organizational personnel. The Corporate Entrepreneurship Assessment Instrument (CEAI) is promising because of several reasons. The CEAI measures antecedents in a way that provides managers with a guide to encourage entrepreneurship activities. The CEAI measures entrepreneurial behaviors at the individual level. As discussed, this is important because corporate entrepreneurship requires individuals to exhibit entrepreneurial behaviors. Also, the CEAI is fairly short and results are easily interpreted. This may encourage more and more organizations to implement the CEAI so that they can reap the benefits that Corporate Entrepreneurship activities have been shown to lead to.

Appendix A: Content Validity Assessment I

CONTENT VALIDITY EVALUATION

INTERNAL ORGANIZATIONAL FACTORS QUESTIONNAIRE

The purpose of this questionnaire is to determine if corporate entrepreneurship measurement items adequately represent internal organizational factors. Beginning on the next page, a list of measurement items is provided. Each item may belong to one or more of the following factors:

A. ***Management Support*** refers to the extent to which one feels that top managers are willing to facilitate and promote entrepreneurial behavior; including the championing of innovative ideas and providing the resources people require to take entrepreneurial actions.

B. ***Work Discretion / Autonomy*** refers to the extent to which one feels that top managers tolerate failure, provide decision-making latitude and freedom from excessive oversight, and delegate authority and responsibility to lower level managers and workers.

C. ***Rewards / Reinforcement*** refers to the extent to which one feels that top managers develop and use systems that reward based on performance, highlight significant achievements, and encourage pursuit of challenging work.

D. ***Time Availability*** refers to the extent to which one feels that individuals and groups have the time needed to pursue innovations and that their jobs are structured in ways that support efforts to achieve short- and long-term organizational goals.

E. ***Organizational Boundaries*** refers to the extent to which one feels that precise explanations of outcomes expected from organizational work and development of mechanisms for evaluating, selecting, and using innovations exist within the organization.

F. ***None of the above*** refers to a statement that you feel clearly does not fall into the other categories.

INSTRUCTIONS

Carefully read each item. Then, think about the internal organizational factor category or categories (types A through F above) that you feel that particular item belongs to.

If you feel the statement describes **ONLY ONE** factor, place an **X** in the appropriate column.

If you feel the statement describes **MORE THAN ONE** factor, place a **1** in the column that you feel **BEST** describes it, a **2** in the column that **NEXT BEST** describes it, and so on.

Be sure to note that ***categories A through E describe internal organizational factors that DO and DO NOT encourage corporate entrepreneurship***. Some examples follow:

Items	A	B	C	D	E	F
E1. Upper management is aware and very receptive to my ideas and suggestions.	**X**					
E2. My supervisor will give me special recognition if my work performance is especially good.	**2**		**1**			
E3. Money is often available to get new project ideas off the ground.	**X**					
E4. My job is structured so that I have very little time to think about wider organizational problems.				**2**	**1**	

Categorization Task

Please categorize the internal organizational factor(s) that each of these items relates to. Please be sure to categorize each item, and do not omit any. Use category F, the "none of the above" category, only as a last resort—that is, only after you have carefully thought about a item and have decided that it does not fit any of the other factors.

The internal organizational factors that these items may belong to are as follows:

A = ***Management Support*** refers to the extent to which one feels that top managers are willing to facilitate and promote entrepreneurial behavior, including the championing of innovative ideas and providing the resources people require to take entrepreneurial actions.

B = ***Work Discretion / Autonomy*** refers to the extent to which one feels that top managers tolerate failure, provide decision-making latitude and freedom from excessive oversight, and delegate authority and responsibility to lower level managers and workers.

C = ***Rewards / Reinforcement*** refers to the extent to which one feels that top managers develop and use systems that reward based on performance, highlight significant achievements, and encourage pursuit of challenging work.

D = ***Time Availability*** refers to the extent to which one feels that individuals and groups have the time needed to pursue innovations and that their jobs are structured in ways that support efforts to achieve short- and long-term organizational goals

E = ***Organizational Boundaries*** refers to the extent to which one feels that precise explanations of outcomes expected from organizational work and development of mechanisms for evaluating, selecting, and using innovations exists within the organization.

