

INITIAL DEVELOPMENT AND VALIDATION OF THE ENTREPRENEURIAL  
ORIENTATION PROFILE INVENTORY (EOPi)

by

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B.S., Kansas State University, 2005  
M.S., Kansas State University, 2007

AN ABSTRACT OF A DISSERTATION

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## Abstract

Entrepreneurship represents an important path to job creation, product development and organizational competitive advantage. Therefore, the identification and retention of entrepreneurial talent is of primary importance. The Entrepreneurial Orientation Profile Inventory (EOPI) was developed to evaluate the Proactiveness, Innovativeness and Risk-Taking dimensions of Entrepreneurial Orientation using a situational judgment test (SJT) testing methodology. The current research outlines the initial development of the testing items and provides a preliminary review of the process used to develop a scoring key and evaluate the psychometric properties of the measure among two independent samples.

Study 1 focused on developing a key to score and evaluate data in subsequent samples. In Study 1, 49 adult workers provided ratings regarding the most and least effective response to 12 business-related scenarios designed to measure the Proactiveness, Innovativeness and Risk-Taking dimensions of Entrepreneurial Orientation. Interrater consistency analyses were conducted to determine the correct rank order of the response options within the most and least effective response conditions. In the most effective condition, raters reached consensus on the correct ranking of the response options for 7 of the 12 items. In the least effective condition, raters reached consensus on the correct ranking of the response options for 9 of the 12 items. The highest ranked response option was identified as the “correct” response and used as a scoring key in Study 2.

This finding suggests individuals are generally better at identifying a single best *ineffective* solution to a business-related problem, but less effective at identifying a single best *effective* solution to a business-related problem. Thus, when using an SJT format to evaluate

business-related problems, asking respondents to identify the least effective responses is likely to provide better identification of a “correct” response. Items for which the adult sample reached agreement were retained for further examination in Study 2.

Study 2 was conducted to evaluate the impact of three response option instruction and scoring methodologies (i.e., “most effective”, least effective” or a combined “most and least effective”) on the reliability and validity of the EOPI measure. Using a sample of 188 undergraduate students, the construct and criterion validity of the EOPI measure as a unidimensional composite and at the item level was evaluated. Across the three conditions, the results of the construct and criterion validity analyses generally failed to support the EOPI instrument as an effective method to evaluate Entrepreneurial Orientation at the composite level. The modest correlation coefficients among the criteria variables suggest a potentially broader measurement issue with currently available measures of Entrepreneurship in general.

Within the “least effective” response instruction condition, minor significant results were found at the item level. A review of these items provides insight into how modifications of EOPI items may facilitate future item development. Further, the current research also suggests that biographical data may provide insight into the measurement of Entrepreneurial Orientation. A biodata-based unidimensional composite of Entrepreneurial Behavior was found to be both marginally reliable and significantly related to an alternative measure of Entrepreneurial Orientation. The development of additional biodata items that correlate with the current items is likely to improve the psychometric properties of the Entrepreneurial Orientation composite and provide insight into the role of previous experience as a valid and reliable indicator of Entrepreneurial Orientation and Entrepreneurship behaviors.

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## **Dedication**

First and foremost, this manuscript is dedicated in memory of Grandma and Grandpa Smith, Darlene and Marvin. Thank you for your guidance, patience, care, love and inspiration. Through your positive influence on my brother, Kenneth Eugene Smith, you have no doubt been very instrumental in this process. Love and miss you both! In addition, I would like to dedicate this to my nieces and nephews. Dream big and work hard!

# **Chapter 1 - Entrepreneurship**

## **Introduction**

The importance of Entrepreneurship to job creation and the strength of a nation has been established in research (Arthurs & Busenitz, 2003; Athayde, 2008; Burgelman, 1983; Covin & Miles, 1999; Guth & Ginsberg, 1990; Haynie & Shepherd, 2009; Thornberry, 2002). New ventures serve as the principal force facilitating new job creation, wealth, and competitive advantage (Birch, 1987; Covin & Miles, 1999; Kibas & K'Aol, 2004; Kirchoff, 1995; Lyon, Lumpkin, & Dess, 2000; Reynolds & White, 1997). As the global economic environment increases in competitiveness, the pressure for businesses to encourage, identify, and develop entrepreneurial skills within their workforce is an important concern for industrialized and growing nations (Athayde, 2008).

Many young people are attracted by the increased level of autonomy, personal control and freedom found in an independent work environment. If they are to find success in Entrepreneurship, it is important that these young people are equipped with the necessary skills, knowledge and competencies vital for new venture success (Izquierdo & Deschoolmeester, 2008). Even within the established organization, entrepreneurs represent a competitive advantage in a number of ways. For instance, in interviews with industry executives, Sathe (2003) found that industry experts had very reserved opinions regarding the availability of true entrepreneurs. One executive stated that “in 1,000 births...there probably aren't 100 that have even a shred of creativity” (p. 237). Another executive insisted that within an organization, sixty-percent will innovate, thirty-percent are implementers, but only ten-percent are “really the truly creative ones” (p. 239). Thus, as the marketing environment becomes increasingly more technological, global and competitive, hiring and retaining workers who think and act

innovatively, proactively and adaptively can represent an organizational competitive advantage (Barney & Arian, 2001; Covin & Miles, 1999; Covin & Slevin, 1989, 1991; Miles & Darroch, 2006; Schendel, 1990).

A second way in which entrepreneurs provide a valuable organizational competitive advantage is by serving as an immobile and scarce resource for the organization. Immobile resources are resources that are inelastic in supply, scarce or non-easily imitable or substituted (Barney & Arian, 2001). Entrepreneurs bring certain individual differences including to an organization that are scarce within the population in general (Sathe, 2003). To the extent that entrepreneurs within an organization can capitalize on their technical, communication, networking, management and innovative skills to design innovative ideas and services, entrepreneurs represent an immobile resource for an organization that cannot be easily imitated.

Oftentimes, the impetus for a new venture creation stems from the entrepreneur's dissatisfaction with his or her current employment situation and a desire to increase one's decision making ability and earning potential (Haynes, Becherer, Helms, & Jones, 1999; Noorderhaven, Thurik, Wennekers, van Stel, 2004). When these entrepreneurs leave an organization, they not only take their personal knowledge and skills (thereby reducing the organization's human capital competitive advantage), but also are equipped with knowledge of the organization's innovative activities, marketing practices, pricing strategies, contacts and suppliers, and other critical proprietary information. This information, in turn, can be modified and utilized to effectively compete with the organization. Considering the importance of entrepreneurs as a distinct and significant competitive advantage to an organization, the ability of an organization to identify, select and retain employees who have the capability to effectively engage in innovative, discovery and creative processes represents an important goal. The



purpose of the current research is to develop a measure of Entrepreneurial Orientation (EO), labeled the Entrepreneurial Orientation Profile Inventory (EOPI), using primarily a situational judgment test (SJT) methodology. In addition, this research project intends to provide a preliminary evaluation of the construct and criterion validity of the measure. Attitude and biographical data measures of alternative entrepreneurial constructs and entrepreneurial behaviors will be used to evaluate the construct and criterion validity of the EOPI measure.

Lumpkin and Dess (1996) defined EO as “the processes, practices, and decision-making activities that lead to new [market or venture] entry” (p. 136). Further, they conceptualized Entrepreneurial Orientation as consisting of three primary dimensions, which are: Proactiveness, Innovativeness and Risk-Taking. To understand Entrepreneurial Orientation, it is critical to understand Entrepreneurship and its associated theoretical development. Likewise, to understand Entrepreneurship, it is helpful to review it in the context of its parallels to Leadership theory. The next section begins with an evaluation of Leadership theory and maps its development to a number of key parallels in Entrepreneurship theory development. Following, a review of six primary schools of Entrepreneurship theory is presented and evaluated. Then, a link from a few of these theories to the development of Entrepreneurial Orientation literature is highlighted.

### **Leadership Theories**

The iterative process involved in evaluating, measuring, and conceptualizing Entrepreneurship parallels research on Leadership theory. Early in its history, Leadership development theory was plagued by ambiguity and a lack of precision (Bennis, 1959; Janda, 1960; Stogdill, 1974). In particular, Leadership theorists found it difficult to distinguish between Leadership and multiple alternative business-related constructs including management, power, authority, and supervision (Yukl, 2006). As a result, multiple theories and models of Leadership

were introduced in an effort to identify the characteristics that were important for effective Leadership. These theories ranged from a focus on the individual innate traits to a focus on leadership attitudes, skills and behaviors. Then, Leadership theories focused on the dyadic influence process of leaders and followers. Next, theories focused on the attributes of the work environment and how the work environment could potentially act as a substitute for formal Leadership (Horner, 1997; Yukl, 2006). In the next section, a brief review of each of these theoretical tracks is evaluated.

Early Leadership models evaluated the innate traits distinguishing leaders from others. According to the trait theory, leaders are not developed, but rather born with identifying personal qualities that uniquely distinguish them as leaders. As such, efforts to develop and create leaders through training, development or other interventions were determined to be impractical. Innate leadership abilities were considered to be possessed by only a select few and as such it was important to identify these characteristics within subjects when selecting those who would become effective leaders. Individual characteristics related to tireless persistence, enhanced intuition, uncanny foresight, and supreme persuasiveness were among a few of the many characteristics determined to be innate to “natural born leaders” (Yukl, 2006).

Following the limited success of the trait-based approach to Leadership, theoretical efforts began shifting towards understanding the impact of leadership attitudes, skills and behaviors as identifying characteristics of successful leaders (Horner, 1997; Yukl, 2006). Thus, rather than focusing on the personal characteristics of the leader, this stream of Leadership theory took into account the behavioral actions of the leader to understand the factors leading to overall Leadership effectiveness. In response, leadership theories focusing on leadership

behaviors and leadership adaptive styles (e.g., participative leadership; path-goal leadership) were evaluated next (Yukl, 2006).

Leadership research has also emphasized the importance of follower empowerment and the influence process as critical to the development and growth of effective leaders (Bass, 1985, 1990; Bass & Riggio, 2006; Day, 2000; Kark, Shamir, & Chen, 2003). For instance, Bass (1985) discussed the importance of leaders to role model inspiring, motivational and considerate behaviors with their subordinates. Leaders who were effective at modeling desirable leadership behavior and providing opportunities for their followers to display leadership were more likely to have a positive influence on their followers' leadership development (Gasper, 1992). Similarly, Day (1994, 2000) found that when leaders were able to create a culture in which information sharing, teamwork and strong mentoring and social networks existed, followers had a greater likelihood of developing effective leadership skills (Day, 1994, 2000; Kelloway, Barling, & Helleur, 2000; Lowe, Kroeck, & Sivasubramaniam, 1996).

Leadership substitutes have also been explored. Leadership substitute theories focused on the impact of work design, increased autonomy and the use of work groups and work teams as effective methods to reduce the need for formal leadership (Horner, 1997). Thus, elements of the contextual and situational characteristics of the work environment were determined to play a critical role in the development of individual leaders. Thus, through the years, Leadership theories have evolved from an early focus on the personal characteristics of the leader, to a latter focus on individual behaviors and follower empowerment. In the next section, a review of Entrepreneurship literature will be reviewed citing how its development closely parallels leadership theory development.

## **Entrepreneurship Theories**

For years, entrepreneurship research has been limited by a lack of clarity of the construct, its dimensions, its measurement and its theoretical conceptualization (Bull & Willard, 1993; Gartner, 1989, 1990; Sexton, 2001; Virtanen, 1997). This has hampered the ability of researchers and practitioners to definitively classify entrepreneurship as a unique business-related concept (Bruyat & Julien, 2000), and not just a “special case of good management and leadership” (McCline, Bhat, & Baj, 2000, p. 82). Low and MacMillan (1988) reviewed the Entrepreneurship literature and concluded that the questions that have been asked, the unit of analyses at which Entrepreneurship has been conceptualized and measured, and the theories and methodologies that have been used to explore this concept have all created confusion in understanding the critical factors uniquely distinguishing Entrepreneurship.

Virtanen (1997) specifically noted the difficulties associated with distinguishing between the terms “entrepreneur” (individual), “entrepreneurial” (behaviors), and “Entrepreneurship” (process). In particular, Virtanen emphasized the need for Entrepreneurship research to understand the collective influence of the Entrepreneur and one’s behaviors as they contribute to the facilitation of the entrepreneurial process and the sustained long-term vitality of the Entrepreneur. This conceptual confusion led Bruyat and Julien (2000) to conclude that “when there is no consensus on a paradigm, or at least on the main research object of the field, researchers tend to speak after one another, rather than to one another...and knowledge cannot be accumulated” (p. 166). As a result, authors such as McCline et al., (2000) have suggested that “research is needed to help better document the validity of the Entrepreneurship construct if it is to remain more than just a special case of good management and leadership” (p. 82).

In the following section, the study will evaluate literature on Entrepreneurship and specifically address some of the similarities between theories of Entrepreneurship and theories of

Leadership. Then, a review of different theories of Entrepreneurship that have dominated the research will be evaluated. Finally, a discussion of entrepreneurial orientation and the methods and processes that will be used to develop and evaluate the construct will be reviewed.

Cunningham and Lischeron (1991) defined six “schools” of theory that have been used to define entrepreneurship. These theories were labeled: 1) the “Great Person” theory; 2) the “Psychological Characteristics” theory; 3.) the “Classical Entrepreneurship” theory; 4) the “Management as Entrepreneurship” theory; and 5) the “Leadership as Entrepreneurship” theory; and 6.) the “Intrapreneurship” theory of Entrepreneurship. Each of these theories takes a differential perspective on 1.) how an entrepreneurial propensity is developed within and among entrepreneurs and 2.) the differential role of personality, attitudes, values and behaviors as a facilitator of the Entrepreneurship process. An evaluation of each of these theories can help to extract specific themes that underlie entrepreneurial and innovative behavior. Further, the following will also provide insight into how the various facets of individual-, organizational- and environmental-related factors and experiences influence the development of an Entrepreneurial Orientation among workers. In the following, each of these theories will be reviewed and discussed to understand how each contributes to a greater understanding of how an Entrepreneurial Orientation is developed within an individual.

### ***Great Person Theory of Entrepreneurship***

The “Great Person” theory of Entrepreneurship assumes that successful entrepreneurs have innate traits and a natural gift to be entrepreneurial. Just as others have natural talents that allow them to be successful managers, athletes or organizational leaders, entrepreneurs possess special unique qualities that allow them to see opportunities, gather together the resources necessary to exploit these opportunities, and successfully engage in new venture, product and/or

service creation (Cunningham & Lischeron, 1991). Early contributions to the “Great Person” theory were provided by Richard Cantillion, who has been cited as the father of “Entrepreneurship” (Virtanen, 1997). Cantillion described entrepreneurs as those special independent developers who assumed uncertainty in the present with the expectation of a significant gain in the future. Thus, entrepreneurs were deemed to have special characteristics that allowed them to not only engage in calculated and uncertain risk designed to acquire additional resources, but also had to have the ability to increase the value of these resources and turn them into profit.

Through the years, researchers have looked at a variety of individual difference constructs designed to tap into these superior dispositions that distinguish entrepreneurs from others. For instance, individual difference characteristics related to creativity, autonomy, achievement motivation, leadership, opportunity recognition, venture evaluation, networking, locus of control, risk-taking, intuitive thinking, decision-making competency, seeing the market from an alternative angle, deal making, coping with uncertainty and ambiguity, intuition, honesty, adaptability to situations, opportunity identification, cooperativeness, career assessment, ethical behavior, and various components of the Big 5 personality taxonomy have all been reviewed as key indicators distinguishing entrepreneurs (Athayde, 2008; Begley & Boyd, 1987; Bird, 1988; Brockhaus, 1980; Caird, 1991; Cunningham & Lischeron, 1991; Davidsson, 1989; Eisenhardt, 1989; Izquierdo & Deschoolmeester, 2008; Kolvereid, 1996; Lindsay & Craig, 2002; Low & MacMillan, 1988; Schjoedt, 2009; Shane, 2000; Shaver & Scott, 1991; Smith, Gannon, Grimm, & Mitchell, 1988; Zhao & Siebert, 2006).

Despite the appeal of the personality-based approach to entrepreneurship, researchers have provided strong caution against the use of a personality approach to distinguishing

entrepreneurs (Ajzen & Fishbein, 1977; Bruyat & Julien, 2000; Gartner, 1989; Low & MacMillan, 1988; Robinson, Stimpson, Huefner, & Hunt, 1991; Shaver & Scott, 1991; Virtanen, 1997). For instance, Low and MacMillan (1988) argued that a primary weakness in using a personality-based approach to study Entrepreneurship lies in its inability to show that the personality characteristics that have been used to differentiate among entrepreneurs and non-entrepreneurs. Bruyat and Julien (2000) reasoned that if a researcher wanted to support a personality-based approach to Entrepreneurship, the onus is on the researcher is to show that the unique entrepreneurial characteristic is: 1.) *present* in *all* entrepreneurs, and 2.) *not present* in *any* non-entrepreneur. As expected, this has yet to be conclusively shown. As Shaver and Scott (1991) imply, even the most adamant proponent of personality-based differences between entrepreneurs and non-entrepreneurs would find it difficult to defend a conclusion that “a complete map of the human genome will reveal a specific gene that can separate new venture founders from everyone else” (p. 32). Despite noteworthy efforts, just as with leadership theories, entrepreneurship trait theorist have not been able to fully support a personality-based approach to entrepreneurship (Robinson et al., 1991).

### ***The Psychological Characteristics Theory of Entrepreneurship***

Similar to the “Great Person” theory of Entrepreneurship, the “Psychological Characteristics” theory of Entrepreneurship focuses on the individual and assumes that entrepreneurs carry advanced skills and attributes that drive and promote successful entrepreneurial behavior. Unlike the “Great Person” theory, these skills are not necessarily innate traits, but rather developed over time through cultural, social and environmental interactions (Cunningham & Lischeron, 1991). According to the “Psychological Characteristics” theory, the primary factors driving entrepreneurship are underlying psychological attitudes,

values, motivations and drives related to a need for power, recognition and acceptance (Cunningham & Lischeron, 1991).

The “Psychological Characteristics” approach to leadership has influenced a large body of literature designed to identify the critical attitudes and cognitive processes facilitating successful entrepreneurship (Athayde, 2008; Baron, 2002; Cunningham & Lischeron, 1991; Haynie & Shepherd, 2009; Gibb, 1993, 2002; Ireland, Hitt, & Sirmon, 2003; Izquierdo & Deschoolmeester, 2008; McCline et al., 2000; McGrath & MacMillan, 2000; Robinson et al., 1991; Timmons, 1994). For instance, Robinson et al. (1991) evaluated the effect of entrepreneurial attitudes related to achievement in business, self-esteem in business, personal control of business outcomes, and innovation in business as primary facilitators of Entrepreneurship. In seeking to identify the critical competencies related to Entrepreneurship, Izquierdo and Deschoolmeester (2008) surveyed both a sample of Ecuadorian entrepreneurs and a sample of international Entrepreneurship academicians to determine the core competencies vital to entrepreneurial success. In both samples, decision making, identifying and solving problems, identifying business opportunities, innovative thinking, evaluating business opportunities, communication, deal making and negotiation, and networking were all identified as psychological characteristics critical to entrepreneurial success. Finally, in their review of the “Psychological Characteristics” approach to Entrepreneurship, Cunningham and Lischeron (1991) discussed the importance of psychological characteristics such as work ethic, vigor, persistence, self-esteem, knowledge, judgment, tact, diplomacy, decisiveness, honesty, ethics, and need for achievement as critical psychological characteristics likely to influence the entrepreneurial success.



### *The Classical Entrepreneurship Theory of Entrepreneurship*

The “Classical” approach to Entrepreneurship assumes that the critical factor in understanding entrepreneurial success is not in the exploration of traits, attitudes or psychological characteristics, but rather in understanding the factors proximally facilitating actual entrepreneurial behaviors. Thus, the focus is not on the factors leading to idea development or entrepreneurial desire, but rather on the factors leading to engagement in innovative, creative and discovery entrepreneurial behaviors. As such, a major focus in the “Classical” approach to Entrepreneurship assumes that to understand the factors that lead to entrepreneurial behaviors, decision makers must look beyond specific attitudes and focus on individual, organizational, environmental and experiential factors that drive innovative, creative and discovery behaviors.