F = ***None of the above*** refers to a statement that you feel clearly does not fall into the other categories.

Items	A	B	C	D	E	F
1. Money is often available to get new project ideas off the ground.						
2. I feel that I am my own boss and do not have to double check all of my decisions.						
3. I have just the right amount of time and work load to do everything well.						
4. On my job I have no doubt of what is expected of me.						
5. My organization is quick to use improved work methods.						
6. It is basically my own responsibility to decide how my job gets done.						
7. I feel that I am always working with time constraints on my job.						
8. I have much autonomy on my job and am left on my own to do my own work.						
9. My manager helps me get my work done by removing obstacles.						
10. There are many written rules and procedures that exist for doing my major tasks.						

A. ***Management Support*** refers to the extent to which one feels that top managers are willing to facilitate and promote entrepreneurial behavior, including the championing of innovative ideas and providing the resources people require to take entrepreneurial actions.

B. ***Work Discretion / Autonomy*** refers to the extent to which one feels that top managers tolerate failure, provide decision-making latitude and freedom from excessive oversight, and delegate authority and responsibility to lower level managers and workers.

C. ***Rewards / Reinforcement*** refers to the extent to which one feels that top managers develop and use systems that reward based on performance, highlight significant achievements, and encourage pursuit of challenging work.

D. ***Time Availability*** refers to the extent to which one feels that individuals and groups have the time needed to pursue innovations and that their jobs are structured in ways that support efforts to achieve short- and long-term organizational goals.

E. ***Organizational Boundaries*** refers to the extent to which one feels that precise explanations of outcomes expected from organizational work and development of mechanisms for evaluating, selecting, and using innovations exists within the organization.

Items	A	B	C	D	E	F
11. Individuals with successful innovative projects receive additional reward and compensation for their ideas and efforts beyond the standard reward system.						
12. This organization provides the chance to be creative and try my own methods of doing the job.						
13. Senior managers encourage innovators to bend rules and rigid procedures in order to keep promising ideas on track.						
14. There is a lot of challenge in my job.						
15. Upper management is aware and very receptive to my ideas and suggestions.						
16. I almost always get to decide what I do on my job						
17. My job description clearly specifies the standards of performance on which my job is evaluated.						
18. There is a considerable desire among people in the organization for generating new ideas without regard to crossing departmental or functional boundaries.						
19. This organization provides freedom to use my own judgment.						
20. The term “risk taker” is considered a positive attribute for people in my work area.						
21. In the past three months, I have always followed standard operating procedures or practices to do my major tasks.						
22. There are several options within the organization for individuals to get financial support for their innovative projects and ideas.						
23. I always seem to have plenty of time to get everything done.						
24. I seldom have to follow the same work methods or steps for doing my major tasks from day to day.						
25. In my organization, developing one’s own ideas is encouraged for the improvement of the organization.						

A. ***Management Support*** refers to the extent to which one feels that top managers are willing to facilitate and promote entrepreneurial behavior, including the championing of innovative ideas and providing the resources people require to take entrepreneurial actions.

B. ***Work Discretion / Autonomy*** refers to the extent to which one feels that top managers tolerate failure, provide decision-making latitude and freedom from excessive oversight, and delegate authority and responsibility to lower level managers and workers.

C. ***Rewards / Reinforcement*** refers to the extent to which one feels that top managers develop and use systems that reward based on performance, highlight significant achievements, and encourage pursuit of challenging work.

D. ***Time Availability*** refers to the extent to which one feels that individuals and groups have the time needed to pursue innovations and that their jobs are structured in ways that support efforts to achieve short- and long-term organizational goals.

E. ***Organizational Boundaries*** refers to the extent to which one feels that precise explanations of outcomes expected from organizational work and development of mechanisms for evaluating, selecting, and using innovations exists within the organization.