Low and MacMillian (1988) classified the shift from a personality-based approach to a more behavior-based approach to Entrepreneurship as representative of a strategic adaptation evaluation of Entrepreneurship. According to Low and MacMillian, the strategic adaptation movement assumes that “entrepreneurial success lies in the decision of the individual entrepreneurs who identify opportunities, develop strategies, and assemble resources and take initiative” (p. 142). Thus, the “Classical” approach to Entrepreneurship provides theoretical precedence for exploring the role of more proximal indicators of entrepreneurial behavior, such as judgment, decision making, technical knowhow and social and physical resources to determine what factors drive entrepreneurial behavior (Haynie & Shepherd, 2009; Low and MacMillian, 1988).

Building primarily off the “Classical” approach to Entrepreneurship, Haynie and Shepherd (2009) evaluated the importance of individual motivation, past knowledge, choices, experience and feedback on entrepreneurial behavior. The authors found that when

entrepreneurs had an approach-oriented goal orientation, advanced knowledge, prior experience and used the knowledge and lessons to inform future behavioral action, there was a greater likelihood of future entrepreneurial success. Similarly, sociological models of Entrepreneurship have also looked at specific ethnic, socioeconomic and geographic factors to determine what environmental factors distinguishing successful entrepreneurs. Factors including ethnic identification, disadvantaged backgrounds, social networks, geographic location, financial or social capital constraints, and life course stage have been evoked to understand what leads to entrepreneurial behavior and success (Kibas & K' Aol, 2004; Parker, 2004; Robinson et al., 1991; Virtanen, 1997). The shift from a focus on the individual traits and characteristics of entrepreneurs to the behavioral actions of entrepreneurs is consistent with this movement in the study of Leadership. The next few theories of Entrepreneurship will focus more explicitly on how entrepreneurs function as managers and leaders within an organization, as well as how their actions in these roles help to promote Entrepreneurship success.

### ***The “Management as Entrepreneurship” Theory***

The first three theories discussed focused on the individual attributes and innovative behaviors of the entrepreneur. The “Management” approach to Entrepreneurship evaluates how Entrepreneurship occurs as a process of managerial behaviors and decisions. Using the “Management” approach, Cunningham and Lischeron (1991) described the entrepreneur as “a person who organizes or manages a business undertaking, assuming the risk for the sake of profit (p. 51). Within any business relationship, managers hold the primary responsibility for planning, budgeting, coordinating projects and supervising the allocation of resources. Whether these activities are formalized or delegated to others within the group, the manager is responsible for overseeing that all tasks are completed properly.

In contrast to the earlier trait-like approaches to Entrepreneurship, the “Management” approach assumes that entrepreneurs can be formally trained in the classroom or work environment (Cunningham & Lischeron, 1991). Stevenson and Gumpert (1985) identified six managerial-based practices and policies associated with successful organizational Entrepreneurship. These included providing resources, being flexible, implementing rewards and providing independence and autonomy. Training sessions that teaches employees to think rationally and analytically through important business can be used to support organizational innovation behaviors. Developing a workforce in which these skills and policies are heightened and ingrained into the culture and fabric of how the organization functions can better prepare an organization to compete and succeed in Entrepreneurship.

### ***The “Leadership as Entrepreneurship” Theory***

The “Leadership” approach to Entrepreneurship assumes that an entrepreneur facilitates entrepreneurial success by exhibiting leadership skills and behaviors aimed at driving innovative, creative and discovery behaviors (Cunningham & Lischeron, 1991). Leaders play an active role in Entrepreneurship through their influence on followers. Leaders share primary responsibility for setting the vision, inspiration and motivation of followers, as well as providing direction, resources and feedback on the progress of innovative initiatives. As such, Kao (1989) suggested that the purpose of the leader as the entrepreneur is to define what can be achieved, inspire others to rally behind the vision, and engage them to work collaboratively in pursuit of the idea. Cunningham and Lischeron (1991) emphasized that the two most important skills a leader must have are 1.) the ability to get the task accomplished and 2.) the ability to effectively respond to, and understand the needs, of the followers. This requires that leaders adjust their leadership styles to fit the situation while providing followers opportunities to pursue innovation. In

addition, Lumpkin and Dess (1996) suggested that in the pursuit of Entrepreneurship, leaders must also have the ability to balance external and internal environmental factors. Specifically, when environmental opportunities are presented, effective entrepreneur leaders create pathways for innovation and discovery to succeed. Further, when fluctuations within the economic, political, industry and cultural environments limits the level of internal and external resources, entrepreneur leaders must be adept at redistributing resources, creating new resource pools, and finding ways to motivate and empower others to continue to exhibit entrepreneurial thoughts and behaviors.

Cunningham and Lischeron (1991) offered that when leaders are able to develop an organizational culture in which knowledge-, idea- and resource-sharing are hallmarks, organizational leaders have a greater likelihood of creating a coherent vision in line with the values and ideals of the organization. Similarly, Hornsby, Kuratko, and Zahra (2002) suggested that the implementation of internal policies, practices and procedures designed to provide followers with organizational resources, rewards, support and appropriate time to pursue innovation are all important leadership-based behaviors that can help facilitate entrepreneurship success. Just as with leadership-based theories, Pearce, Kramer, and Robbins (1997) suggested that managers and leaders are able to adopt entrepreneur focused-behaviors, reduce the effect of obstacles on innovation behavior, and stimulate others to try new ways of doing work. They can serve as a powerful force for initiating entrepreneurial, innovative and discovery behaviors.

### ***The “Intrapreneurship” theory of Entrepreneurship***

The final school of Entrepreneurship discussed by Cunningham and Lischeron (1991) is the “Intrapreneurship” approach. The “Intrapreneurship” approach represents “the development of independent units designed to create, market and expand innovative services, technologies, or

methods within the organization (p. 53). Accordingly, the “Intrapreneurship” approach is pursued by organizations as an effort to take advantage of their human capital competitive advantage, and to seek alternative ways to improve their market and service breadth, generate new market share and/or pursue greater economic profit.

The implementation of Intrapreneurship within an organization can be a difficult task. Wolcott and Lippitz (2007) discussed two key attributes that an organization must balance when attempting to encourage entrepreneurship among its workforce: personal ownership and resource authority. Personal ownership referred to the extent to which the entrepreneur was formally recognized as the person responsible and accountable for the innovation. Wolcott and Lippitz suggested that when personal ownership was formally recognized by the organization, Intrapreneurship had a higher likelihood of success. The second facet to consider when attempting to implement Intrapreneurship is resource authority. Resource authority referred to the extent to which the organization allocated funds specifically dedicated to a project. Similar to personal ownership, Wolcott and Lippitz suggested that when dedicated resources for the pursuit of innovative activities were formally recognized by the organization, Intrapreneurship had a higher likelihood of success.

Entrepreneurship is also shaped by organizational policies and practices, and the extent to which these factors facilitate or hinder innovative behavior. For instance, Cunningham and Lischeron (1991) discussed how the frustration and anxiety associated with feeling blocked, unsupported or minimized within a bureaucratic organization can inhibit innovation and increase intentions to pursue alternative employment. Similarly, other researchers have discussed the importance of buy-in from top level managers, directors and executives as critical to facilitating Entrepreneurship. Felton (1959) discussed the importance of top level board members and

executives having an innovative "state-of-mind". Similarly, Brazeal, Schenkel, and Azriel (2008) suggested that top managers play a top role in facilitating entrepreneurial behavior among their workforce by creating a corporate culture that rewards and encourages Entrepreneurship. Argyris (1966) offered that in order for Entrepreneurship to be successful, there must be consistency between what the organization values and what the organization does. Argyris implied that when an organization says it values entrepreneurship, but does not support entrepreneurial efforts, this sends a clear message throughout the organization regarding the overall importance of entrepreneurship as a core organizational competency. Alternatively, when top managers are open to new, innovative and creative ideas and are willing to accept change, this is likely to increase the innovative, creative and discovery efforts of their workforce.

In the end, the successful implementation of Intrapreneurship activities can provide an effective guard against organizational staleness and inertia (Thornberry, 2002). Similarly, Pearce et al. (1997) suggested that the adaptation of entrepreneurial-focused behaviors by organizations may also have a positive impact on organizational financial bottom line results and employee and customer satisfaction-related attitudes and perceptions. As Ellis and Taylor (1987) suggested, innovative behaviors within the organization can extend the organization's breadth of the products and services, and open up and revitalize new and existing markets. Both outcomes are likely to lead to an overall competitive advantage and greater financial profits.

The parallels between Entrepreneurship and Leadership calls into question the extent to which the constructs are unique. Cunningham and Lischeron's (1991) discussion of Entrepreneurship as Management and Leadership also raises concerns regarding the extent to which Entrepreneurship and Leadership are unique. Citing a variety of limitations associated with Entrepreneurship research, Vecchio (2003) suggested that Entrepreneurship is best considered a specialized case of Leadership. Specifically, Vecchio cited the symmetry of Entrepreneurship constructs that are consistent with Leadership related

constructs and the inability of the literature to offer conclusive evidence that Entrepreneurs are distinguishable from other employees. As a result, Vecchio suggested that Entrepreneurs, likely coaches and volunteer organizers, represented a specialized form of leaders. Cogliser and Brigham (2004) suggested that there are similarities between Entrepreneurship and Leadership, especially in relation to the similar focus of both constructs on individual vision, influence, creativity and planning and the models used to explore both constructs. Yet, citing Busenitz, West, Shepherd, Nelson and Chandler (2003), Cogliser and Brigham (2004) suggested that although leaders and their leadership behaviors are likely to play a critical role in the advancement of Entrepreneurship, the two constructs are likely distinct. This finding would be consistent with the conclusions offered by Cunningham and Lischeron (1991) in their discussion of the Management and Leadership approaches to Entrepreneurship. Thus, there appears to be legitimate arguments on both sides of the issue regarding the extent to which Entrepreneurship and Leadership are conceptually and empirically distinct. Additional research will play an important role in further validating the uniqueness of each construct.

Researchers have argued that the greatest contribution for understanding the factors facilitating Entrepreneurship is achieved when Entrepreneurship is evaluated as a state (Cogliser & Brigham, 2004; Vecchio, 2003). Similarly, Cunningham and Lischeron (1991) suggested that a greater understanding of the factors facilitating Entrepreneurship is can be derived when evaluated in context of managerial, leadership and instructional influences. Yet, meta-analytically, Rauch and Frese (2007) assessed the importance of individual personality variables on business creation and success. Yet, Rauch and Frese found that personality traits that were indicative of successful business operation, including need for achievement, generalized self-efficacy, innovativeness, stress tolerance, need for autonomy, and proactive personality were indicative of successful business operation, were also significantly related to business creation (corrected  $r = .25$ ) and success (corrected  $r = .25$ ). Collectively, these findings suggest that both

trait and state variables play an important role in determining the factors facilitating successful Entrepreneurship.

Although each of the six schools of Entrepreneurship provide important information relative to the various inputs facilitating Entrepreneurship, the current study draws primarily from the Psychological Characteristics and Classical approaches to Entrepreneurship. Both approaches speak to the importance of characteristics that could be considered slightly dispositional (e.g. judgment, values) and situational (e.g., experience, decision making) as significant factors facilitating behavioral engagement in innovative, creative and discovery behavior (Cunningham & Lischeron, 1991). The next section discusses Entrepreneurial Orientation and its dimensions. In addition, a more detailed discussion of SJTs and how they can be used to evaluate Entrepreneurial Orientation will be reviewed.

## **Chapter 2 - Entrepreneurial Orientation**

Over the years, researchers have employed multiple methodologies aimed at identifying the critical characteristics that are essential to new venture and entrepreneurship success. To varying degrees of success, attitude-, behavioral-, cognitive-, and competency-based approaches have been developed to measure the qualities important to successful entrepreneurship and business creation (Athayde, 2008; Gregoire, Corbett, & McMullen, 2011; Haynie & Shepherd, 2009; Izquierdo & Deschoolmeester, 2008; Lumpkin & Dess, 1996; Lyon, et al., 2000; Lumpkin, Cogliser, & Schneider, 2009; McCline et al., 2000; Robinson et al., 1991; Smith, Mitchell, & Mitchell, 2009). One construct that has attained considerable support as critical in understanding the personal skills that are important to successful business creation is Entrepreneurial Orientation (Lumpkin & Dess, 1996; Lyon et al., 2000).



Lumpkin and Dess (1996) defined EO as “the processes, practices, and decision-making activities that lead to new [market or venture] entry” (p. 136). Further, they conceptualized Entrepreneurial Orientation as consisting of three primary dimensions: Proactiveness, Innovativeness and Risk-Taking. Proactiveness refers to the “forward looking, first-mover advantage-seeking effort to shape the environment by introducing new product or processes ahead of competition” (Lyon et al., 200, p. 1056). Innovativeness represents the “tendency to engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, service, or technological processes” (Lumpkin and Dess, 1996, p. 142). Risk-Taking includes “borrowing heavily, committing a high percentage of resources to projects with uncertain outcomes, and entering [and investing in] unknown markets” (Lyon et al., 2000, p. 1056).

Historically, Entrepreneurial Orientation has been measured as an organizational level construct. At the organizational level, Entrepreneurial Orientation is often determined by evaluating the behaviors and practices set forth by organizational management as a measure of its commitment to Entrepreneurial Orientation. Organizations that formally dedicated time, resources, and incentives designed to promote proactive, innovative, and risk-taking behaviors were determined to be entrepreneurially-oriented (Lumpkin & Dess, 1996; Lyon et al., 2000).

Yet, little research has been conducted on Entrepreneurial Orientation as an individual competency. For instance, measures of Entrepreneurial Attitude (Athayde, 2008), Entrepreneurial Self-Efficacy (McGee, Peterson, Mueller, & Sequeira, 2009), and Cognitive Adaptability (Haynie & Shepard, 2009), are often developed and promoted as measures of some dimension of entrepreneurial propensity. Often, a review of the items used in the development of these scales suggests that these measures better assess characteristics that are antecedents or

outcomes of Entrepreneurial Orientation, rather than Entrepreneurial Orientation specifically. This research attempts to address this void in the literature by developing a measure to evaluate the dimensions of Entrepreneurial Orientation using an SJT testing methodology.

### **The Dimensionality of Entrepreneurial Orientation**

The dimensionality of Entrepreneurial Orientation continues to be of interest to researchers. Over the years, Entrepreneurial Orientation has been conceptualized in a diverse number of ways and along a variety of dimensions. Miller and Friesen (1978) suggested the presence of eleven strategic decision making dimensions as indicative of Entrepreneurial Orientation. These ranged from adaptiveness and analysis to risk-taking and product and marketing innovation. Fredrickson (1986) suggested proactiveness, rationality, comprehensiveness, assertiveness, and risk-taking as characteristics representative of an Entrepreneurial Orientation. Similarly, Sexton and Bowman (1985) suggested ambiguity, risk propensity, comfort in changing situations, and need for autonomy. Other characteristics that have been cited as indicative of entrepreneurs include need for achievement, persistence, self-confidence, voluntarism, opportunism, uncertainty-bearing, intuition, thinking ability, self-confidence, and a reduced need for security (Bouchikhi, 1993; Chell, Harworth, & Brearley, 1991; McClelland, 1985; Sathe, 2003; Scherer, 1982; Stopford & Baden-Fuller, 1994).

Following these early efforts, Covin and Slevin (1989) circulated perhaps the most widely accepted dimensional structure of Entrepreneurial Orientation (Knight, 1997; Kreiser, Marino, & Weaver, 2002; Miller, 1983; Lumpkin & Dess, 1996; Lyon et al., 2000; Stewart, 2009; Wiklund, 1999; Wiklund & Shepherd, 2005; Zahra, 1991). According to Covin and Slevin, Entrepreneurial Orientation is best viewed as consisting of Proactiveness, Innovativeness, and Risk-Taking dimensions. Subsequent work by Lyon et al. (2000) augmented the

Entrepreneurial Orientation construct by adding Competitive Aggressiveness and Autonomy to the existing list. Lumpkin and Dess (1996) defended the inclusion of Competitive Aggressiveness by focusing on early work conducted by Miller (1983), which suggested the importance of “beating competitors to the punch” and “intensity and head-to-head posturing” as critical elements of an entrepreneurial firm (p. 139). Similarly, Lumpkin and Dess (1996) suggested that organizational bureaucracy, in addition to archaic leadership models that deemphasize the importance of innovative, creative and discovery behaviors, was likely to impede new market entry and organizational renewal. Lumpkin and Dess reasoned that to promote continuous entrepreneurial behaviors, key leaders needed to encourage creativity among individuals, freedom and flexibility in pursuing opportunities, and independent, free, and purposeful behavior. As a result, Autonomy was also assumed to be an important component of Entrepreneurial Orientation. Despite the contributions of Lumpkin and Dess (1996), little research has been conducted to validate the inclusion of Competitive Aggressiveness and Autonomy as components of the Entrepreneurial Orientation construct. As a result, the current study will focus specifically on Entrepreneurial Orientation as a tri-dimensional construct consisting of Proactiveness, Innovativeness and Risk-Taking dimensions. In the next section, each of the three Entrepreneurial Orientation dimensions will be discussed in greater detail.

## **Entrepreneurial Orientation Dimensions**

### ***Proactiveness***

Proactiveness reflects initiative in the entrepreneurial process. Proactiveness serves an important function for entrepreneurs in that it encompasses the vision and imagination that is needed to pursue market opportunities (Lumpkin & Dess, 1996). Lyon et al., (2000) defined Proactiveness as “forward looking, first-mover advantage-seeking effort to shape the

environment by introducing new product or processes ahead of competition” (p. 1056). When successful, Proactiveness leads to more effective adaptation and can create competitive and economic advantage (Jauch & Glueck, 1988).

Miller and Friesen (1978) suggested that Proactiveness can be evaluated by determining the extent to which an action either shapes or reacts to the environment. Proactive behaviors represent those creative and discovery behaviors designed to identify environmental opportunities and achieve first-mover competitive advantage. In the pursuit of proactive behavior, entrepreneurs often must shape and create markets and opportunities. Shaping and creating new markets may require upstart entrepreneurs to show flexibility and creativity in their thinking, resource deployment and implementation practices. Thus, upstart entrepreneurs must oftentimes utilize unconventional and novel methods to compete (Lumpkin & Dess, 1996).

Knight (1997) discussed a proactive orientation in the context of its level of aggressiveness towards either the market or competitors. According to Knight, a market-oriented proactive strategy does not rely on opportunities within the market to present themselves organically, but rather engages the market to create opportunities. Thus, those possessing a market-oriented proactive orientation engage in anticipative, opportunity-seeking, forward-looking behaviors that allow for the creation and exploitation of environmental opportunities (Lumpkin & Dess, 1996; Sandberg, 2002). These forward-looking and advantage-seeking initiative behaviors allow proactive entrepreneurs to notice, pursue, and meet the demands of established, niche, and underserved markets. Alternatively, a competitor-oriented proactive approach is one in which competitive positioning is attained through the identification and exploitation of weaknesses in industry competitors. Rather than engaging the market to create opportunities, a competitor-oriented strategy attempts to use aggressive and bold

behaviors to force their competitors to pursue potentially unstable strategies, or risk losing market share.

Lumpkin and Dess (1996) suggested that Proactiveness does not imply that the strategies, processes or services implemented to engage the market or competitors have to be novel. In fact, imitative proactive strategies in which successful processes utilized by other organizations are imitated or improved to address the needs of an underserved niche provides a particularly useful strategy for many existing and start-up organizations. Further, when an entrepreneur can anticipate potential deficiencies, flaws or threats to current products or processes and develop modifications to reduce weaknesses, this forward-looking, advantage-seeking behavior can once again result in greater competitive advantage and increased market share (Lumpkin & Dess, 1996; Miles & Snow, 1978).

### ***Innovativeness***

Innovation provides one of the primary themes underlying both internal and external entrepreneurship (Covin & Miles, 1999). Innovativeness refers to the “tendency to engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, service, or technological processes” (Lumpkin & Dess, 1996, p. 142). An innovative orientation is not specific solely to the introduction of new products. Lussier, Sonfield, Greene, Corman, and Frazer (1998) stated that an innovative orientation describes the range of processes impacting design technology, manufacturing processes, distribution channels, and/or promotional strategies that are implemented to improve organizational efficiency and productivity effectiveness. Similarly, Sawhney, Wolcott, and Arroniz (2006) discussed Innovativeness as more than just new product development, but as also broadening the breath of the construct to include innovations in services, channels, brands, etc.

Innovativeness occurs along a continuum ranging from simple, planned, funded and controlled innovations (incremental innovation), to more spontaneous innovations that occur dynamically and are characterized by a reduced level of funding and control (radical innovation) (Burgelman, 1983). Incremental innovations are those that occur as a result of active planning. Products developed using an incremental innovative approach are slowly implemented and introduced to the market. These products are generally consistent with the current product line and internal strategic posture. Alternatively, radical innovations are less common and often occur upon entry into an industry. Radical innovations often occurs as a result of discovering that the organization can fulfill a niche market by implementing minor alterations in its current processes or resource allocation,

Organizations are most likely to have the necessary capital to invest in research and development programs to promote technological innovations. Yet, both organizations and the individual entrepreneur can effectively compete through an emphasis on creating innovation solutions to improve product design, product development, marketing strategies and promotion of current and novel products. Lumpkin and Dess (1996) suggested that in the end, whether innovations are radical or incremental, both methods cause disruption within a stagnant and complacent market and can lead to sustainability, competitiveness and wealth creation.

### ***Risk-Taking***

Lyon et al. (2000) defined Risk-Taking as “borrowing heavily, committing a high percentage of resources to projects with uncertain outcomes, and entering [and investing in] unknown markets” (p. 1056). The risk-averse individual prefers to engage in careful study, deliberation and investigation of an opportunity prior to making a decision. In contrast, the risk-

taker is inclined to engage business-related uncertainty in a less calculated and more spontaneous manner (Brockhaus, 1980; Kreiser, et al., 2002).

Early research on Risk-Taking assumed that people have a natural propensity to be risk averse (Ross, 1987). Most often, Risk-Taking is pursued primarily upon entry into a market, or when the pressures of maintaining a status quo strategic orientation threatens a critical market share. Effective Risk-Taking, whether high or low, is often characterized by a modest level of calculation. Even among those who are considered to be high risk-takers, risk is pursued primarily based on whether the assumption of risk is likely to lead to short-term or long-term gains, or necessity, rather than an innate desire (Das & Teng, 1997).

Baird and Thomas (1985) differentiated between three types of risk that entrepreneurs encounter. These were labeled: venture into the unknown, committing assets, and borrowing heavily. Similarly, other authors, such as Liles (1974) and Saracheck (1978) suggested that risk not only involves financial risk, but also may have consequences to one's career, family relationships, and personal and psychological well-being.

Large corporations spend significant sums of money hiring PR firms, donating to charities and promoting themselves as something more than large, greedy, opportunistic corporations that are solely focused on the bottom line. Similarly, young start-ups often attempt to differentiate themselves by emphasizing the extent to which they incorporate social, cultural and ethical norms and values into their product development and marketing practices. Whether established, maturing or a new-entry, maintaining a favorable reputation with one's consumer is vital to effectively compete. Although financial risk-taking behavior is likely to be a more traditional indicator of entrepreneurial success, multiple risk dimensions have associated positive and

negative personal, social, and psychological outcomes and are likely to play an important role in understanding how Risk-Taking functions as a primary indicator of Entrepreneurial Orientation.

### ***Entrepreneurial Orientation as an Individual-Level Construct***

Entrepreneurial Orientation has been studied in many diverse ways (Lumpkin & Dess, 1996; Lumpkin et al., 2009; Lyon et al., 2000; Stewart, 2009); with a majority of these occurring at the firm-level of analysis. Covin and Slevin's (1989) measure of Entrepreneurial Orientation is purely intended to evaluate the forward thinking, innovative and risk-taking policies, practices and behaviors of organizational management as a basis for understanding entrepreneurial orientation. Research by Hornsby and colleagues (e.g., Hornsby et al., 2002, Hornsby, Naffziger, Kuratko, & Montagno, 1993; Hornsby, Kuratko, & Montagno, 1999; Kuratko & Hornsby, 1998) has looked at Entrepreneurial Orientation in the context of organizational policies, regulations and organizational resources and structure as a method to encourage Entrepreneurship. Lumpkin and Dess (1996), Knight (1997) and Lyon et al. (2000) also have discussed and measured Entrepreneurial Orientation as an organizational-level construct that is primarily influenced by critical factors within the context of the organization's work environment, procedural policies and top management behaviors.

Relatively few studies have examined these effects at the individual level. An exception includes dissertation research conducted by Stewart (2009), who evaluated Proactiveness, Innovativeness, and Risk-Taking as antecedents (rather than indicators) of Entrepreneurial Orientation among frontline internal organizational entrepreneurs. Robinson et al. (1991) evaluated Entrepreneurial Orientation using an attitude-based approach and specifically looked at its relationship to the development of entrepreneurial intentions. More recently, researchers have looked at any likely modest correlates of Entrepreneurial Orientation, such as Enterprise Potential (Athayde, 2009), Cognitive Adaptability (Haynie & Shepherd, 2009), Entrepreneurial



Scripts (Smith et al., 2009), and Entrepreneurial Self-Efficacy (McGee et al., 2009). Each of these studies has provided important insight regarding the characteristics central to understanding the personal factors that are critical to Entrepreneurship. In addition, most of these studies use an attitude-, interest- or personality-based approach to evaluating entrepreneurship and understanding what traits and dispositions are most likely representative of entrepreneurs. Few of these studies have linked their findings to the tri-dimensional Proactiveness, Innovativeness and Risk-Taking model of Entrepreneurial Orientation. Having discussed the construct of Entrepreneurial Orientation, its dimensionality and the extent to which Entrepreneurial Orientation can be measured as an individual-level construct, in the next section the research will evaluate the extent to which Entrepreneurial Orientation is state-like and open to development.

### ***Entrepreneurial Orientation Dimensions as State Variables***

Although typically viewed as personality characteristics, research has shown that the dimensions of Entrepreneurial Orientation are state-like and open to development. Researchers have suggested that external and internal factors related to the economic, political, competitive, and social environments were assumed to influence the acquisition and availability of resources needed to be entrepreneurially-oriented (Boyatzis, 2008; Lumpkin & Dess, 1996). In addition, internal factors relative to the organizational culture, organizational reward structure, managerial support, organizational leadership, strategic posturing, time availability, organizational formalization and centralization, and interpersonal connectedness have all being found to significantly impact Entrepreneurial Orientation (Boyatzis, 2008; Brazeal, Schenkel, & Azriel, 2008; Hornsby et al., 2002; Wolcott & Lippitz, 2007; Lyon et al., 2000; Zaltman, Duncan, & Holbek, 1973).

Izquierdo and Deschoolmeester (2008) noted that academic training courses needed to focus on helping students to develop their personal abilities to identify business opportunities, think innovatively, evaluate business opportunities, problem solve, and make deals and negotiate within its curriculum. Similarly, Athayde (2008) sought to determine the effect of participation in a Junior Achievement program in the UK on the development of positive Entrepreneurship attitudes among a sample of 15-19 year old students. Athayde found that students who participated in the program showed higher levels of leadership, personal control, creativity, achievement, and work ethic, and, in general, more positive attitudes towards self-employment. Haynie and Shepherd (2009) assumed that the development of entrepreneurial competency evolved over time as a result of personal motivation, acquired knowledge and experience and self-regulation through feedback. According to Haynie and Shepherd, entrepreneurs are able to effectively integrate knowledge, experience and feedback from previous decisions to create a more exhaustive and complete list of options when faced with a challenging situation. As a result, entrepreneurs can efficiently utilize this information to develop and implement adaptive strategies to circumvent environmental pressures and threats.

Collectively, these research findings suggest that the critical entrepreneurial characteristics are not trait-like and innate, but rather highly influenced by critical contextual factors. Thus, although it is likely that each of the Entrepreneurial Orientation dimensions is influenced by genetics, there are reasonable arguments suggesting that training and development programs, knowledge, and experiences designed to enhance these abilities also play a meaningful role. Having discussed the construct of Entrepreneurial Orientation, its dimensionality and the extent to which Entrepreneurial Orientation is a state-like and developmental construct, the next section will focus more specifically on how the SJT testing methodology was used to develop

items reflecting the Proactiveness, Innovativeness and Risk-Taking dimensions of Entrepreneurial Orientation.

## **Chapter 3 - Situational Judgment Test**

### **Situational Judgment Tests (SJT) Methodology**

SJT items assess future-oriented behavior in a work-related context. A situational judgment test (SJT) testing methodology assumes behavioral consistency across settings and are designed to assess future-oriented behavior in a work-related context through the assessment of past behavior (Whetzel & McDaniel, 2009). Accordingly, individual responses on SJT items are assumed to provide critical insight into the past, present, and future judgment and decision making characteristics of the respondent. The administration of an SJT test involves presenting respondents with work-related scenarios and asking them to select or rank the response option that is best, or most effective to resolve the problem. Individual responses on SJTs are thought to project individual personality, interests, values, judgment, decision making and other personal characteristics (Motowidlo, Dunnette, & Carter, 1990; Motowidlo, Hooper, & Jackson, 2006; Weekley & Ployhart, 2006; Whetzel & McDaniel, 2009).

The use of SJTs as a method to distinguish among people in employment and school-related contexts dates back to the late 19<sup>th</sup> century and early 20<sup>th</sup> century. During this time, governmental agencies such as the Trade-Marks and Patents Office utilized SJTs to select civil service workers. In the educational setting, Binet also implemented the use of SJT-based testing to evaluate intelligence in children (Whetzel & McDaniel, 2009). Later, during the WWII era, Army researchers began utilizing the SJT format to assess soldier judgment, common sense, experience, and general knowledge to make decisions about selecting, training and placement

(Whetzel & McDaniel, 2009). Following WWII, the popularity of the SJT methodology as a tool to improve personnel selection of organizational supervisors and managers dramatically increased (Bruce & Lerner, 1958; Campbell, Dunnette, Lawler, & Weick, 1970; Motowidlo et al., 1990; Whetzel & McDaniel, 2009). For instance, Cardall (1942) noted that in the 1940s, an SJT measure labeled the Practical Judgment Test was used to evaluate supervisory potential. Similarly, Campbell et al. (1970) discussed the inclusion of SJTs in the selection and promotional settings as a method to explore and predict managerial success.

Today, SJTs remain an important low-fidelity selection tool to aid in making decisions about entry-level employment. Whetzel and McDaniel (2009) conclude that their popularity remains stable because SJTs have been shown to reduce adverse impact in selection, reduce subgroup differences within gender and ethnic groups, and are generally seen to be face valid. As a result, they are seen as helpful in reducing applicant dissatisfaction with the selection process (Chan & Schmitt, 1997; McDaniel, Bruhn-Finnegan, Morgeson, Finnegan, Campion, & Braverman, 2001; Salgado, Viswesvaran, & Ones, 2001; Weekley & Jones, 1999; Weekley & Ployhart, 2005; Whetzel & McDaniel, 2009; Whetzel, McDaniel, & Nguyen, 2008).

In terms of their ability to predict critical organizational behaviors, research has supported the use of SJT as an effective selection for a variety of reasons. First, multiple studies have suggested the significant relationship between the SJT methodology and its ability to predict performance (McDaniel, et al., 2001, McDaniel, Hartman, Whetzel, & Grubb, 2007; McDaniel & Nguyen, 2001; Weekley & Ployhart, 2005; Salgado et al., 2001). For instance, in their sample of managerial candidates at seven different companies, Motowidlo et al., (1990) reported validity coefficient values ranging from 0.20 to 0.40 when evaluated in relation to job performance. Similarly, Mumford, van Iddekinge, Morgeson, and Campion (2008) used the SJT

methodology to develop the “Team Role Test” and found that the measure correlated at .34 with team role performance. Across a variety of meta-analytic studies, researchers have also found that the SJT methodology has a significant relationship with a variety of performance-based outcomes (Motowidlo et al., 1990; Motowidlo et al., 2006; Whetzel & McDaniel, 2009).

A second contribution of the SJT methodology is its ability to predict performance above and beyond more traditional testing methodologies, such as cognitive ability and personality measures of the same construct. McDaniel and colleagues (McDaniel et al., 2001, McDaniel et al., 2007) found that not only did the SJT methodology share a significant relationship with both cognitive ability (mean  $r = 0.29$ ) and the Big 5 personality dimensions (mean  $r$ 's ranging from .11 to .23), but that the use of an SJT methodology also provided incremental predictive validity of performance-related outcomes above and beyond the cognitive ability and personality measures. Consistent findings have been supported in the SJT literature by Chan and Schmitt (2002), who evaluated the predictive nature of an SJT test on both task and contextual performance using a sample of civil service employees. Results of the study showed that the SJT test not only predicted the performance dimensions, but also that the SJT provided an incremental increase in the prediction of the performance outcomes above cognitive ability, Big Five personality and work experience. Similarly, O'Connell, Hartman, McDaniel, Grubb, and Lawrence (2007) evaluated the incremental validity of SJT above and beyond both cognitive ability ( $\Delta R^2 = .03$ ) and personality ( $\Delta R^2 = .04$ ) on task performance alone. For contextual performance, the SJT yielded an incremental validity above cognitive ability ( $\Delta R^2 = .04$ ), but failed to yield a significant incremental increase above personality.

A final advantage of the SJT is its ability to assess individual characteristics that are as diverse as individual preferences, values, temperament, abilities, orientations, intentions and/or

skills that are open to development Whetzel & McDaniel, 2009). Unlike a personality-based profile, which assumes that individual characteristics are innate and genetic, the competencies measured using an SJT methodology are readily influenced through intervention. Similarly, when contrasted with an attitude-based methodology, an SJT methodology provides a more proximal indicator of behavior than an attitude. According to the Theory of Planned Behavior (Ajzen, 1991), attitudes represent an intention or motivation to behave in a specific manner and their effect on behavior is mediated by a number of intermediary processes, including personal experience.

SJTs provide a highly adaptable testing methodology that can be structured to evaluate both stable, trait-like (e.g., personality, values) and more malleable, state-like (e.g., judgment, decision making) characteristics (Motowidlo, Dunnette, & Carter, 1990; Motowidlo, Hooper, & Jackson, 2006; Weekley & Ployhart, 2006; Whetzel & McDaniel, 2009). In the current research, the SJTs scenarios were structured to represent relevant Entrepreneurship-related situations representative of Independent Entrepreneurship. In addition, the response options were designed to reflect more knowledge and experience-based solutions related to Cash Flow Management, Staffing, Exit Strategy, Partnerships, Marketing, Advertising and Pricing. By designing SJTs to evaluate decision making and judgment based on knowledge and experience, rather than personal dispositions, SJTs can be used to evaluate state-like characteristics that although are behavioral consistent across time, are also motivated and influenced through training, experience and acquired knowledge.

In sum, when properly developed, the SJT methodology provides a number of advantages over more traditional personality, interest, and attitude methodologies. Specifically, the SJT methodology reliably and validly captures meaningful information about one's past behaviors to

inform the prediction of future behavior. In addition, SJTs predict performance beyond more traditional measures of personnel selection and measures attributes that can be developed through intervention. Taking into account these advantages provides a rationale for using an SJT testing methodology to assess Entrepreneurial Orientation. In the next section, the study will focus on the methods used to develop an SJT-based measure of Entrepreneurial Orientation, labeled the Entrepreneurial Orientation Profile Inventory (EOPI). In particular, a focus on how SJT items were developed to assess the Proactiveness, Innovativeness and Risk-Taking dimensions of the Entrepreneurial Orientation construct will be addressed.

## **Chapter 4 - Entrepreneurial Orientation Profile Inventory (EOPI) Development**

Theoretical contributions for using judgment to evaluate Entrepreneurial Orientation can be rooted in theories of metacognition. Guterman (2002) defined thinking metacognitively as the ability to be “self-aware, to think aloud, to reflect, to be strategic, to plan, to have a plan in mind, to know what to know, to self-monitor” (p. 285). As such, metacognitive theories assume that human behavior and expertise shape their overall experience and develops their ability to adapt to uncertainty Haynie & Shepherd, 2009; Schraw & Moshman, 1995). Schraw and colleagues (Schraw & Dennison, 1994; Schraw & Moshman, 1995), suggested that those who are metacognitively adept are also better able to: 1) recognize and develop a broader list of effective solutions to a problem; 2) select the most efficient action from this set of alternative solutions; and 3) use feedback from past decisions to modify their decision making processes in future situations.

Haynie and Shepherd (2009) used metacognitive theory to explore how entrepreneurs use cognitive adaptation to identify opportunities and engage in entrepreneurial behaviors. According to Haynie and Shepherd, cognitive adaptability represented “the ability to be dynamic, flexible, and self-regulating in one’s cognitions given dynamic and uncertain task environments” (p. 695). In the study, Haynie and Shepherd identified dispositional, experiential, cognitive and motivational factors as individual difference characteristics facilitating entrepreneurial judgment, behavior, and success. The current research seeks to draw upon metacognitive and cognitive adaptability theories to develop a judgment-based measure of Entrepreneurial Orientation.

Developing SJT scenarios to test the full range of experiential and metacognitive components of the theory would require developing long and complex case studies. Further, assessing the dispositional and cognitive components of entrepreneurial orientation is likely to reduce the utility of the measure for decision makers. Specifically, dispositions are innate, long-term, enduring characteristics that are relatively stable across situations and time. As such, exploring the impact of dispositional traits provides little value to organizations seeking to identify and develop these skills within a population. Further, as discussed prior, trait-based research designed to identify the innate characteristics that uniquely distinguish entrepreneurs from others has generally received low to modest support in the literature. Similarly, research has shown that cognitive ability tends to be a relatively strong, enduring and long-term factor that is highly genetic and very loosely influenced by environmental forces. Thus, attempting to distinguish entrepreneurs on the basis of traits or cognitive ability is not a primary focus of the current research.



However, attempting to determine how personal experience and judgment influences the development of Entrepreneurial Orientation may be more impactful and meaningful to decision makers. As emphasized in theories of metacognition, experiences influence judgment and decision making by shaping the way an individual processes and frames a situation, and creates a list of reasonable alternatives to resolve the situation (Haynie & Shepherd, 2009; Schraw & Moshman, 1995). Haynie & Shepherd concluded that those who focus on the lessons learned from past experiences, acquired knowledge, and the outcomes of previous choices are better able to recognize and develop multiple alternatives to resolve an issue and, as a result, choose a more optimal solution. Schraw and Moshman (1995) argued that the failure to integrate knowledge, experiences and choices into a decision-making framework is likely to result in the loss or underdevelopment of many skills that are critical to performance. One way in which knowledge can be acquired and developed is through previous experience across time and situations (Kuhn, Schauble, & Garcia-Mila, 1992; Schraw & Moshman, 1995).

These findings suggest that because both knowledge and judgment can be impacted by personal experiences both inside and outside of the classroom setting, metacognitive and adaptive judgment can be developed. As a result, teaching workers and/or students to actively integrate their past experiences, acquired knowledge and previous decisions to determine how to think and act in a Proactive, Innovative and Risk-Taking manner provides utility for decision makers. As a result, the development of the EOPI SJT items being used to evaluate Entrepreneurial Orientation will focus more on the judgment-based abilities and skills of students to determine how these developmental characteristics provide insight into the identification and measurement of individual Proactiveness, Innovativeness and Risk-Taking.

### ***Situational Judgment Test (SJT) Entrepreneurial Orientation Item Development***

Bledow and Frese (2009) suggested that the development of SJT items should begin with the identification of critical incidents that reflect important situations encountered within a work-related setting. Further, Bledow and Frese suggested that using both experts and theory to help identify critical incidents, construct items, and to construct and rate appropriate response options is likely to improve the quality of a testing instrument. However, in the absence of experts, Whetzel and McDaniel (2009) concluded that the use of theory can provide an alternative methodology for developing test items.