Items	A	B	C	D	E	F
26. My manager would tell his boss if my work was outstanding.						
27. Many top managers have been known for their experience with the innovative process.						
28. This organization provides the chance to do something that makes use of my abilities.						
29. My organization is quick to use improved work methods that are developed by workers.						
30. During the past year, my immediate supervisor discussed my work performance on which my job is evaluated.						
31. Individual risk takers are often recognized for their willingness to champion new projects, whether eventually successful or not.						
32. My supervisor will increase my job responsibilities if I am performing well in my job.						
33. This organization supports many small and experimental projects realizing that some will undoubtedly fail.						
34. The “doers” are allowed to make decisions on projects without going through elaborate justification and approval processes.						
35. My job is structured so that I have very little time to think about wider organizational problems.						
36. Harsh criticism and punishment result from mistakes made on the job.						
37. People are encouraged to talk to workers in other departments of this organization about ideas for new projects.						
38. My supervisor will give me special recognition if my work performance is especially good.						
39. Promotion usually follows the development of new and innovative ideas.						
40. During the past three months, my work load was too heavy to spend time on developing new ideas.						

A. ***Management Support*** refers to the extent to which one feels that top managers are willing to facilitate and promote entrepreneurial behavior, including the championing of innovative ideas and providing the resources people require to take entrepreneurial actions.

B. ***Work Discretion / Autonomy*** refers to the extent to which one feels that top managers tolerate failure, provide decision-making latitude and freedom from excessive oversight, and delegate authority and responsibility to lower level managers and workers.

C. ***Rewards / Reinforcement*** refers to the extent to which one feels that top managers develop and use systems that reward based on performance, highlight significant achievements, and encourage pursuit of challenging work.

D. ***Time Availability*** refers to the extent to which one feels that individuals and groups have the time needed to pursue innovations and that their jobs are structured in ways that support efforts to achieve short- and long-term organizational goals.

E. ***Organizational Boundaries*** refers to the extent to which one feels that precise explanations of outcomes expected from organizational work and development of mechanisms for evaluating, selecting, and using innovations exists within the organization.

Items	A	B	C	D	E	F
41. The rewards I receive are dependent upon my work on the job.						
42. I clearly know what level of work performance is expected from me in terms of amount, quality, and timeliness of output.						
43. Those employees who come up with innovative ideas on their own often receive management encouragement for their activities.						
44. I have the freedom to decide what I do on my job						
45. People are often encouraged to take calculated risks with new ideas around here..						
46. There is little uncertainty in my job.						
47. A worker with a good idea is often given free time to develop that idea.						
48. My co-workers and I always find time for long-term problem solving.						

Background Information

This final section contains items regarding your personal characteristics. This information will be used to describe the group of people that completed this questionnaire.

1. What is your age? _____ years

2. What is your gender?

Male
Female

Please <u>DO NOT PUT YOUR NAME</u> on this questionnaire.

Feel free to make comments on the back of this page.

Thank you for your participation!

Appendix B: Content Validity Assessment II

CONTENT VALIDITY EVALUATION

INTERNAL ORGANIZATIONAL FACTORS QUESTIONNAIRE

The purpose of this questionnaire is to determine if corporate entrepreneurship measurement items adequately represent internal organizational factors. Beginning on the next page, a list of measurement items is provided. Each item may belong to one of the following factors:

A. ***Management Support*** refers to the extent to which one feels that top managers are willing to facilitate and promote entrepreneurial behavior; including the championing of innovative ideas and providing the resources people require to take entrepreneurial actions.

B. ***Work Discretion / Autonomy*** refers to the extent to which one feels that top managers tolerate failure, provide decision-making latitude and freedom from excessive oversight, and delegate authority and responsibility to lower level managers and workers.

C. ***Rewards / Reinforcement*** refers to the extent to which one feels that top managers develop and use systems that reward based on performance, highlight significant achievements, and encourage pursuit of challenging work.

D. ***Time Availability*** refers to the extent to which one feels that individuals and groups have the time needed to pursue innovations and that their jobs are structured in ways that support efforts to achieve short- and long-term organizational goals.

E. ***Organizational Boundaries*** refers to the extent to which one feels that precise explanations of outcomes expected from organizational work and development of mechanisms for evaluating, selecting, and using innovations exist within the organization.

INSTRUCTIONS

Carefully read each item. Then, think about the internal organizational factor category or categories (types A through E above) that you feel that particular item belongs to.