For the current research, a theoretical approach was used to develop the test items and their associated response options. Themes for the EOPI SJT items were extracted from recent research material identifying critical themes and issues facing entrepreneurs and the field of Entrepreneurship. In particular, research findings by Schjoedt (2009), who provided a well-developed list of entrepreneurial tasks that and behaviors in which entrepreneurs regularly engage. These included: conceptually developing the business venture, conducting marketing research and marketing activities, creating the organization, developing customer relationships, developing products and services, selling the products and services, acquiring and managing resources, solving problems with products, services, operations, suppliers, customers, and others, and conducting the daily work functions of employees as needed.

Similarly, Balan and Lindsay (2009) provided a recent review of key factors influencing Innovation and Entrepreneurial Orientation in the Australian hotel industry. The report identified activities related to resource constraints, time pressure, competition, governmental regulations, environmental awareness, knowledge of trends, networking and alliances, strategic planning, financial and human capital, and service monitoring as meaningful issues impacting Entrepreneurship and Innovation. Based on these articles, in addition to a review of Business-

and Entrepreneurship-related textbooks, news programs, websites, and personal discussion with Entrepreneurs, a list of 30 critical incident work-related situations were identified for development into potential SJT items to be included in the EOPI measure.

Following the development of the 30 items, the list of critical incidents was reviewed and a decision regarding its inclusion or exclusion was made based primarily on how effective the test developer felt that an effective SJT scenario could be created from the incident. Following the review and selection of critical incidents, a total of 18 incidents remained and were used to develop scenarios to be included on the EOPI measure. For these 18 critical incidents, business-related scenarios integrating important judgment-based conflicts and inconsistencies that entrepreneurs face during the start-up, growth and maturation process of an enterprise were developed. In addition, these scenarios also attempted to introduce environmental, staffing, financial, marketing and strategic conflicts and inconsistencies into each scenario. Following the development of the scenarios, the 18 scenarios were informally reviewed and evaluated by the researcher's major professor and 2 independent Psychology graduate student reviewers. Specifically, each scenario was evaluated for the extent to which it was representative of a Proactive, Innovative or Risk-taking orientation. Based on the feedback received by these reviewers, modifications were made to items to address the concerns identified and to more clearly delineate each to reflect its associated Proactiveness, Innovativeness or Risk-Taking dimension.

Next, response options were developed for each SJT scenario. Bledow and Frese (2009), argued that when an SJT is developed to measure a specific behavior construct, "response options of one item need to represent different levels of the same construct, not entirely different constructs" (p. 238). Noting past research that had developed SJT response items to reflect an

underlying construct continuum (e.g., Trippe & Foti, 2003, Ployhart & Ryan, 2000; Beauregard, 2000), four response options were developed for each item. For every item, the four response options were developed to range from a mild to intermediate to high to extreme level of the construct.

As with the development of the SJT scenarios, each response option took into account various levels of knowledge, experience, and previous choice that would have to be considered in making a decision. In particular, a variety of textbooks related to Entrepreneurship (Zimmerer & Scarborough, 2008), Small Business Management (Scarborough, Wilson, & Zimmerer, 2009) and Strategic Management (Gamble & Thompson, 2009) were reviewed to develop potential response options for each scenarios. Guidelines for the development (and progression) of each response options were as follows:

***Response option 1:*** Designed to reflect a slightly conventional response characterized by a mild level of initiative, originality, or risk

***Response option 2:*** Designed to reflect a conventional response characterized by an intermediate level of initiative, originality, or risk

***Response option 3:*** Designed to reflect an unconventional response characterized by a high level of initiative, originality, or risk

***Response option 4:*** Designed to reflect an extremely unconventional response characterized by an extreme level of initiative, originality, or risk

To aid in identifying where each response option lies on the continuum, each of the 4 response options was assigned a numerical value. The mild response option was assigned a numerical value of 1, the intermediate response option was assigned a value of 2, the high

response option was assigned a value of 3 and the extreme response option was assigned a value of 4.

Following the development of the response options, each of the items was informally reviewed by the major professor and feedback was provided to improve the extent to which the four response options lie on the underlying continuum. In addition, three Masters-level graduates (one with a Masters in Business Administration, one with a Master's in Industrial/Organizational Psychology, and one with a Master's in Community and Regional Planning), were asked to evaluate each of the 18 scenarios and provide feedback on the grammar, punctuation and the effectiveness of the response options as they related to the underlying a priori mild-to-extreme continuum (see Appendix A to review the instructions to the graduate students, a sample SJT item and the associated rating scale used by the graduate student reviewers). The overall ratings provided by the graduate students were used to select 12 items to be included in the final survey. The scenarios receiving the highest overall ratings were modified to improve their overall clarity, and their associated response options were revised to better reflect the underlying a priori continuum progression. Upon modifications, these items were once again reviewed by the major professor and selected for inclusion in the final survey. As a result, the final EOPI measure included 12-SJT items. Four items were designated to evaluate Proactiveness, 4 items were designated to evaluate Innovativeness, and 4 items were designated to evaluate Risk-Taking. To reduce an order effect, in the final survey, the response items were randomized (see Appendix B to review each of the 12 EOPI SJT items and see Appendix C to review the randomized order of the response options for each item).

Following the development of the EOPI items and response options, measures were developed to aid in the evaluation of the construct and criterion validity of the EOPI measure. In particular, an

effort was made to include biographical data (biodata) items (in addition to more traditional psychological measures) to evaluate the construct and criterion-validity of the EOPI measure. In the following, a discussion of biodata items and their selection as a criteria variable will be discussed.

### ***Biographical Data (Biodata) Criterion Item Selection***

#### ***Biographical Data (BIODATA) Methodology***

A key factor in verifying the psychometric properties of the EOPI is the extent to which the measure is associated with, or can predict, entrepreneurial behaviors. In the current study, biodata items will be used to aid in the evaluation of the criterion validity of the EOPI measure. The utility of biodata as an effective testing methodology is highly influenced by its development. Mael (1991) identified ten attributes that were likely to improve respondent accuracy on biodata items: grounded in history, external, objective, firsthand, discrete, verifiable, controllable, equal access, job relevant, and non-invasive. When biodata items shared these characteristics, the ability and motivation for respondents to fake their responses are reduced and the reliability, validity and generalizability of the test items over time and across situations is enhanced (Breugh, 2009).

Like SJTs, the biodata methodology has a strong record in predicting performance. In an expansive meta-analytic review of the personnel selection literature, Schmidt and Hunter (1998) found a significant and positive direct relationship ( $r = 0.30$ ) between the biodata methodology and performance. Hunter and Hunter (1984) found that the use of a biodata methodology shared significant correlations with supervisor ratings ( $r = .37$ ), training success ( $r = .30$ ), tenure ( $r = .26$ ), and promotion ( $r = .26$ ). Brown (1981) supported that biodata also significantly predicted sales performance ratings ( $r = .26$ ) among life insurance salesmen. Meta-analytically, Bliesener

(1996) supported that biodata methodology was moderately correlated with objective performance ( $r = .53$ ), subjective performance ratings ( $r = .32$ ) and overall training success ( $r = .36$ ).

Biodata methodology has also been supported as having a strong record in predicting performance above and beyond more traditional personnel selection methodologies, such as personality- and cognitive-based measures. Mount, Witt, and Barrick (2000) concluded that when biodata items are used in combination with other established personnel selection methodologies, including general mental ability, personality, and incumbent experience, biodata accounted for up to 5% unique variance in the criterion. Schmidt and Hunter (1998) evaluated the incremental predictive power of biodata items over cognitive ability and found that biodata methodology accounted for a slight ( $\Delta R^2 = .01$ ), incremental increase in the prediction of performance. Dean, Russell, & Muchinsky (1999) suggested that along with cognitive ability and work simulations, biodata achieved the highest predictive power in the prediction of performance across situations.

Thus, similar to the SJT methodology, biodata ~~also~~ provides a number of important contributions to predicting performance beyond more traditional testing methodologies. As a result, biodata items will also be included on the EOPI measure as criteria variables. The extent to which the EOPI SJT items can show significant relationships with historical life history items that are clearly indicative of entrepreneurial behaviors will provide consistent support that the measure is measuring Entrepreneurship-related characteristics. Empirical and theoretical contributions from Kibas and K' Aol's (2004) study evaluating important characteristics and life history factors influencing entrepreneurship were used to develop biodata items. In addition, contributions from Athayde's (2009) work with students in England were also used to identify

potential biodata items. Based on this review, biodata items assessing: applying for a patent (or other legal entity), developing a mission statement for a business venture, developing a potential business name for a venture and having owned and/or operated a business were identified as critical entrepreneurial behaviors that are likely to be predicted by the EOPI measure (see Appendix D to review each of the EOPI biodata items).

The previous section provided literature on the use of biodata items to evaluate the criterion validity of the EOPI measure in relation to important Entrepreneurship-related behaviors. In the next section, a discussion of the processes used to develop a scoring key within a sample of 49 working adults will be reviewed and discussed.

## **Chapter 5 - Developing an SJT Scoring Key**

### **Study 1**

Unlike traditional cognitive and personality tests, SJTs are often designed so that there is no definitively “correct” answer (Bergman, Drasgow, Donovan, Henning, & Juraska, 2006; Whetzel & McDaniel, 2009). Rather, they are often constructed to have multiple plausible answers and the respondent is asked to select the options that represent the best and worst behavioral actions (Bergman et al., 2006; Motowidlo et al., 1990). As such, there is no single correct method to score SJT items.

Researchers have outlined a number of common methods for scoring SJTs, but the four that are most commonly cited are the following: empirical keying, theoretical keying, expert-based scoring, and a hybridized scoring methodology (Bergman et al., 2006; Findlay, 2007; Whetzel & McDaniel, 2009; Weekley & Ployhart, 2006). Empirical keying is a purely data-driven methodology in which each item response is correlated with the criterion of interest and



the items that share the greatest and least correlation with the criterion are assumed to reflect the best/worst, most effective/least effective response options. Within a specific organization that uses a consistent criterion measure; empirical keying has been shown to provide relatively stable validity coefficients across administrations. Yet, when the results are used across organizations or within different departments, the extent to which these findings are stable and generalize across organizations and settings is limited (Findlay, 2007; Mumford & Owens, 1982, 1987; Weekley & Ployhart, 2006; Whetzel & McDaniel, 2009).

Theoretical keying, or rational keying, uses theoretical arguments to support and identify the most appropriate and least appropriate response options. Rather than relying on an empirical analysis of the data to identify appropriate and inappropriate response options, theoretical arguments and findings in the literature provide the major vehicle through which the best and worst responses are identified. Options that are developed to contradict theory are scored as incorrect, whereas options that are irrelevant or unrelated to the theoretical evidence are scored zero (Whetzel & McDaniel, 2009). An advantage of the theoretical or rationale approach is that the results are more likely to generalize across settings. Primary disadvantages of the rational approach are that the “correct” or “best” response options become more transparent, and the validity coefficients for rationally-keyed responses tend to be smaller than the validity coefficients found using an empirical approach (Bergman et al., 2006; Whetzel & McDaniel, 2009).

An expert-based scoring approach relies on the judgment of knowledgeable subject matter experts to identify the most appropriate and least appropriate response options. Subject matter experts (SMEs) are presented with the scenarios and response options and asked to choose those that are most appropriate and least appropriate to the criterion of interest (Bergman et al.,

2006; Whetzel & McDaniel, 2009). Interrater reliability among the raters is then used to determine which responses are most and least appropriate to develop a scoring key. Scoring is based on the extent to which the test respondents' judgment of the best/worst, most/least effective behavioral response to the scenario is consistent with that selected by the body of experts.

More recently, researchers have turned to a hybridized approach to evaluating and scoring SJTs. Findlay (2007) cited the work of Bergmann et al. (2006) in developing a hybridized approach for evaluating training-based SJTs. Essentially, the methodology called for integrating both the use of empirical- and respondent-based ratings to determine the most and least effective response options to develop a scoring key. Although a multitude of research has been conducted on each methodology, collectively the body of research has not provided substantial evidence to fully support the use of one methodology over the other (Bergmann et al., 2006; Whetzel & McDaniel, 2009). Yet, Whetzel and McDaniel concluded that "the validity of an SJT depends in part on its scoring and that poor choices could lead to the conclusion that SJTs are not valid when it may only be that the scoring key is not valid" (p. 195). Similarly, Findlay (2007) argued that "considering the impact a chosen scoring protocol can have on test utility and validity, it is essential that researchers continue developing and investigating new and improved scoring keys for SJTs" (p. 9).

The current research will use an expert-based approach to score the current SJT items. Although an empirical approach is likely to result in greater validity coefficients, empirical approaches are more likely to capitalize on spurious and chance relationships and be less generalizable to alternative settings (Bergman et al., 2006). In addition, an empirical approach Although the response options were developed using a rational approach, the theoretical

development of the items also have not been fully supported, providing caution for utilizing a rational approach to evaluate the EOPI measure. In addition, Hough and Paullin (1994) also suggested that theoretical scoring may be more prone to faking due to transparency in response item development. Finally, as emphasized by both Bergman et al. (2006) and Findlay (2007), clarity and research on the steps and processes need to properly conduct hybridized evaluation of SJTs also needs further refinement, thus limiting the extent to which this scoring methodology would be useful for scoring the EOPI. In contrast, the Motowidlo et al., (1990) expert-based methodology for scoring SJTs has received strong support in the literature (Whetzel & McDaniel, 2009). As a result, an expert-based scoring methodology was used to score the EOPI items.

In Study 1, a sample of working adults will be considered to be “experts” and utilized to create a scoring key to identify the “correct” most and least effective response to each EOPI scenario. Precedence for using graduate-level students or working adults as experts has been supported by Bergman et al. (2006). Bergman et al. used a sample of 15 “SMEs” who were enrolled in a graduate-level Industrial/Organizational Psychology to assess Leadership Skill. Bergman et al. cited the students training in Leadership theories, as well as a focused Psychology curriculum as factors specifying the graduate students as experts. In the current study, a working adult sample was used to provide expert ratings on each of the EOPI scenarios. Although the extent to which a working adult sample is an effective proxy for “experts”, Legree, Psotka, Tremble, and Bourne (2005) evaluated the difference between “experts”, “journeymen” and “novices”. Journeymen were those that had some familiarity with the construct and a varying level of expertise, but did not have “well-developed, mature knowledge structures reflecting, broad, extensive sets of experience” (p. 17) to be considered experts. Yet, the sample did consist

of working adults whom all have at least a Bachelor's degree in their primary academic discipline (e.g., Engineering, Education, Business, Social and Natural Sciences) as well as a minor in Leadership Studies. Thus, it is reasonable to assume that individuals in this sample population are likely to have some familiarity with effective and ineffective business management processes and leadership strategies to be considered journeyman, especially in comparison to the average undergraduate student and/or the population in general. Legree et al., suggested that with a larger sample approaching 200, the "correct" response identified by those with some experience would correlate at .72 with the "correct" response identified by experts.

### ***Methods – Study 1***

#### ***Subjects***

Working with faculty members from the School of Leadership Studies (SLS) department at a mid-sized Midwestern university, a working sample of SLS alumni were identified and emailed information about the study, the purpose of the study, contact information and survey instructions. Alumni were offered the opportunity to complete the survey on a voluntary basis. Seventy-two individuals accessed the online survey and completed at least one item. A total of forty-nine respondents completed the entire survey. This resulted in a survey completion rate of approximately 68%.

### ***Materials- Study 1***

#### ***Informed Consent***

The informed consent provided information about the purpose of the study, the review process conducted by the Institutional Review Board (IRB), and contact information for both members of the review board and the primary researchers (See Appendix E).

### ***Demographics***

Demographic items included items related to the participants' age, gender, ethnicity, education level, job level, etc. See complete listing of demographic items in Appendix F.

Demographic items were optional to keep the survey completion time under requested 30-minute time limit.

### ***Entrepreneurial Orientation Profile Inventory***

Entrepreneurial Orientation was evaluated using the 12-item SJT-based Entrepreneurial Orientation measure developed specifically for the current research, and discussed previously. The measure used four items each to evaluate the Proactiveness, Innovativeness and Risk-Taking dimensions of Entrepreneurial Orientation. Response instructions requested that each respondent select both the "most effective" and "least effective" option of 4 potential response options. See Appendix B for a complete listing of the twelve scenarios that were used in the present study.

### ***Behavioral-Based Criterion Validity Variable***

Biodata items will be used as a behavioral based measure to evaluate the criterion validity of the EOPI. Items assessing patents/legal entity applied for to protect idea, development of a business mission statement, potential business venture name development, and personal business ownership/operation were used to evaluate the criterion validity of the EOPI. These items were self-developed. The biodata items were intended to aid in determining how items on the EOPI measure correlated with specific Entrepreneurship-related life history behaviors. Biodata items were rated dichotomously, where 1 = No and 2 = Yes. See Appendix D for a full listing of the items.

## *Analyses - Study 1*

### *Data Screening*

Prior to analyses, demographic items were evaluated for missing or improperly coded items. In addition, the skewness and kurtosis were evaluated to determine if the response patterns followed a normal distribution. A review of these descriptive statistics did not suggest any significant violations of the normality, linearity, independence and homogeneity of variance assumptions of the general linear model.

### *Demographics*

Consistent with the request of the organization providing assistance, an effort was made to keep the length of the survey less than 30 minutes. As such, the demographic portion of the survey was completely optional and therefore only completed by 28 of the 49 respondents. The demographic statistics presented next are based on the responses of those 28 participants. Of those completing the demographics 96.4% were Caucasian, 57.1% were female, 67.9% were managers at their jobs, the average age was 27.00 (SD = 4.94). Of those completing a college degree, 60.7% completed a Bachelors, 32.1% a Masters, and 7.2% either a doctorate or other professional degree. Approximately 16% of the respondents were working in Engineering, 12% in Health Care, 10% in Business occupations and 10% in Education. 8% were in Construction and 8% were in the Hotel & Restaurant Industry. Approximately 26% were employed in a variety of other occupations.

### *Behavioral-Based Criterion Validity Variable*

Within the expert sample, 29% (N =14) had taken at least one Entrepreneurship course. Of the 28 who provided responses to the biodata items, approximately 25% (N = 7) had formally

developed a mission statement for a business venture. Approximately 43% (N =12) had developed a business name for a potential venture and approximately 21% (N = 6) reported having owned or operated a business. These findings suggested limited evidence of Entrepreneurial Behavior.

### ***Scoring Procedures- Study 1***

According to Motowidlo et al. (1990), identifying the “correct” response for scoring an SJT instrument requires that interrater agreement among the respondents be evaluated. In the next section, the process used to evaluate the level of interrater agreement on the rank order of the item response options within the “most” and “least” effective conditions will be discussed.

### ***Evaluating Interrater Agreement for Response Options – Study 1***

Expert agreement of the “most” and “least” effective response option was conducted on each item. First, using the SPSS randomization function, the expert sample (N = 49) was randomly split into two approximately equal groups. Group 1 consisted of 26 respondents, and Group 2 consisted of 23 respondents. Next, a proportional endorsement rate (PER) was calculated for each response option (RO). PER was calculated by dividing the total number of experts selecting the item by the total number of experts providing judgments. For example, in the “most effective” condition, for Item P1, the total number of experts in Group 1 endorsing each response option was as follows: RO1: 12; RO2: 8; RO3: 1 and RO4: 5. To calculate PER values for each of the four response options, each value was then divided by the total number of experts providing judgments (N = 26). Thus, the PER value for each response option was calculated to be as follows: .44 for RO1, .30 for RO2, .04 for RO3 and .19 for RO4 (see Table 1). Next, each response option was ranked in ascending order according to its PER value, that is, the response option with the lowest PER was assigned a rank value of 1 and the response option

with the highest PER received a rank value of 4. Based on this step, the rank of the Item P1 response options was as follows: RO3 =1; RO4 = 2; RO2 = 3 and RO1= 4.

After identifying the PER rank order of the response options in Group 1, the same procedures were used to determine the PER rank order of the response options in Group 2 (N = 23). In Group 2, the total number of experts endorsing each Item P1 response option was as follows: RO1: 13; RO2: 2; RO3: 7 and RO4: 1. When each value was divided by the total number of experts providing ratings (N = 23), the PER for each response option was .54 for RO1, .08 for RO2, .29 for RO3 and .04 for RO4 (See Table 1). This resulted in an ascending rank order of the response options as follows: RO4 =1; RO2 = 2; RO3 = 3 and RO1 = 4.

To evaluate agreement among the experts, a rank difference score (RDS) was calculated by subtracting the PER rank order of each item's response option in Group 1 from its associated PER rank order in Group 2. To the extent that the rank order of the response options across Groups 1 and 2 were consistent, agreement among the experts on the "correct" response option could be determined. Returning to the P1 example, the PER rank order of RO1 in both Groups 1 and 2 was "4"; therefore the RDS is 4-4, or "0". For RO2, the PER rank order was "3" in Group 1 and "2" in Group 2; therefore the RDS is "1". For RO3, the rank order was "1" in Group 1 and "3" in Group 2; therefore the RDS is the absolute value of 1-3, or "2". Finally, for RO4, the rank order was "2" in Group 1 and "1" in Group 2, resulting in a RDS of "1". Next, the RDS values for each response option was summed to calculate an overall item RDS. Thus, in the current example, the overall item RDS was calculated to be 4 (i.e., 0 + 1 + 2 + 1) (see Table 1).

Prior to analyses, a cutoff for the overall item RDS was set a priori. Even under complete disagreement, the maximum value that the overall item RDS could achieve is 8. Therefore, a decision was made to set the overall item RDS at 3, which would suggest that the rank order of



the response options in Group 1 were relatively consistent with the rank order of the response options in Group 2. Items with overall item RDS less than 3 would be retained, whereas items with a value greater than 2 would be excluded from subsequent analysis across both the “most effective” and “least effective” conditions.

### ***Results from Study 1***

With an overall item RDS set at 3, within the “most effective” response condition, the experts agreed on rank order of the response options effectiveness for 7 of the 12 items (Items P2, P4, I2, I3, I4, R2 and R4). The experts failed to provide a consistent ranking of the effectiveness of the response options for 5 of the 12 items (Items P1, P3, I1, R1 and R3). As a result, these five items were determined to lack agreement and were removed from subsequent analyses. The complete data for the RDS analyses for the “most effective” response options and items can be reviewed in Table 1.

Within the “least effective” response condition, the experts agreed on the rank order of the response options’ ineffectiveness for 9 of the 12 items (Items P1, P2, P4, I2, I3, I4, R2, R3 and R4). However, for 3 of the 12 items (Items P3, I1 and R1), the experts failed to provide a consistent ranking of the least effective response options. As a result, these three items were determined to lack agreement and were removed from subsequent analyses. The complete data for the RDS analyses for the “least effective” response options and items can be reviewed in Table 2.

### ***Discussion of Study 1***

Study 1 was conducted to determine the level of agreement among the “expert” population of a consistent rank order of the item response options on the EOPI measure. In the “most effective” condition, experts showed consistency on the rank order of 7 of the 12 items. In

the “least effective” condition, experts reached showed consistency on the rank order of 9 of the 12 items. These findings suggest that, in general, experts show greater consistency in identifying *ineffective* behavioral responses than in identifying *effective* behavioral responses to resolve a variety of judgment-based scenarios framed within an Entrepreneurship setting.

Baumeister, Bratslavsky, Finkenauer, and Vohs (2001) concluded that bad experiences “have more impact than good ones, and bad information is processed more thoroughly than good (p. 323). As a result, the finding that working adults would be better at identifying “least effective” solutions over “more effective” solutions is not surprising. Most people are familiar with how ineffective planning, strategy implementation and allocation of resources can contribute to organizational inertia and stagnation. People take note, especially, when unethical, ineffective or questionable managerial practices results in the loss of significant financial capital, jobs and/or in some other way alters brings into question the importance of leadership and ethics within the corporation. Ghoshal (2005) discussed how scandals associated with Enron and Worldcom influenced the re-evaluation of business courses to focus on how to prevent similar scandals from happening in the future. This is often at the expense of focusing on organizations that are being effectively managed.

Because the severity, consequences and impact of ineffective managerial behavior is are so profound, employees are told these stories of failure as cautionary tales and taught “what not to do”. Alternatively, success is expected and when things are going well, people are less likely to focus on the specific processes leading to success. Over time, awareness of ineffective business management practices are is emphasized and ingrained within workers through both their academic and industry-related experiences. As a result, employees are conditioned to notice ineffective management behaviors and these behaviors become more salient than effective

management behaviors. As a result, identifying ineffective practices across situations is more accessible to the respondents. The findings in Study 1 seemingly to support the idea of a greater emphasis on, and saliency of, bad situations condition respondents to recognize a consistent pathway to Entrepreneurship failure, but multiple pathways to Entrepreneurship success.

### *Limitations – Study 1*

One primary limitation of Study 1 may be related to the use of working adults as experts for scoring the Entrepreneurial Orientation SJT items. Yet, the sample did consist of working adults who all have at least a Bachelor's degree in their primary academic discipline (e.g., Engineering, Education, Business, Social and Natural Sciences) as well as a minor in Leadership Studies. In addition, within the expert sample, overall 29% had taken at least one Entrepreneurship course. Of the 28 who provided responses to the biodata items, approximately 25% had formally developed a mission statement for a business venture. Approximately 43% had developed a business name for a potential venture and approximately 21% reported having owned or operated a business. Thus, it is reasonable to assume that individuals in this sample population are likely to have some familiarity with effective and ineffective business management processes and leadership strategies, especially in comparison to the average undergraduate student and/or the population in general. Nevertheless, the extent to which all of those within the sample could be considered “experts” in the field of Entrepreneurship may be questioned. In the future, validating the identification of the “most effective” and “least effective” response option for each item using upper-level graduate students in more Business- and Entrepreneurship-centered disciplines, or with a sample of Entrepreneurs, would represent a useful research effort.

A second limitation is the relatively limited sample size of the expert population used to develop the scoring key. In their discussion of a consensus based scoring technique, Legree, Psofka, Tremble, and Bourne (2005) discussed the importance of using a relatively large sample size to identify the correct answer to an SJT measure, specifically when there is a concern that the sample expert population may not fully represent experts in the field of inquiry. Specifically, the authors found that when the respondent sample was sufficiently large, the correlation between the “correct” score provided by a sample of respondents and the “correct” score provided by a sample of experts exceeded .70. This finding would suggest that using a larger sample of adult workers to identify the “correct answer” could potentially be fairly consistent with that provided by experts, assuming that the sample size is sufficiently large (e.g., approximately 200).

### ***Conclusion – Study 1***

In Study 1, a working adult sample reached agreement on the rank order of the “least effective” response options for 9 of the 12 items. Even between the items on which they did not reach agreement, the PER value never exceeded 4 (with a low of 0 and a high of 8). This suggests the potential presence of some underlying construct that the respondents are using as a framework to determine the “least effective” response option. Consensus in the “most effective” solution condition was not as consistent, only reaching agreement on 7 of the 12 items. ~~Thus,~~ this finding suggests that adult workers can generally reach consensus on ineffective solutions to resolve each of the scenarios, but ~~were~~ are not as consistent in identifying the most effective solution to resolve these situations.

The identification of a consistent rank order among the response options within the “least effective” response condition, potentially suggests that adult workers are generally better able to

identifying a single most *ineffective* solution to a business-related problem, but less effective at identifying a single best *effective* solution to a business-related problem. This may be due to the saliency of bad events in the human psyche (Baumeister et al., 2001), as well as the focus on highly publicized scandals that generates training and educational courses on “what we do not do”, at the expense of time and effort spent on effective business practices (Ghoshal, 2005). Thus, when using an SJT format to evaluate business-related problems, asking respondents to identify the least effective responses is likely to provide more reliable and consistent identification of a “correct” response.

Taking into account the saliency and emphasis academic institutions and organizations focus on reducing ineffective management practices (Ghoshal, 2005), adult workers seem to have a consistent understanding of how ineffective strategy implementation can contribute to organizational inertia and stagnation.—They also seem to recognize that the pathway to organizational success may require flexibility and adaptability. Thus, when the items are scored and evaluated on an undergraduate population in the next section, it is expected that the students will show some consistency in identifying the correct response in the “most effective” condition, but will yield a greater level of consistency in identifying “least effective” responses. In turn, this greater level of consistency in the “least effective” condition will yield significant relationships with alternative measures of psychological constructs that will be used to evaluate the convergent and predictive validity of the EOPI measure. In the next section, the psychometric properties of the expert-based scoring key will be evaluated on a sample of undergraduate students. In particular, analyses will be conducted to determine if selecting the “correct” response on the EOPI measure is predictive of alternative attitude- and experiential-based outcomes of Entrepreneurship.

## **Chapter 6 - Evaluating the Construct and Criterion Validity of the EOPI EO on a Student Sample**

As discussed previously, Study 1 was conducted to identify the “correct” response option to the SJT-based items on the EOPI EO measure. Using a working adult sample consisting of 49 individuals, split into two groups, the most and least effective response options for each item was identified. In the “most effective” response option condition, experts agreed on the “most effective” response option solution for 7 of the 12 items. In the “least effective” response option condition, experts agreed on the least effective response option solution for 9 of the 12 items. In the following, an evaluation of the effectiveness of three response option instruction methods to score SJTs will be evaluated. In particular, an evaluation of how scoring the EOPI EO measure using either a “most effective”, “least effective”, or a “combined effectiveness” response instruction contributes to the reliability and validity of the EOPI EO measure will be reviewed.

### ***Method - Study 2***

#### ***Subjects***

The sample for the current study consisted of 188 undergraduate students enrolled in an Introductory Psychology course at a mid-sized Midwestern university. As part of the course requirements, students were provided the opportunity to either participate in a psychological experiment or complete a writing assignment for credit. The informed consent provided the students the purpose of the research, contact information and the format of the study. In addition, students were given the opportunity to voluntarily suspend participation in the research at any time without penalty. 191 individuals accessed the survey and completed at least one

item, and 188 completed the entire survey for a survey completion impact rate of approximately 98%.

According to Hytti and O’Gorman (2004), young people (i.e., those under the age of 25) represent an important underrepresented market in the field of entrepreneurship. With many young people searching for the increased autonomy, satisfaction, personal control, and freedom found in the independent work environment (Athayde, 2009; Schjoedt, 2009), it is important that the skills, knowledge, and experiences young people receive equip them with the necessary competencies vital for new venture success (Izquierdo & Deschoolmeester, 2008).

Even within the traditional, established corporate organization there is a renewed interest in understanding how on innovative and entrepreneurial behaviors can lead to greater competitive advantage. The dynamic global environment makes it vital that the traditional business models adapt to circumvent political, global, economic, and technological threats and weaknesses. Specifically, the increase in the number and sophistication of new international competitors, distrust in traditional corporate management methods, increases in the exodus of top organizational talent from the organization and towards independent (and competitive) start-ups, and the shortened the life cycle for products and technologies have made it necessary for organizations to implement strategies to exploit environmental opportunities aimed to sustain prolonged growth and long-term competitive advantage (Kuratko & Hornsby, 1999; Schindehutte, Morris, & Kocak, 2008; Veciana, 2007). This requires individuals who have the ability to adapt, be innovative, opportunity-seeking, aggressive in competition, and risk-taking.

## ***Materials- Study 2***

### ***Informed Consent***

The informed consent provided information about the purpose of the study, the review process conducted by the Institutional Review Board (IRB), and contact information for both members of the review board and the primary researchers (See Appendix E).

### ***Demographics***

Demographic items included items related to the participants' age, gender, ethnicity, major, job tenure, etc. See complete listing of demographic and biodata items in Appendix F. Demographic items were optional to keep the survey under the specified 30-minute time limit.

### ***Entrepreneurial Orientation Profile Inventory (EOPI)***

Entrepreneurial Orientation was evaluated using the 12-item Entrepreneurial Orientation Profile Inventory (EOPI) measure developed specifically for the current research. The development of the SJT items and their associated response options was discussed previously in Study 1 (see Appendix B).

### ***Construct Validity Variables***

An alternative measure of Entrepreneurial Orientation by Stewart (2009) and a measure of Entrepreneurial Self-Efficacy were used to evaluate the convergent construct validity of the EOPI measure. Entrepreneurial Orientation represents an attitude-based approach to evaluating Entrepreneurial Orientation, and as a result, should yield a high correlation with the EOPI. Research evaluating Entrepreneurial Self-Efficacy as a distinguishing characteristic of entrepreneurs (Chen, Greene, & Crick, 1998) and as a mediator of entrepreneurial intentions (Zhao, Siebert, & Hills, 2005) suggests that Entrepreneurial Self-Efficacy is a critical Entrepreneurship variable.



### ***Entrepreneurial Orientation***

An alternative attitude-based measure of Entrepreneurial Orientation developed by Stewart (2009) was used to evaluate the convergent construct validity of the EOPI measure. Stewart's measure of Entrepreneurial Orientation included 15 items designed to measure the Proactiveness, Innovativeness and Risk-Taking dimensions of Entrepreneurial Orientation. A sample Proactiveness item is "If I see something I don't like, I fix it." A sample Innovativeness item is "I search out new technologies, processes, techniques, and/or product ideas". A sample Risk-Taking item is "I prefer a low risk/high security job with a steady salary over a job that offers high risks and high rewards." In the current research, only 5 items from each of the three dimensions was included. The three items that were not selected were deemed to be too easily influenced by social desirability. These items were "I love being a champion for my ideas, even against others' opposition.", "I am innovative." and "I am not willing to take risks when choosing a job or a company to work for.", from the Proactiveness, Innovativeness and Risk-Taking dimensions, respectively. Stewart (2009) reported coefficient alpha reliabilities for the dimensions ranging between .73 and .81. In the current study, the items were summed to create a composite measure of Entrepreneurial Self-Efficacy. Respondents selected their level of agreement with the statement using a 7-point Likert scale (1= Strongly Disagree to 7 = Strongly Agree). See Appendix G for a full listing of the items.

### ***Entrepreneurial Self-Efficacy***

Entrepreneurial Self-Efficacy was also used to evaluate the convergent construct validity of the EOPI measure. Entrepreneurial Self-Efficacy was measured using 10-items from the revised Entrepreneurial Self-Efficacy measure (McGee et al., 2009). The original measure evaluates 6 dimensions of Entrepreneurial Self-Efficacy, which are labeled: Searching, Planning, Marshalling, Implementing-People, Implementing-Financial, and Attitude toward venturing.

Only the Searching, Planning and Marshalling dimensions of the measure were used in the current research. These dimensions were chosen because they focus primarily on the action-oriented behaviors that are facilitative of Entrepreneurship. A sample Searching item is “How much confidence do you have in your ability to identify the need for a new product or service?” A sample Planning item is “How much confidence do you have in your ability to determine a competitive price for a new product or service?” A sample Marshalling item is “How much confidence do you have in your ability to get others to identify with and believe in your vision and plans for a new business?” McGee and colleagues (2009) reported alpha levels ranging between .80 and .84 for the three dimensions, respectively. In the current study, the items were summed to create a composite measure of Entrepreneurial Self-Efficacy. Respondents selected their level of confidence in their skill level described by the statement using a 7-point Likert scale (1= Extremely Unconfident to 5 = Extremely Confident). See Appendix H for a complete listing of items.

### ***Criterion Validity Variables***

Teamwork and Engagement were considered to be more distal attitudinal variables that should share an association with the EOPI. Theoretical links for exploring Teamwork can be found by exploring metacognitive and cognitive adaptive theories. Both Haynie and Shepherd (2005) and Schraw and Moshman (1995) discuss the importance of shared knowledge, interactions with others, and cognitive adaptation and reasoning as primary factors related to the development of higher level judgment and reasoning. More specifically, within the organizational setting, Monsen (2005) found that Teamwork was a critical intermediate factor facilitating the relationship between Entrepreneurial Orientation and Job Performance. Stewart (2009) found that Teamwork shared a small, yet significant relationship with Entrepreneurial

Orientation. Jelenik and Litterer (1995) suggested that Engagement promotes Entrepreneurship by reducing ambiguity and initiating action. Bhola, Verheul, Thurik, and Grilo (2006) found that Engagement among workers is also related to the pursuit of Entrepreneurship and Innovation. As result, evaluating the relationship of both Teamwork and Engagement to the EOPI may be useful to support that the measure is predictive of important attitudinal and affective constructs that have been supported as positively associated with Entrepreneurship.

### ***Teamwork***

Teamwork will be used as an attitude-based measure to evaluate the criterion validity of the EOPI measure. Teamwork was evaluated using the 9-item Teamwork measure provided by Goldberg, Johnson, Eber, Hogan, Ashton, Cloninger, and Gough (2006). The Teamwork measure was obtained from the archives of the International Personality Item Pool, which is a scientific collaboration of a variety of international psychological scales designed to evaluate a number of alternative personality and individual differences (see <http://ipip.ori.org>; Goldberg et al., 2006). The measure assesses a single dimension of Teamwork. Sample items are “I don’t miss group meetings or team practices” or “I don’t think it’s important to socialize with others”. Respondents selected their level of agreement with the statement using a 5-point Likert scale (1= Strongly Disagree to 5 = Strongly Agree). The authors did not report an alpha reliability for the Teamwork measure. See Appendix I for a full listing of the items.

### ***Engagement***

Engagement will provide an additional attitude-based measure to support the criterion validity of the EOPI measure. Engagement was evaluated using the 12-item Utrecht Work Engagement Scale (UWES) measure provided by Schaufeli, Bakker and Salanova (2006). The UWES measure assesses the Absorption, Dedication and Vigor dimensions of Engagement, but

can also be evaluated as a unidimensional construct (Schaufeli et al., 2006). A sample Absorption item is “Time flies when I am working”. A sample Dedication item is “I am proud of the work that I do”. A sample Vigor items is “At my work/school, I feel bursting with energy”. In the current study, engagement will be evaluated at the unidimensional level. Respondents selected their level of agreement with the statement using a 5-point Likert scale (1= Strongly Disagree to 5 = Strongly Agree). Reported alpha for the measure is between .77 and .92 (Schaufeli et al., 2006). See Appendix J for a full listing of the items.

### ***Behavioral-Based Criterion Validity Variable***

Biodata items will be used as a behavioral based measure to evaluate the criterion validity of the EOPI. Items assessing patents/legal entity applied for to protect idea, development of a business mission statement, potential business venture name development, and personal business ownership/operation were used to evaluate the criterion validity of the EOPI. These items were self-developed. The biodata items were intended to aid in determining how items on the EOPI measure correlated with specific Entrepreneurship-related life history behaviors. Biodata items were rated dichotomously, where 1 = No and 2 = Yes. See Appendix D for a full listing of the items.

## ***Analyses - Study 2***

### ***Data Screening***

Prior to analyses, demographic items were evaluated for missing or improperly coded items. In addition, the skewness and kurtosis of the study variables were evaluated to determine if the response patterns followed a normal distribution. A review of these descriptive statistics did not suggest any significant violations of the normality, linearity, independence and homogeneity of variance assumptions of the general linear model.

### ***Demographics***

As with the population in Study 1, an effort was made to keep the length of the survey less than 30 minutes. As such, the demographic portion of the survey was completely optional. However, 188 of the 191 students who accessed the survey provided demographic data. As a result, the demographic statistics presented below are based on an N = 188. Of those completing the demographics, 83.3% were Caucasian, 1.6% African-American, 2.2% Hispanic, 5.9% Asian and 7.0% Other. Females made up 62.2% of the sample, whereas 37.8% were male. Freshmen accounted for 64.5% of the sample, 19.4% were sophomores, 11.8% were juniors and 4.3% were seniors or beyond. The average age was 19.55 (SD = 2.51). 83.2% worked part-time, 4.2% worked full-time and 12.6% did not report whether they worked full- or part-time. In addition, 93.5% reported being non-managers and 6.3% reported working in a managerial position. 2.6% did not provide data on managerial position. Approximately 17% of the respondents were in majors related to Medicine, 15% were majoring in Agriculture, 14% were majoring in Business, 9% were majoring in Natural Sciences, 9% were Arts/Humanities majors, 8% were Engineering majors, 5% were Social Science majors, 4% were Human Ecology majors, and 19% were majoring in Open-Option or Other.

Following the evaluation of the demographic statistics, the data was analyzed to determine the psychometric effects of scoring the EOPI composite using each of three differential scoring techniques: “most effective”, “least effective” and a combined “most and least” effective method. First, a general look at the procedures used to score each item across the three response instruction conditions.