In the left most column, place the letter that corresponds to the **ONE** internal organizational factor that you feel the item **BEST** describes.

Be sure to note that ***categories A through E describe internal organizational factors that DO and DO NOT encourage corporate entrepreneurship***. Some examples follow

Factor Category	Items
A	E1. Upper management is aware and very receptive to my ideas and suggestions.
C	E2. My supervisor will give me special recognition if my work performance is especially good.
A	E3. Money is often available to get new project ideas off the ground.
D	E4. My job is structured so that I have very little time to think about wider organizational problems.

Categorization Task

Please categorize the internal organizational factor(s) that each of these items relates to. Please be sure to categorize each item, and do not omit any.

The internal organizational factors that these items may belong to are as follows:

A = ***Management Support*** refers to the extent to which one feels that top managers are willing to facilitate and promote entrepreneurial behavior, including the championing of innovative ideas and providing the resources people require to take entrepreneurial actions.

B = ***Work Discretion / Autonomy*** refers to the extent to which one feels that top managers tolerate failure, provide decision-making latitude and freedom from excessive oversight, and delegate authority and responsibility to lower level managers and workers.

C = ***Rewards / Reinforcement*** refers to the extent to which one feels that top managers develop and use systems that reward based on performance, highlight significant achievements, and encourage pursuit of challenging work.

D = ***Time Availability*** refers to the extent to which one feels that individuals and groups have the time needed to pursue innovations and that their jobs are structured in ways that support efforts to achieve short- and long-term organizational goals.

E = ***Organizational Boundaries*** refers to the extent to which one feels that precise explanations of outcomes expected from organizational work and development of mechanisms for evaluating, selecting, and using innovations exists within the organization.

Concept Assignment	Items
	1. Money is often available to get new project ideas off the ground.
	2. I feel that I am my own boss and do not have to double check all of my decisions.
	3. I have just the right amount of time and work load to do everything well.
	4. On my job I have no doubt of what is expected of me.
	5. My organization is quick to use improved work methods.
	6. It is basically my own responsibility to decide how my job gets done.
	7. I feel that I am always working with time constraints on my job.
	8. I have much autonomy on my job and am left on my own to do my own work.
	9. There are many written rules and procedures that exist for doing my major tasks.
	10. Senior managers encourage innovators to bend rules and rigid procedures in order to keep promising ideas on track.
	11. This organization provides the chance to be creative and try my own methods of doing the job.
	12. There is a lot of challenge in my job.
	13. Upper management is aware and very receptive to my ideas and suggestions.
	14. I almost always get to decide what I do on my job

A. ***Management Support*** refers to the extent to which one feels that top managers are willing to facilitate and promote entrepreneurial behavior, including the championing of innovative ideas and providing the resources people require to take entrepreneurial actions.
B. ***Work Discretion / Autonomy*** refers to the extent to which one feels that top managers tolerate failure, provide decision-making latitude and freedom from excessive oversight, and delegate authority and responsibility to lower level managers and workers.
C. ***Rewards / Reinforcement*** refers to the extent to which one feels that top managers develop and use systems that reward based on performance, highlight significant achievements, and encourage pursuit of challenging work.
D. ***Time Availability*** refers to the extent to which one feels that individuals and groups have the time needed to pursue innovations and that their jobs are structured in ways that support efforts to achieve short- and long-term organizational goals.
E. ***Organizational Boundaries*** refers to the extent to which one feels that precise explanations of outcomes expected from organizational work and development of mechanisms for evaluating, selecting, and using innovations exists within the organization.