### ***Behavioral-Based Criterion Validity Variable***

Within the student sample, approximately 6% (N = 11) had applied for a patent or copyright; 15% (N = 27) had formally developed a mission statement for a business venture.

Approximately 22% (N =41) had developed a business name for a potential venture and approximately 13% (N = 23) reported having owned or operated a business. These findings suggested limited evidence of Entrepreneurial Behavior.

### ***Procedures for Scoring Items on the EOPI Composite***

Using the results from Study 1, the PER ratings provided by the expert sample (N = 49) were evaluated to identify a “correct” answer for the items that were retained for scoring in both the “most effective” and least effective” conditions. For each item, the response option achieving the highest PER was identified as the “correct” response and used to score the response provided by the undergraduate sample for Study 2. Scoring of the items followed the procedures proposed by Motowidlo et al. (1990). The Motowidlo et al. procedure suggested a scoring scheme in which testing respondents that selected the “correct” response option (i.e., the response option with the highest PER endorsement by the expert sample) received a score of +1 on the item. Respondents who disagreed with the experts (i.e., selected the “correct” response option as the least effective action) received a score of -1. Finally, respondents that failed to identify the “correct” response option as the “most effective” or “least effective” received a score of 0. Therefore, for each item, a respondent would receive a score ranging from -1 to +1. This scoring procedure was utilized to identify and score the “correct” response option for both the “most effective” and “least effective” response instruction format conditions.

## ***Results - Study 2***

### ***The “Most Effective” Response Solution – Study 2***

Using the results from Study 1, the PER ratings for each item were used to identify a “correct” answer for the 7 items that were retained for scoring and analyses in the “least effective” condition (see Tables 1 and 3). These items were Items P1, P2, P4, I2, I3, I4, R2, R3

and R4. For each item, the response option achieving the highest PER was identified as the “correct” response and used to score the response provided by the undergraduate sample for the current study. Scoring procedures provided by Motowidlo et al. (1990) and discussed previously were used to score each item. For each item, a respondent could receive a score ranging from -1, 0 or +1, based on their level of agreement with the experts. Thus, summing the scores across each of the seven items to create an EOPI composite score would result in a total score ranging from -7 to +7. Next, the biodata items were reviewed to determine whether an overall composite of the 4 items would provide a reliable measure of a unidimensional composite labeled Entrepreneurial Behavior.

### ***Reliability of a Unidimensional Biodata Composite of Entrepreneurial Behavior – Study 2***

Biodata items relative to patents/copyrights/licenses, business mission statement development, business venture name development, and personal business operation were created to aid in the evaluation of the criterion validity of the EOPI measure. The means, standard deviations and intercorrelations of the biodata items were calculated to determine whether the items individually had sufficient variance to find significant relationships if they existed. A review of the means revealed an average value very close to 1 for each of the four biodata items. Interpretation of this finding would suggest that few of the participants had engaged in behaviors such as applying for patents, developing a mission statement, developing a business venture name, or personally operating a business. Therefore, the variance for any specific biodata item was likely to underestimate a significant relationship between the EOPI measure and the biodata items, if they indeed existed. A review of the intercorrelations between each of the four biodata items revealed that, in general, the items shared a modest significant, positive relationship ( $r_s$  ranging between .19 and .45). This finding suggested that creating a reliable unidimensional

construct was feasible. As a result, all four of the biodata items were aggregated to create a unidimensional Entrepreneurial Behavior composite. The reliability of the Entrepreneurial Behavior construct was .68.

### ***Intercorrelations among the Criteria Variables – Study 2***

Intercorrelations among the criteria variables were examined to determine to what extent the variables shared common variance. As shown in Table 3, Entrepreneurial Orientation was significantly and positively related to Entrepreneurial Self-Efficacy ( $r(188) = .44, p < .01$ ), Teamwork ( $r(188) = .30, p < .01$ ), Engagement ( $r(188) = .28, p < .01$ ) and Entrepreneurial Behavior ( $r(188) = .27, p < .01$ ). Entrepreneurial Self-Efficacy was positively related to Teamwork ( $r(188) = .30, p < .01$ ) and Engagement ( $r(188) = .33, p < .01$ ), but not with Entrepreneurial Behavior ( $r(188) = .06, p = n.s.$ ). Teamwork also yielded a significant relationship with Engagement ( $r(188) = .23, p < .01$ ), but not with Entrepreneurial Behavior ( $r(188) = .11, p = n.s.$ ). Engagement and Entrepreneurial Behavior did not share a significant relationship ( $r(188) = .05, p = n.s.$ ). The modest degree of interrelationship among the criterion variables suggests some overlap in the construct of entrepreneurial attitudes and behaviors.

Mono-method bias among the criterion variables was evaluated using the process described by Podsakoff, MacKenzie, Lee, and Podsakoff (2003). An exploratory factor analysis using principal axis factoring and a promax rotation was conducted and the factor loading of each criterion variable was evaluated to determine if they would load on multiple factors or a single factor. The initial exploratory factor analyses suggested the presence of 2 factors. Factor 1 consisted of Stewart's EO measure, Entrepreneurial Self-Efficacy, Teamwork and Engagement. Factor 2 consisted of the EOPI composite and the Entrepreneurial Behavior composite. These results suggested that the Stewart's Entrepreneurial Orientation,



Entrepreneurial Self-Efficacy, Teamwork and Engagement scales all loaded on a single factor. This finding would support that both the Likert-type scoring response option format and the cross-sectional administration of the survey are likely being influenced by mono-method bias.

Next, the psychometric properties of the EOPI composite were evaluated. The results are structured to first evaluate the reliability of the composite, followed by a review of the findings supporting the construct validity of the composite. Then, a review of the empirical results related to the criterion validity of the EOPI composite will be reviewed. In all situations, the initial evaluation of these relationships at the composite level is followed by a similar review at the item level.

#### ***Reliability of the EOPI Composite in the “Most Effective” Condition – Study 2***

Following the assignment of scores, descriptive statistics, including mean, standard deviation and intercorrelations were calculated for every item (See Table 3). Intercorrelations among the items were evaluated to determine their level of shared common variance. To the extent that items within a specific dimension shared common variance with other items within designed to assess that same dimension, summing the EOPI items to create distinct Proactiveness, Innovativeness and Risk-Taking sub-dimensions could be empirically supported. Alternatively, if the intercorrelations among the items varied across the three dimensions, adding all of the items together to create a unidimensional construct would not be empirically supported.

As shown in Table 3, across 21 intercorrelations, 5 correlations were significant. Item P4 shared a significant, positive relationship with Items I4 ( $r(188) = .15, p < .05$ ), R2 ( $r(188) = .15, p < .05$ ) and R4 ( $r(188) = .17, p < .05$ ). In addition, Item R2 was found to be significantly and positively correlated with Item I3 ( $r(188) = .16, p < .05$ ) and Item I4 ( $r(188) = .16, p < .05$ ). Although there were only 5 significant correlations, this finding is greater than the number of

significant correlations that would be expected purely by chance alone. This review of the correlation matrix suggests that when the items were correlated, the significant correlations most often occurred across the Innovative and Risk-Taking items within the scale; although these relationships were generally small. Therefore, rather than exploring a multi-dimensional factor of the EOPI, a unidimensional factor of the measure was explored.

To further validate the representativeness of a unidimensional construct in the “most effective” condition, an exploratory factor analyses was conducted to determine the dimensionality of the EOPI measure. A varimax orthogonal rotation of the factor components was used. A varimax rotation assumes that the items within a scale are uncorrelated and seeks to maximize the factor loading of each item on a specific dimension and is especially useful in dimension interpretation (Fabrigar, Wegener, MacCallum, & Strahan, 1999; Hayton, Allen, & Scarpello, 2004). Factor loadings of .40 or less account for 16% or less of the variance in the overall latent construct and as a result, a factor loading cutoff of .40 was implemented.

Kaiser (1960, 1970) suggested that a more beneficial way to determine (or verify) the number of factors within a solution may be to evaluate the scree plot. The scree plot presents a graphical representation of the factors within a dataset based on their eigenvalues and percentage of variance for which each variable is accountable. Typically, eigenvalues exceeding 1.00 or scree plot factors above the elbow of the inverted-J curve (i.e., where the curve begins to flatten out) are interpreted. Kaiser (1970) suggested that when the eigenvalue of a factor is greater than 1, the reliability of the component must always be non-negative.

The scree plot, factor loadings and percentage of variance accounted for by each factor was evaluated to determine the number of factors to retain. A review of the eigenvalues greater than 1 suggested the presence of three factors. However, further examination of the scree plot

suggested that the items were better represented by a single factor accounting for a relative modest 20.89% of the variance (see Appendix K). This finding supplemented the findings from the correlation analyses that the EOPI measure was best evaluated as a unidimensional construct. To create a unidimensional EOPI composite, the 7-items on the EOPI in the “most effective” condition were summed. As a result, each respondent could receive a total score on the EOPI measure ranging from -7 to +7. When the internal consistency of this unidimensional EOPI composite was evaluated, the alpha coefficient was .32. Item statistics did not suggest that the removal of any of the items from the composite would improve the overall reliability of the construct.

#### ***Construct Validity of the EOPI Composite in the “Most Effective” Condition – Study 2***

An attitude-based measure of Entrepreneurial Orientation provided by Stewart (2009) and an attitude-based measure of Entrepreneurial Self-Efficacy from McGee et al. (2009) were used to evaluate the convergent validity of the EOPI. Alpha for Stewart’s Entrepreneurial Orientation was .70 and alpha for Entrepreneurial Self-Efficacy was .85. As reported in Table 3, correlational analyses revealed non-significant relationships between the EOPI measure for both Stewart’s Entrepreneurial Orientation ( $r(188) = .03, p = \text{n.s.}$ ) and Entrepreneurial Self-Efficacy ( $r(188) = -.05, p = \text{n.s.}$ ).

#### ***Construct Validity of the EOPI Items in the “Most Effective” Condition – Study 2***

Next, each of the EOPI items was individually correlated with Stewart’s Entrepreneurial Orientation measure and the Entrepreneurial Self-Efficacy measure to determine whether individual items showed significant relationships with the two measures. Forward step-wise regression analyses were conducted to determine the extent to which each of the EOPI items were predictive of Entrepreneurial Orientation and Entrepreneurial Self-Efficacy outcomes in the

“most effective” condition. For both Entrepreneurial Orientation and Entrepreneurial Self-Efficacy, no items were significantly predictive of the outcomes.

### ***Criterion Validity of the EOPI Composite in the “Most Effective” Condition – Study 2***

Criterion validity of the EOPI measure was conducted to determine the extent to which the measure was predictive of Teamwork and Engagement. Alpha for Teamwork was .81 and alpha for Engagement was .88. Correlational analyses were conducted and the analyses revealed non-significant relationships between the EOPI measure for both Teamwork ( $r(188) = -.01, p = \text{n.s.}$ ) and Engagement ( $r(188) = -.03, p = \text{n.s.}$ ). Next, the relationship of the EOPI measure to the biodata-based measure of Entrepreneurial Behavior was evaluated. Correlational analyses failed to support the EOPI measure as significantly related to the Entrepreneurial Behavior construct ( $r(188) = -.02, p = \text{n.s.}$ ). Next, the criterion validity of the EOPI was evaluated on the individual items of the EOPI.

### ***Criterion Validity of the EOPI Items in the “Most Effective” Condition – Study 2***

Next, each of the EOPI items was individually correlated with the criteria variables to determine if individual items within the measure were predicting the criteria outcomes. Correlational analyses at the item level yielded no significant relationships. Following the analyses of the most effective response option, similar analytical procedures were conducted to evaluate the reliability, construct and criterion validity for the “least effective” response solution.

### ***The “Least Effective” Response Solution – Study 2***

Using the results from Study 1, the PER ratings for the response options were used to identify a “correct” answer for the 9 items that were retained for scoring and analyses in the “least effective” condition (see Tables 2 and 4). These items were Items P1, P2, P4, I2, I3, I4,

R2, R3 and R4. For each item, the response option achieving the highest PER was identified as the “correct” response and used to score the response provided by the undergraduate sample for the current study. Scoring procedures provided by Motowidlo et al. (1990) and discussed previously were used to score each item. For each item, a respondent could receive a score ranging from -1, 0 or +1, based on their level of agreement with the experts. Thus, summing the scores across each of the nine items to create an EOPI composite score would result in a total score ranging from -9 to +9.

Next, the psychometric properties of the EOPI composite are evaluated. The results are structured to first evaluate the reliability of the composite, followed by a review of the findings supporting the construct validity of the composite. Then, a review of the empirical results related to the criterion validity of the EOPI composite will be reviewed. In all situations, the initial evaluation of these relationships at the composite level is followed by a similar review at the item level.

### ***Reliability of the EOPI Composite in the “Least Effective” Condition – Study 2***

Following the assignment of scores, descriptive statistics, including mean, standard deviation and intercorrelations were calculated for each item (See Table 4). Intercorrelations among the items were evaluated to determine their level of shared common variance. As shown in Table 4, across 36 intercorrelations, 12 correlations were significant. Item P2 had 6 of the 12 significant relationships, sharing a significant relationship with Items P1 ( $r(188) = .20, p < .01$ ), P4 ( $r(188) = .19, p < .01$ ), I2 ( $r(188) = .19, p < .05$ ), I4 ( $r(188) = .16, p < .05$ ), R2 ( $r(188) = .17, p < .05$ ) and R4 ( $r(188) = .25, p < .01$ ). In addition, Item I2 also shared a significant relationship with Items P1 ( $r(188) = .20, p < .01$ ) and P4 ( $r(188) = .19, p < .05$ ). Item P4 also yielded a significant relationships with Items I3 ( $r(188) = .19, p < .01$ ) and I4 ( $r(188) = .17, p < .05$ ).

Finally, Item R3 shared significant relationships with Items I3 ( $r(188) = .17, p < .05$ ) and I4 ( $r(188) = .23, p < .01$ ). This review of the correlation matrix suggests that when the items were correlated, the significant correlations did not occur in a consistent pattern within the a priori specified dimensions, but rather occurred across all of the items, regardless of dimensions. To further validate the representativeness of a unidimensional construct in the “least effective” condition, an exploratory factor analyses was conducted. The scree plot, factor loadings and percentage of variance accounted for by each factor was evaluated to determine the number of factors to retain. A review of the eigenvalues greater than 1 suggested the presence of four factors. However, further examination of the scree plot suggested that the items were better represented by a single factor accounting for a relative modest 19.97% of the variance (see Appendix K). This finding supplemented the findings from the correlation analyses that the EOPI measure was best evaluated as a unidimensional construct. To create a unidimensional EOPI composite, the 9-items on the EOPI in the “least effective” condition were summed. As a result, each respondent could receive a total score on the EOPI measure ranging from -9 to +9. When the internal consistency of this unidimensional EOPI composite was evaluated, the alpha coefficient was .45. Items\ statistics did not suggest that the removal of any of the items from the composite would improve the overall reliability of the construct.

#### ***Construct Validity of the EOPI Composite in the “Least Effective” Condition – Study 2***

The construct validity of the EOPI measure was evaluated using Stewart’s Entrepreneurial Orientation measure and the measure of Entrepreneurial Self-Efficacy. Correlational analyses revealed non-significant relationships between the EOPI measure and both Stewart’s Entrepreneurial Orientation ( $r(188) = .11, p = \text{n.s.}$ ) and Entrepreneurial Self-Efficacy ( $r(188) = .09, p = \text{n.s.}$ ).

#### ***Construct Validity of the EOPI Items in the “Least Effective” Condition – Study 2***

Next, each of the EOPI items was individually correlated with Stewart's Entrepreneurial Orientation measure and the Entrepreneurial Self-Efficacy measure to determine whether individual items showed significant relationships with the two measures. Forward step-wise regression analyses were conducted to determine the extent to which each of the EOPI items were predictive of Entrepreneurial Orientation and Entrepreneurial Self-Efficacy outcomes in the "most effective" condition. For both Entrepreneurial Orientation and Entrepreneurial Self-Efficacy, no items were significantly predictive of the outcomes.

#### ***Criterion Validity of the EOPI Composite in the "Least Effective" Condition – Study 2***

Attitude-based measures of Teamwork and Engagement were used to evaluate the criterion validity of the EOPI measure. Correlational analyses revealed a significant, positive relationship between the EOPI measure and Teamwork ( $r(188) = .16, p < .05$ ), but yielded a non-significant relationship with Engagement ( $r(188) = .11, p = \text{n.s.}$ ). As discussed previously in the "most effective" solution, the four biodata items were summed to create a unidimensional Entrepreneurial Behavior construct. Next, the relationship of the EOPI measure to the biodata-based measure of Entrepreneurial Behavior was evaluated. Correlational analyses failed to support the EOPI measure as significantly related to the Entrepreneurial Behavior construct ( $r(188) = .11, p = \text{n.s.}$ ). Next, the criterion validity of the EOPI was evaluated on the individual items of the EOPI.

#### ***Criterion Validity of the EOPI Items in the "Least Effective" Condition – Study 2***

Next, each of the EOPI items was individually correlated with the criteria variables to determine if individual items within the measure were predicting the criteria outcomes. Forward step-wise regression analyses were conducted to determine the extent to which each of the EOPI items were predictive of the Teamwork, Engagement and Entrepreneurial Behavior outcomes. For Teamwork, Item P2 was the only significant item ( $\beta (188) = .15, t = 2.04, p < .05$ ). For

Engagement, Item P2 was the only significant item ( $\beta (188) = .20, t = 2.71, p < .01$ ). For Entrepreneurial Behavior, Item P4 was the only significant item ( $\beta (188) = .17, t = 2.34, p < .05$ ). Following the analyses of the “least effective” response option, similar analytical procedures were conducted to evaluate the reliability, construct and criterion validity for the “combined effectiveness” response solution.

### ***The “Combined Effectiveness” Response Solution – Study 2***

In the “combined effectiveness” condition, the scores from the “most effective” and “least effective” conditions were combined and summed to create a “combined” condition. For each item, the response option achieving the highest PER was identified as the “correct” response and used to score the responses provided by the undergraduate sample for the current study. Scoring procedures provided by Motowidlo et al. (1990) and discussed previously were used to score each item. For each item, a respondent could receive a score ranging from -1, 0 or +1, based on their level of agreement with the experts. Thus, summing the scores across each of the nine items to create an EOPI composite score would result in a total score ranging from -18 to +18.

Next, the psychometric properties of the EOPI composite were evaluated. The results are structured to first evaluate the reliability of the composite, followed by a review of the findings supporting the construct validity of the composite. Then, a review of the empirical results related to the criterion validity of the EOPI composite will be reviewed. In all situations, the initial evaluation of these relationships at the composite level is followed by a similar review at the item level.



### ***Reliability of the EOPI Composite in the “Combined Effectiveness” Condition – Study 2***

Following the assignment of scores to individuals, descriptive statistics, including mean, standard deviation and intercorrelations were calculated for every item (see Table 4).

Intercorrelations among the items were evaluated to determine their level of shared common variance. As shown in Table 4, across 36 intercorrelations, 9 correlations were significant. Item P2 had 3 of the 9 significant relationships, sharing a significant relationship with Items P4 ( $r(188) = .17, p < .05$ ), I2 ( $r(188) = .16, p < .05$ ) and Item R4 ( $r(188) = .20, p < .01$ ). Item P4 shared a significant relationship with Items I2 ( $r(188) = .21, p < .01$ ), I4 ( $r(188) = .24, p < .01$ ) and R4 ( $r(188) = .20, p < .01$ ). Item I2 shared a significant relationship with Item P1 ( $r(188) = .24, p < .01$ ). Item I2 also yielded a significant relationship with Item I4 ( $r(188) = .21, p < .01$ ). Finally, Item I3 showed a significant relationship with Item R2 ( $r(188) = .19, p < .01$ ). This review of the correlation matrix suggests that when the items were correlated, the significant correlations did not occur in a consistent pattern within the a priori specified dimensions, but rather occurred across all of the items, regardless of dimensions. Therefore, rather than exploring a multi-dimensional factor of the EOPI, a unidimensional factor of the measure was explored. To further validate the representativeness of a unidimensional construct in the “combined effectiveness” condition, an exploratory factor analyses was conducted. The scree plot, factor loadings and percentage of variance accounted for by each factor was evaluated to determine the number of factors to retain. A review of the eigenvalues greater than 1 suggested the presence of three factors. However, further examination of the scree plot suggested that the items were better represented by a single factor accounting for a relative modest 20.06% of the variance (see Appendix K). This finding supplemented the findings from the correlation analyses that the EOPI measure was best evaluated as a unidimensional construct. To create a unidimensional EOPI composite, the 9-items on the EOPI in the “combined effectiveness”

condition were summed. As a result, each respondent could receive a total score on the EOPI measure ranging from -18 to +18. When the internal consistency of this unidimensional EOPI composite was evaluated, the alpha coefficient was .45. Item statistics did not suggest that the removal of any of the items from the composite would improve the overall reliability of the construct.

***Construct Validity of the EOPI Composite in the “Combined Effectiveness” Condition – Study 2***

The construct validity of the EOPI measure was evaluated using Stewart’s Entrepreneurial Orientation measure and the measure of Entrepreneurial Self-Efficacy. As supported in the “most effective” condition, these two constructs shared a modest correlation ( $r(188) = .44, p < .01$ ). Correlational analyses revealed non-significant relationships between the EOPI measure and both Stewart’s Entrepreneurial Orientation ( $r(188) = .05, p = \text{n.s.}$ ) and Entrepreneurial Self-Efficacy ( $r(188) = .02, p = \text{n.s.}$ ) measures.

***Construct Validity of the EOPI Items in the “Combined Effectiveness” Condition – Study 2***

Next, each of the EOPI items was individually correlated with Stewart’s Entrepreneurial Orientation measure and the Entrepreneurial Self-Efficacy measure to determine whether individual items showed significant relationships with the two measures. Forward step-wise regression analyses were conducted to determine the extent to which each of the EOPI items were predictive of Entrepreneurial Orientation and Entrepreneurial Self-Efficacy outcomes in the “combined effectiveness” condition. For both Entrepreneurial Orientation and Entrepreneurial Self-Efficacy, no items were significantly predictive of the outcomes. Next, an analysis of the criterion-related validity of the EOPI composite in the “combined effectiveness” condition was evaluated.

## ***Criterion Validity of the EOPI Composite in the “Combined Effectiveness” Condition – Study 2***

Attitude-based measures of Teamwork and Engagement were used to evaluate the criterion validity of the EOPI measure. Correlational analyses yielded a non-significant relationship between the EOPI measure and both Teamwork ( $r(188) = .06, p = \text{n.s.}$ ) and Engagement ( $r(188) = .04, p = \text{n.s.}$ ). As discussed previously in the “most effective” solution, the four biodata items were summed to create a unidimensional Entrepreneurial Behavior construct. Correlational analyses failed to support the EOPI measure as significantly related to the Entrepreneurial Behavior construct ( $r(188) = .05, p = \text{n.s.}$ ). Next, the criterion validity of the EOPI was evaluated on the individual items of the EOPI.

### ***Criterion Validity of the EOPI Items in the “Combined Effectiveness” Condition – Study 2***

Next, each of the EOPI items was individually correlated with the criteria variables to determine if individual items within the measure were predicting the criteria outcomes. Correlational analyses at the item level yielded four significant relationships. Forward step-wise regression analyses were conducted to determine the extent to which each of the EOPI items were predictive of the Teamwork, Engagement and Entrepreneurial Behavior outcomes in the “combined effectiveness” condition. For Teamwork, Item P1 was the only significant item ( $\beta(188) = -.16, t = -2.20, p < .05$ ). No items were predictive of Engagement or Entrepreneurial Behavior.

## ***Discussion – Study 2***

To put the findings for the EOPI measure in context, it is useful to explore how established measures of Entrepreneurship, including Stewart’s Entrepreneurial Orientation measure and the Self-Efficacy measure can effectively evaluate Entrepreneurship. The intercorrelations between Stewart’s measure and the Self-Efficacy measure only correlated at

approximately .44. This suggests that although there is overlap between the constructs, the correlation between the items is generally lower than what would be expected to support convergent validity of similar Entrepreneurship constructs. Thus, the relatively modest relationship suggests that although the items overlap, there is an additional, approximately 80%, of the variance in both constructs that is unique. In addition, a review of the correlations of the Stewart measure and the Self-Efficacy measure with the criteria variables suggests that although the relationships are significant, the magnitude of these correlations were modest for Teamwork, ( $r$ s of .30 for both), Engagement,  $r$ s of .28 and .33, respectively), and Entrepreneurial Behavior,  $r = .27$  (only Stewart's measure). Thus, established measures only yielded modest relationships that account for approximately 10% of the variance in the criteria variables. Further, it cannot be ruled out that these modest significant correlations may be partially or fully capitalizing on mono-method bias, resulting from the self-report, cross-sectional design of the study, which may be overestimating the true magnitude of these relationships (Donaldson & Grant-Vallone, 2002; Spector, 1994). When mono-method bias analysis suggested that the correlations among the Likert-based criteria measures were likely inflated due to the use of a single response option format and the cross sectional design of the study. Thus, beyond the limited results found for the EOPI measure, established measures of Entrepreneurship-related behaviors also seem to be limited in the extent to which they can explain and predict Entrepreneurship-related attitudes and behaviors. In this context, the inconsistent results found using the EOPI are less surprising.

An important finding in Study 2 was the identification of a reliable Entrepreneurial Behavior construct consisting of biodata items. The analyses supported that individuals who had applied for a patent were also more likely to have developed a mission statement, developed a venture name or operated a business. Individually, these items did not have much item variance,

but when aggregated into a composite, the items achieved an internal consistency reliability of .68 (just slightly below the accepted value of .70). In addition, when the intercorrelations between the Entrepreneurial Behavior construct and Stewart's measure of Entrepreneurial Orientation was evaluated, the two yielded a modest, significant relationship. With the addition of more items designed to tap into elements of past entrepreneurial experience, a biodata-based measure of Entrepreneurial Orientation may provide an effective pathway forward to better understand how the construct of Entrepreneurial Orientation can be evaluated. The use of the biodata and other life history items to aid in the prediction of objective Entrepreneurship-based performance outcomes has precedence in the literature across international populations, gender and ethnic populations (Ahl, 2002; Carraher, Carraher, Buckley, 2002; Tankersley, Sadler, Jackson, & Hill, 2004; Hisrich & Brush, 1986; Kibas & K'Aol, 2004; Neider, 1987; Zapalska, 1997). Thus, in the future, replicating the research using a greater number of representative biodata items to more directly evaluate the role of biodata in the measurement of Entrepreneurial Orientation would improve the ability to determine to what extent both the SJT and biodata items are indicators of Entrepreneurial Orientation and independently and collectively contribute to the prediction of entrepreneurial performance. In addition, using more appropriate biodata items for an undergraduate population (e.g., childhood hobbies, high school courses, club involvement, leadership positions, etc.) would also likely improve the ability of a biodata methodology to meaningfully identify convergent and predictive relationships among a student sample.

In the end, the results of the EOPI provided very little support that the current items and composite score provided an effective measure of Entrepreneurship. This finding is not entirely surprising, given the only modest relationships found for alternative, more internally consistent measures of Entrepreneurship, as described previously. The "most effective" condition

performed the worst, failing to reveal any significant relationships at either the unidimensional level or the item level. In the combined condition, the results were modestly better, but these findings were most likely capitalizing on a few noteworthy findings identified in the “least effective” condition.

The “least effective” condition provided some small findings that may help to inform future research seeking to continue to explore any potential that an SJT-based measure may have on evaluating Entrepreneurship. A review of some of the significant intercorrelations of the EOPI at both the construct and item level suggests that having a positive attitude about the importance of teamwork, being engaged in school and having had previous experience in Entrepreneurship are all factors significantly related to choosing the correct response on some of the items. For instance, Item P2 yielded a significant positive relationship with both Teamwork and Engagement. Item P2 presents a scenario in which the respondent is placed in the position of being the owner of a survey management company and needing to make a decision about how to protect him or herself from legal action if company data is compromised. The response option chosen by the expert population as “correct” involved divesting one’s assets in the current company and searching for alternative investment opportunities. Respondents who identified the correct answer also tended to value teamwork and be engaged in their studies. Both Haynie and Shepherd (2005) and Schraw and Moshman (1995) discuss the importance of shared knowledge, meaningful interactions and cognitive adaptability as critical individually-possessed factors related to the development of higher level judgment and reasoning. Similarly, Lin and Chen (2006) found that information sharing among workers within an organization was positively related to product innovation performance. Teamwork and Engagement both reflect working collaboratively with others and exerting physical, emotional and cognitive energy to work more

effectively and resolve problems. Thus, finding that those who have previous experience are also less likely to want to give up, but would rather work collaboratively with others and expend personal energy to find an effective and adaptable solution within the current system, is reasonable.

Similarly, Item P4 was centered on attempting to find an effective way to circumvent the reach of a large, ethically questionable chain store that is threatening your presence within your small community. The response options center around developing different marketing strategies to either promote your community values or attack their inability to behave ethical and socially responsibly. The response option chosen by the expert population as “least effective” involved refocusing one’s marketing and advertising efforts to emphasize the questionable ethical and discriminatory practices of the competitor corporation. Respondents who had previous Entrepreneurship experience were likely to choose this strategy as “least effective”.

Previous research has suggested that comparative advertising, particularly when it is negative, should be used with caution (Burton, 1983; Muehling, 1987). In contrast to non-comparative advertising, comparative advertising is viewed as providing less information, less believable, less friendly and more dishonest than non-comparative advertising (Levine, 1976; Murphy & Amundsen, 1981; Wilson & Muderrisoglu, 1979). Therefore, negative advertising can represent a considerable risk to the developing and maturing small company. Metacognitive and adaptive theories (Haynie & Shepherd, 2009; Schraw & Dennison, 1994; Schraw & Moshman, 1995) suggest that previous experience is likely to facilitate the development of greater knowledge and the selection of a more effective solution. In this situation, those with previous Entrepreneurial experience were able to recognize that engaging in comparative, negative advertisement can have a negative impact on customer perceptions and as such were

able to identify this response as the most ineffective solution. Despite these significant findings, it must be emphasized that the magnitudes of these significant correlations were very small, and the interpretation of these findings should be done with caution. Further, if these findings are indeed meaningful, future research should be conducted to replicate these findings in alternative samples to support their consistency across samples and over time.

Finally, when the intercorrelations between the items were evaluated for the “least effective” response solution, across 36 correlations, 12, or 33%, of the items achieved significant, positive relationships. This would suggest that students who were able to identify ineffective response options on one item also tended to be better able to identify ineffective responses across situations. Although it is unlikely that the response patterns chosen by the students represent Entrepreneurial Orientation, as denoted by the lack of a significant correlation with either Stewart’s Entrepreneurial Orientation measure or the measure of Entrepreneurial Self-Efficacy, it does suggest that the students are answering consistently in relation to some underlying construct. Whether this construct is some aspect of Entrepreneurship at the micro level, random error, or just a mere reflection of cultural similarity should be determined through future research. The idea of these minor significant correlations reflecting some underlying cultural similarity construct would be consistent with the Psychological Characteristics approach to Entrepreneurship discussed by Cunningham and Lischeron (1991).

According to the Psychological Characteristics theory, the values, judgments and preferences of people are generally shaped throughout life and are most heavily influenced by early-to-mid childhood experiences, social interactions with parents, teachers and peers, and cultural and societal norms and expectations. Both the working adult sample and the undergraduate sample consisted of respondents with very similar cultural, societal and



educational backgrounds. As a result, their view and outlook of appropriate and inappropriate business practices are likely to be consistent based on their shared values, morals and expectations. The saliency of ineffective business management practices among the sample may be partially impacted by cultural and societal norms and expectations that form a consistent understanding of “what we do not do”. In turn, this common theme is reflected in their consistent responses in the “least effective” condition on the EOPI.

### ***Limitations/Future Directions– Study 2***

As with any study, there are a number of limitations that can be used to inform future research. Prior to discussing the overall findings of the study, a review of a number of the limitations associated with the two studies will be reviewed. In addition, each will be evaluated to determine how future research efforts can improve upon these limitations.

Using only partial measures of the Stewart Entrepreneurial Orientation measure and the Entrepreneurial-Self Efficacy measure may reduce the ability to generalize findings back to the findings found in those studies. Although 15 of the 18 items from the Stewart measure were included in the current research, and the measure achieved adequate reliability, including the excluded three items would have improved the generalizability of these findings to the findings supported by Stewart. Similarly, the items on the Entrepreneurial Self-Efficacy measure achieved a reliability of .85, suggesting that the items are reliably measuring the construct, despite only using a subset of the items.

In addition, Stewart measured the Proactiveness, Innovativeness and Risk-Taking dimensions as three separate constructs and did not provide an evaluation of an overall measure of Entrepreneurial Orientation. Stewart’s measure suggested that the dimensions were related to various aspects of psychological measures and manager-related performance, but the magnitudes

of these relationships were generally equivalent to what was found in the current study (or slightly less). Similarly, Richard, Barnett, Dwyer and Chadwick (2004) found that the Innovativeness dimension shared a significant relationship with return on equity. Similar results regarding the differential relationships of the Entrepreneurial Orientation dimensions with performance criteria were supported by Lumpkin and Dess (2001). In the future, evaluating the results of the EOPI composite and the Entrepreneurial Behavior composite in relation to the three dimensions of Entrepreneurial Orientation could help to reveal potential relationships that were not captured at the composite level.

Lumpkin and Dess (2001) showed that environmental influences are also likely to influence the relationship of the Entrepreneurial Orientation dimensions and its relationship with the outcomes. According to their findings, Proactiveness likely has the greatest impact on performance during dynamic and rapidly changing environments, whereas Competitive Aggressiveness was more likely to be important in hostile environments or maturing industries. Thus, environmental pressures seemingly play an important, intermediate role in facilitating Entrepreneurship. Evaluating the role of potential moderators and mediators of Entrepreneurial Orientation on these various outcomes would be beneficial going forward.

The criteria variables were empirically evaluated for mono-method bias. The results suggested that the scales that were scored using a Likert-type response option format all loaded on a single factor. This finding would support that both single response option format and the cross-sectional administration of the survey may be potentially influencing (i.e., inflating) the zero-order relationships between and among the criteria variables. In the future using a longitudinal or a multi-method approach to evaluate these various correlates of Entrepreneurial Orientation is likely to provide an important contribution.

The reliability of the dimensions provides a need for caution in the interpretation of the results. The overall EOPI EO construct failed to achieve a reliable internal consistency, yielding values ranging from .32 to .45 across the three response instruction conditions. Findings low internal consistency using an SJT-based methodology is not unique. Ployhart and Ehrhart (2003) reported an internal consistency value for the “most effective” response instruction condition to be .24. Meta-analytically, McDaniel et al. (2001) found that across a wide variety of studies using SJT methodology, the internal consistency values have varied from .43 to .94. Whetzel and McDaniel (2009) have also cited the low internal consistency of SJT items as a major challenge. As a result, Whetzel and McDaniel (2009) suggested that a more appropriate method for evaluating the reliability of an SJT may be through the use of a longitudinal test-retest methodology.

Using the test-retest methodology, the test would be administered again 6-8 weeks later and the responses at Time 1 would be evaluated against the responses at Time 2. A coefficient of stability would be calculated to determine the reliability of the measure. Unfortunately, many of the participants who participate in the research at Time 1 were unable or unwilling to complete the research a second time. In the absence of participants willing to complete the research a second time, the current study was unable to assess the test-retest reliability of the measure in this research. In future research, greater efforts to achieve a sample in which test-retest data can be gathered should be implemented to evaluate the reliability of the EOPI EO measure over time.

Finally, evaluating the research on a more senior student population could improve the extent to which meaningful relationships are found. Although it is reasonable to suggest that students averaging approximately 19 years of age are likely to have significant variance in their

level of Proactiveness, Innovativeness and Risk-Taking, it may be unreasonable to suspect that they have taken entrepreneurship courses, owned/operated a business, applied for a patent/copyright, or had some of the other personal experiences that the biodata items were measuring. This may have limited the variance of the scores on the biodata items, thereby limiting the statistical power to find reliable, valid and meaningful relationships, if they indeed exist. Perhaps conducting the research on a moderate to large sample of junior- or senior-level business students would further support the tri-dimensional structure of the EOPI measure, while also revealing more meaningful relationships between the EOPI dimensions and the Entrepreneurial biodata criteria at both the undimensional and item levels. Especially given that many upper level business students are likely to have a desire to work in managerial positions that require judgment, decision making and the ability to be innovative and proactive, it is reasonable to assume that this research may yield more promising results among this sample population.

### ***Conclusion – Study 2***

Collectively, the findings from Study 2 suggest that in general, the SJT-based EOPI measure did not yield a reliable or valid measure of Entrepreneurial Orientation. Exploratory factor analyses were conducted to explore the feasibility of the EOPI as a multi-dimensional measure. The results failed to support the EOPI as a multi-dimensional construct; and supported that the EOPI was better represented as a unidimensional composite. Yet, this finding seemed to be fairly consistent with the findings of alternative measures of Entrepreneurship attitudes and behaviors used in this study. When the pattern of correlations of the alternative measure of Entrepreneurial Orientation by Stewart (2009) and the measure of Entrepreneurial Self-Efficacy were evaluated with the other criteria measures, the correlations were generally modest.

Broadly, this may reflect a more generalized issue with current measures of Entrepreneurial Orientation and similar measures of closely related Entrepreneurship constructs.

An additional finding of the research supported that the biographical data items may potentially provide an effective pathway to evaluate and measure Entrepreneurial Orientation. Even with only four biodata items, the items were combined to create a marginally reliable Entrepreneurial Behavior composite. This composite yielded a modest, significant correlation with the Stewart's measure of Entrepreneurial Orientation, suggesting that it is likely tapping into some aspect of Entrepreneurial Orientation. The use of the biodata and other life history items to aid in the prediction of objective Entrepreneurship-based performance outcomes has precedence in the literature (Carraher et al., 2002; Tankersley et al., 2004; Kibas & K'ol, 2004). Thus, focusing future research efforts on identifying additional life history factors that reflect past entrepreneurial behaviors may provide a useful pathway forward in Entrepreneurship research.

Finally, if an effort is made to continue with the use of an SJT approach to measure Entrepreneurial Orientation, the results support that some of the items, especially in the "least effective" response condition, may be tapping into some underlying construct related to Entrepreneurship. Therefore, studying individual items and response options within the "least effective" condition may provide a roadmap for the development of future items that may or may not be broadened to evaluate Entrepreneurial Orientation; although the results in this study suggest that the use of any SJT-based methodology or response instruction would likely require significant effort.

## Chapter 7 - General Discussion of Studies 1 and 2

Overall, the results of Study 1 suggests that even among a working adult sample, when instructed to provide the “most effective” response to a challenging Entrepreneurship scenario, students generally have difficulty reaching consensus on the correct rank order of responses. Their ability to reach the consensus on the “least effective” response option is moderately better. This finding suggests individuals are generally better at identifying a single best *ineffective* solution to a business-related problem, but less effective at identifying a single best *effective* solution to a business-related problem. Thus, when using an SJT format to evaluate business-related problems, asking respondents to identify the least effective responses is likely to provide better identification of a “correct” response.

The results of Study 2 failed to support the EOPI instrument as an effective method to evaluate Entrepreneurial Orientation. Across all three conditions, (i.e., “most effective”, “least effective” and “combined”) a review of the intercorrelations between the items suggests that respondents who were able to identify the “correct” solution for one item also identified the “correct response” on alternative items. However, these significant correlations tended to occur across items within the larger subset, rather than within the specified a priori dimensions. This finding suggests that the EOPI was likely to provide more reliable results when the items were summed together to create a unidimensional composite. When the construct and criterion validity of the unidimensional EOPI composite was evaluated on the criteria variables, generally the relationships were non-significant. When there were significant relationships, these most often occurred at the item level and the magnitudes of the significant correlations were generally weak. Overall the results failed to support the EOPI measure as an effective measure of Entrepreneurial Orientation.