Concept Assignment	Items
	15. My job description clearly specifies the standards of performance on which my job is evaluated.
	16. This organization provides freedom to use my own judgment.
	17. The term "risk taker" is considered a positive attribute for people in my work area.
	18. In the past three months, I have always followed standard operating procedures or practices to do my major tasks.
	19. There are several options within the organization for individuals to get financial support for their innovative projects and ideas.
	20. I always seem to have plenty of time to get everything done.
	21. I seldom have to follow the same work methods or steps for doing my major tasks from day to day.
	22. In my organization, developing one's own ideas is encouraged for the improvement of the organization.
	23. Many top managers have been known for their experience with the innovative process.
	24. My job is structured so that I have very little time to think about wider organizational problems.
	25. This organization provides the chance to do something that makes use of my abilities.
	26. My organization is quick to use improved work methods that are developed by workers.
	27. My supervisor will increase my job responsibilities if I am performing well in my job.
	28. Individual risk takers are often recognized for their willingness to champion new projects, whether eventually successful or not.
	29. During the past three months, my work load was too heavy to spend time on developing new ideas.
	30. My supervisor will give me special recognition if my work performance is especially good.
	31. This organization supports many small and experimental projects realizing that some will undoubtedly fail.
	32. The rewards I receive are dependent upon my work on the job.
	33. I clearly know what level of work performance is expected from me in terms of amount, quality, and timeliness of output.
	34. Those employees who come up with innovative ideas on their own often receive management encouragement for their activities.
	35. I have the freedom to decide what I do on my job

A. ***Management Support*** refers to the extent to which one feels that top managers are willing to facilitate and promote entrepreneurial behavior, including the championing of innovative ideas and providing the resources people require to take entrepreneurial actions.
B. ***Work Discretion / Autonomy*** refers to the extent to which one feels that top managers tolerate failure, provide decision-making latitude and freedom from excessive oversight, and delegate authority and responsibility to lower level managers and workers.
C. ***Rewards / Reinforcement*** refers to the extent to which one feels that top managers develop and use systems that reward based on performance, highlight significant achievements, and encourage pursuit of challenging work.
D. ***Time Availability*** refers to the extent to which one feels that individuals and groups have the time needed to pursue innovations and that their jobs are structured in ways that support efforts to achieve short- and long-term organizational goals.
E. ***Organizational Boundaries*** refers to the extent to which one feels that precise explanations of outcomes expected from organizational work and development of mechanisms for evaluating, selecting, and using innovations exists within the organization.

Concept Assignment	Items
	36. People are often encouraged to take calculated risks with new ideas around here.
	37. There is little uncertainty in my job.
	38. My co-workers and I always find time for long-term problem solving.

Background Information

This final section contains items regarding your personal characteristics. This information will be used to describe the group of people that completed this questionnaire.

1. What is your age? _____ years

2. What is your gender?

Male
Female

Please <u>DO NOT PUT YOUR NAME</u> on this questionnaire.

Feel free to make comments on the back of this page.

Thank you for your participation!

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Vita

Captain Tassika M. Davis graduated from Choctawhatchee High School in Fort Walton Beach, Florida. She entered undergraduate studies at Auburn University in Auburn, Alabama where she graduated with a Bachelor of Science degree in Biomedical Sciences in June 1999. She was commissioned after completion of Officer Training School in January of 2000.

After completion of Basic Communications Officer Training at Keesler AFB, Mississippi, Captain Davis' first assignment was at McGuire AFB as the 305th Communications Squadron Executive Officer. She later transitioned into the 305th Operations Group, also as an Executive Officer. Her next assignment was to Cheyenne Mountain AFS, Colorado as a Systems Center Crew Commander. While stationed in Colorado, she was accepted to enter the Information Resource Management graduate program offered by the Graduate School of Engineering and Management at the Air Force Institute of Technology. Upon graduation, Captain Davis will be assigned to the Air Force Communications Agency located at Scott AFB, Illinois.

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14. ABSTRACT

The implementation of corporate entrepreneurship is becoming an important activity for private- and public-sector organizations. Organizational factors have been linked to successful corporate entrepreneurship. The Corporate Entrepreneurship Assessment Instrument (CEAI) is an instrument that attempts to measure the effectiveness of the key internal organizational factors, or climate, that influence innovative activities and behaviors. This study attempted to assess the content validity and factor structure of the CEAI and thus add weight to the psychometric soundness of the instrument. In sum, the effectiveness of the instrument was tested using the framework for scale development presented by Hinkin (1998). Overall, the CEAI was found to be a relatively stable instrument. In fact, the factor structure that emerged only slightly varied from the original instrument developed by Hornsby, Kuratko, and Zahra (2002).

15. SUBJECT TERMS

Corporate Entrepreneurship, Innovation, Instrument

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