This non-significant relationship is less surprising when evaluating the EOPI findings in relation to the findings supported by Stewart's Entrepreneurial Orientation and the measure of Entrepreneurship Self-Efficacy. An evaluation of the pattern of correlation for the EOPI composite in comparison to Stewart's measure and the Entrepreneurship Self-Efficacy measure showed only modest relationships with one another, suggesting a potentially broader measurement issue with currently available measures of Entrepreneurship in general. One potential methodology that may hold promise for understanding the measurement of Entrepreneurial Orientation is the use of biographical data items. In the current study, four items related to life history and participation in entrepreneurial behaviors was found to provide a modestly reliable measure of Entrepreneurial Behavior. In addition, this measure also showed a significant correlation with Stewart's measure of Entrepreneurial Orientation, suggesting that the biodata composite is likely tapping into some aspect of Entrepreneurship. Biodata items have already been used to evaluate Entrepreneurship in the organizational setting (Carragher et al., 2002; Tankersley et al., 2004), but have yet to be evaluated as a method to evaluate Entrepreneurial Orientation. Especially with the addition of similar items designed to correlate with the current biodata items, the verification of biodata items as a method to evaluate Entrepreneurial Orientation may be improved.

If there is hope of using an SJT approach to evaluate Entrepreneurial Orientation, an evaluation of the individual items on the EOPI construct suggested that across the three conditions, there may be some items that are likely tapping into some underlying dimension predictive of Entrepreneurial Behavior. For instance, within the three response conditions, EOPI items designed to evaluate both Proactiveness and Innovativeness seemed to provide very limited evidence of construct and criterion validity with Teamwork, Engagement and Entrepreneurial

Behavior, especially in the “least effective” condition. This finding may suggest that these items are tapping into some underlying aspect construct related to Entrepreneurship. Again, these findings were relatively limited and it cannot be ruled out that they are solely due to chance. In the future, conducting similar research designed to replicate these findings would help to determine whether specific items are tapping into some legitimate overarching construct, or whether these relationships are a result of pure chance, would provide an important contribution.

The inability of the measure to show numerous significant relationships may be partially due to the low internal consistency. Across the 3 conditions, the EOPI measure failed to yield an alpha coefficient exceeding .45. One factor that may be influencing the low reliability is the limited variance associated with the scoring procedures supported by the Motowidlo et al. (1990) method. Using this methodology, response options are weighted -1, 0 or 1 depending on the extent to which the respondent agrees with the “correct” response provided by a sample of experts. This reduced variance limits the extent to which the items can correlate. As suggested by Bergman et al. (2006) and Findlay (2007), exploring alternative scoring methodologies that can improve the covariance among the test items may help to highlight these relationships, if they indeed exist. An additional method to increase the variance among the items is to review items that may be potentially working at the dimensional level and design similar response options that have a greater likelihood to correlate with effective items. Finally, using a hybridized approach that takes into account both the theoretical development of the response option, in addition to the ratings of experts to evaluate and score the SJT items, may be a more effective method to identify the “correct” response option and increase the variance, and thereby, the reliability.



## **Limitations/Future Directions**

The traditional method to develop SJT items requires an iterative approach in which experts are utilized to develop critical incidents, evaluate the effectiveness of the items, provide recommendations for item improvement and assist in the development of appropriate response options. Experts also play a primary role in providing data that can be used to score and weigh the response options for use in subsequent research studies. Considering a number of constraints, the current research implemented a modified version of the in-depth process described previously to develop the EOPI SJT items. A review of entrepreneurship literature, entrepreneurship case studies, situations gathered from a review of news clippings, and conversations with co-workers and fellow graduate students provided the primary basis for the development of the EOPI items. Further, the response options used on the SJT were based primarily on the imagination of the primary researcher and the review of literature, rather than a panel of experts.

Although entrepreneurship and strategic management literatures were consulted prior to the development of the response options, and a panel of three graduate students was used to make modifications to the response options, the extent to which the scenarios and response options are consistent with those that would have been developed by a panel of entrepreneurial experts is unknown. Evaluation and modification of the scenarios with the assistance of experts would help to ensure that the items reflect creative, yet ecologically valid, situations and solutions that better reflect the critical incidents and behavioral responses that can be used to effectively measure Entrepreneurial Orientation.

A panel of 49 working adults provided the basis for developing the weighted scoring key to evaluate the EOPI within the undergraduate sample. Although the workers had participated in some entrepreneurial activities, the extent to which they could be considered to be experts in

Entrepreneurship may be questioned. It would be interesting to see how the scoring key developed by the working adult sample would correspond to one developed by a panel of clearly identified Entrepreneurship experts. Legree et al. (2005) implied that with a larger sample approaching 200, the “correct” response identified by journeymen (non-experts with a modest degree of expertise) would correlate at approximately .70 with the “correct” response identified by experts. With only an expert sample of 49, perhaps the identification of the correct answer does not approximate that that would be chosen by a sample of experts. Thus, conducting this research using entrepreneur experts as the primary drivers of the response options and the scoring key would provide a useful comparison sample in future research.

The wording of the response instructions may partially explain the inability of the EOPI measure to find meaningful relationships, if they indeed exist. McDaniel et al. (2007) and Whetzel and McDaniel (2009) discussed the potential moderating role of response option instructions on the content and criterion validity of the SJT testing methodology. SJT response option can be designed to evaluate either knowledge- or behavioral tendency. Knowledge-based response instructions ask respondents to select the option that represents the “best”, “correct” or “effective” response to resolve the scenario. In contrast, behavioral tendency response instructions ask respondents to select the option that represents the behavioral action that they would most likely take in response to the scenario.

Both a behavioral tendency response format (e.g., what would you do) and a knowledge-based response format (i.e., what is the most /least effective) carry advantages and disadvantages in interpreting their results. Specifically, McDaniel et al. (2007) and Whetzel and McDaniel (2009) suggested that both response formats vary in the extent to which they can show incremental predictive validity above alternative testing methodologies, measure unique

constructs independent of cognitive ability or personality, and can show that they are less susceptible to impression management, self-deception and distortion. Therefore, in future administration of the test, varying the response instructions and comparing the results of response instruction on the overall psychometric properties of the measure would provide a meaningful and important contribution.

Research suggests that the response instruction format used can affect the reliability and validity of an SJT measure (Whetzel & McDaniel, 2009). For instance, Ployhart and Ehrhart (2003) evaluate the internal consistency of a variety of response option instruction formats and found that rating the effectiveness of each response option yielded alpha values exceeding .70. Best/Worst response instructions had alpha reliabilities around .60 and most/least effective response instructions yielded internal consistency of .24.

In the current study, a most/least effective response option was used to evaluate each scenario. To the extent that the respondent's idea of what was the most effective response option is consistent with the behavioral action that they would take, there is consistency between their ratings and their actual behavior. Yet, some people who are high in Risk-Taking, for example, may realize that risk does not always denote the most effective, and as such, may have tempered their responses on the EOPI measure to include more traditional responses. In the future, replicating the study using a more behavioral-based format (e.g., what would you do) versus the current knowledge-based format (i.e., most/least effective) could provide insight into how actual behavioral responses support the reliability and construct validity of the EOPI measure.

As discussed prior, the traditional method for scoring SJTs is using a process similar to that provided by Motowidlo et al. (1990). This method requires experts to identify which response option is "best/worst" or most/least effective" and then scoring respondents' answers by

assigning values of +1 for responses that are consistent with those endorsed by the experts, -1 for responses that are inconsistent with those provided by the experts, and 0 for responses that were neither supported nor unsupported by the experts. Thus, for each SJT item, respondents can receive a score ranging between +2 and -2. Alternatively, some researchers have discussed various methods to integrate the responses provided by experts with empirical approaches (Bergman et al., 2006) or combining expert opinions with those of a large respondent population (Findlay, 2007) to develop hybridized scoring keys. Bergman et al. suggested that alternative weighting procedures may impact the scoring and psychometric properties of SJT-based testing items. Evaluating the effect of differential weighting methods of the response options on the construct and criterion validity of the measure would provide a meaningful question in future research.

A primary argument for using an SJT methodology to evaluate psychological constructs is its ability to predict individual performance behavior above and beyond more traditional methodologies, such as cognitive ability- and personality-based measures, of the same construct. Unfortunately, the current research failed to find many significant relationships and therefore evaluating the incremental prediction of the EOPI SJT items above and beyond that of Stewart's (2009) attitude-based measure of Entrepreneurial Orientation could not be conducted. In the future, a larger working sample is likely to enhance the ability to evaluate the incremental contributions of the EOPI SJT dimensions, if any exist.

## **Conclusion**

The identification and retention of entrepreneurial talent is important for a variety of reasons. First, research has shown that Entrepreneurship represents a primary method through which job creation is accelerated (Athayde, 2008). Entrepreneurs create jobs, introduce novel

products to the market, and provide a pathway for a society to raise its economic, social and global standing that allows for overall wealth creation and generation. Second, within organizations, employees displaying proactive, innovative and risk-taking behaviors represent a human capital advantage that cannot be easily replicated. Organizations that can successfully capitalize on their employees' entrepreneurial-oriented abilities can pursue broader and more advanced organizational goals and objectives designed to improve the ability of the organizations to aggressively compete in an unstable and volatile market. Using a situational judgment test methodology, the current research attempted to explore this gap and use a SJT testing methodology to evaluate individual entrepreneurial orientation among two independent samples: a working adult sample and a student sample. Although limited, the findings suggest that, with additional work, specific items on the EOPI may provide a potential starting point for the development of future scenarios and response options, especially when a "least effective" response option instruction approach is used.

Across a variety of Entrepreneurship-related measures, the results potentially suggest a broader issue with the measurement of Entrepreneurship-related attitudes and behavior at the individual level. Across the three measures, even when significant relationships were found, the magnitudes of these relationships were generally small to modest. Assuming that these measures are all tapping into some aspect of Entrepreneurship, moderate relationships would be expected across these items. Thus, it seems that some of the confusion that plagues Entrepreneurship research at the conceptual level (Bryat & Julien, 2000; Bull & Willard, 1993; Cunningham & Lischeron, 1991; Gartner, 1989, 1990; McCline et al., 2000; Sexton, 2001; Virtanen, 1997) is indeed reflected in current measures of Entrepreneurship. Greater clarification about Entrepreneurship is needed if effective measurement instruments are to be developed.

The current research does provide insight into the potential advantage of using historical life experiences as a testing methodology to measure and predict Entrepreneurial Orientation. In the current study, a unidimensional biodata-based measure of Entrepreneurial Orientation was found to be both marginally reliable and significantly related to an alternative measure of Entrepreneurial Orientation. The development of additional biodata items that correlate with the current items is likely to improve the psychometric properties of the Entrepreneurial Orientation composite and provide insight into the role of previous experience as a valid and reliable indicator of Entrepreneurial Orientation and Entrepreneurship behaviors.

## Chapter 8 - References

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**Table 1**

**Group 1 and Group 2 Agreement Analysis for “Most Effective” Proactiveness Response Option Condition**

GROUP 1 (N = 26)				GROUP 2 (N = 23)				OVERALL		
ITEM	# SELECTED	PER	RANK	ITEM	# SELECTED	PER	RANK	RDS	OVERALL RDS	AGREE/ DISAGREE
P1				P1						
R1	12	0.44	4	R1	13	0.54	4	0		
R2	8	0.30	3	R2	2	0.08	2	1		
R3	1	0.04	1	R3	7	0.29	3	2		
R4	5	0.19	2	R4	1	0.04	1	1	4	DISAGREE
P2				P2						
R1	2	0.07	1	R1	1	0.04	1	0		
R2	13	0.48	4	R2	11	0.46	4	0		
R3	3	0.11	2	R3	5	0.21	2	0		
R4	8	0.30	3	R4	6	0.25	3	0	0	AGREE
P3				P3						
R1	1	0.04	1	R1	0	0.00	1	0		
R2	6	0.22	2	R2	4	0.17	3	1		
R3	10	0.37	4	R3	2	0.08	2	2		
R4	9	0.33	3	R4	17	0.71	4	1	4	DISAGREE
P4				P4						
R1	3	0.11	2	R1	3	0.13	3	1		
R2	15	0.56	4	R2	17	0.71	4	0		
R3	1	0.04	1	R3	1	0.04	1	0		
R4	7	0.26	3	R4	2	0.08	2	1	2	AGREE

NOTE: P = Proactiveness; I = Innovativeness; R = Risk-Taking; PER = Proportional Endorsement Rate; RDS = Rank Differential Score

NOTE: PER calculated by taking the # Selected/Total Group N

NOTE: RDS calculated by subtracting PER rank in Group 1 from PER rank in Group 2 and taking absolute value  
Items with an RDS value > 3 were discarded

NOTE: Overall RDS calculated by summing RDSs for each response item

**Table 1 Continued**

**Group 1 and Group 2 Agreement Analysis for “Most Effective” Innovativeness Response Option Condition**

GROUP 1 (N = 26)				GROUP 2 (N = 23)				OVERALL		
ITEM	# SELECTED	PER	RANK	ITEM	# SELECTED	PER	RANK	RDS	OVERALL RDS	AGREE/ DISAGREE
I1				I1						
R1	6	0.22	3	R1	7	0.29	3	0		
R2	10	0.37	4	R2	2	0.08	1	3		
R3	5	0.19	1.5	R3	8	0.33	4	2.5		
R4	5	0.19	1.5	R4	6	0.25	2	0.5	6	DISAGREE
I2				I2						
R1	13	0.48	4	R1	13	0.54	4	0		
R2	10	0.37	3	R2	8	0.33	3	0		
R3	2	0.07	2	R3	0	0.00	1	1		
R4	1	0.04	1	R4	2	0.08	2	1	2	AGREE
I3				I3						
R1	13	0.48	4	R1	6	0.25	3	1		
R2	5	0.19	2	R2	3	0.13	2	0		
R3	6	0.22	3	R3	12	0.50	4	1		
R4	2	0.07	1	R4	2	0.08	1	0	2	AGREE
I4				I4						
R1	7	0.26	2.5	R1	9	0.38	3	0.5		
R2	7	0.26	2.5	R2	2	0.08	2	0.5		
R3	1	0.04	1	R3	0	0.00	1	0		
R4	11	0.41	4	R4	12	0.50	4	0	1	AGREE

NOTE: P = Proactiveness; I = Innovativeness; R = Risk-Taking; PER = Proportional Endorsement Rate; RDS = Rank Differential Score

NOTE: PER calculated by taking the # Selected/Total Group N

NOTE: RDS calculated by subtracting PER rank in Group 1 from PER rank in Group 2 and taking absolute value  
Items with an RDS value > 3 were discarded

NOTE: Overall RDS calculated by summing RDSs for each response item

**Table 1 Continued**

**Group 1 and Group 2 Agreement Analysis for “Most Effective” Risk-Taking Response Option Condition**

GROUP 1 (N = 26)				GROUP 2 (N = 23)				OVERALL		
ITEM	# SELECTED	PER	RANK	ITEM	# SELECTED	PER	RANK	RDS	OVERALL RDS	AGREE/ DISAGREE
R1				R1						
	R1	9	0.33	3		R1	6	0.25	3	0
	R2	10	0.37	4		R2	5	0.21	2	2
	R3	1	0.04	1		R3	0	0.00	1	0
	R4	6	0.22	2		R4	12	0.50	4	2
									4	<b>DISAGREE</b>
R2				R2						
	R1	1	0.04	1		R1	0	0.00	1	0
	R2	12	0.44	4		R2	9	0.38	3	1
	R3	9	0.33	3		R3	11	0.46	4	1
	R4	4	0.15	2		R4	3	0.13	2	0
									2	<b>AGREE</b>
R3				R3						
	R1	13	0.48	4		R1	9	0.38	4	0
	R2	4	0.15	2		R2	4	0.17	2	0
	R3	6	0.22	3		R3	2	0.08	1	2
	R4	3	0.11	1		R4	8	0.33	3	2
									4	<b>DISAGREE</b>
R4				R4						
	R1	12	0.44	4		R1	12	0.50	4	0
	R2	7	0.26	3		R2	7	0.29	3	0
	R3	2	0.07	1		R3	2	0.08	1.5	0.5
	R4	5	0.19	2		R4	2	0.08	1.5	0.5
									1	<b>AGREE</b>

NOTE: P = Proactiveness; I = Innovativeness; R = Risk-Taking; PER = Proportional Endorsement Rate; RDS = Rank Differential Score

NOTE: PER calculated by taking the # Selected/Total Group N

NOTE: RDS calculated by subtracting PER rank in Group 1 from PER rank in Group 2 and taking absolute value

Items with an RDS value > 3 were discarded

NOTE: Overall RDS calculated by summing RDSs for each response item

**Table 2**

**Group 1 and Group 2 Agreement Analysis for “Least Effective” Proactiveness Response Option Condition**

GROUP 1 (N = 26)				GROUP 2 (N = 23)				OVERALL		
ITEM	#	PER	RANK	ITEM	#	PER	RANK	RDS	OVERALL	AGREE/ DISAGREE
	SELECTED				SELECTED				RDS	
P1				P1						
R1	1	0.04	1	R1	2	0.08	1	0		
R2	8	0.30	3	R2	4	0.17	2	1		
R3	7	0.26	2	R3	8	0.33	3	1		
R4	10	0.37	4	R4	9	0.38	4	0	2	AGREE
P2				P2						
R1	14	0.52	4	R1	15	0.63	4	0		
R2	4	0.15	2	R2	3	0.13	2.5	0.5		
R3	4	0.15	2	R3	3	0.13	2.5	0.5		
R4	4	0.15	2	R4	2	0.08	1	1	2	AGREE
P3				P3						
R1	19	0.70	4	R1	18	0.75	4	0		
R2	1	0.04	1	R2	4	0.17	3	2		
R3	4	0.15	3	R3	1	0.04	2	1		
R4	2	0.07	2	R4	0	0.00	1	1	4	DISAGREE
P4				P4						
R1	5	0.19	3	R1	2	0.08	2	1		
R2	1	0.04	1	R2	0	0.00	1	0		
R3	16	0.59	4	R3	17	0.71	4	0		
R4	4	0.15	2	R4	4	0.17	3	1	2	AGREE

NOTE: P = Proactiveness; I = Innovativeness; R = Risk-Taking; PER = Proportional Endorsement Rate; RDS = Rank Differential Score

NOTE: PER calculated by taking the # Selected/Total Group N

NOTE: RDS calculated by subtracting PER rank in Group 1 from PER rank in Group 2 and taking absolute value  
Items with an RDS value > 3 were discarded

NOTE: Overall RDS calculated by summing RDSs for each response item

**Table 2 Continued**

**Group 1 and Group 2 Agreement Analysis for “Least Effective” Innovativeness Response Option Condition**

GROUP 1 (N = 26)				GROUP 2 (N = 23)				OVERALL		
ITEM	# SELECTED	PER	RANK	ITEM	# SELECTED	PER	RANK	RDS	OVERALL RDS	AGREE/ DISAGREE
I1				I1						
R1	4	0.15	1	R1	5	0.21	2.5	1.5		
R2	5	0.19	2	R2	5	0.21	2.5	0.5		
R3	8	0.30	3	R3	4	0.17	1	2		
R4	9	0.33	4	R4	9	0.38	4	0	4	<b>DISAGREE</b>
I2				I2						
R1	5	0.19	2.5	R1	0	0.00	1	1.5		
R2	1	0.04	1	R2	3	0.13	2	1		
R3	15	0.56	4	R3	12	0.50	4	0		
R4	5	0.19	2.5	R4	8	0.33	3	0.5	3	<b>AGREE</b>
I3				I3						
R1	2	0.07	1	R1	2	0.08	1	0		
R2	10	0.37	4	R2	11	0.46	4	0		
R3	6	0.22	2	R3	3	0.13	2	0		
R4	8	0.30	3	R4	7	0.29	3	0	0	<b>AGREE</b>
I4				I4						
R1	6	0.22	3	R1	1	0.04	1.5	1.5		
R2	2	0.07	2	R2	4	0.17	3	1		
R3	17	0.63	4	R3	17	0.71	4	0		
R4	1	0.04	1	R4	1	0.04	1.5	0.5	3	<b>AGREE</b>

NOTE: P = Proactiveness; I = Innovativeness; R = Risk-Taking; PER = Proportional Endorsement Rate; RDS = Rank Differential Score

NOTE: PER calculated by taking the # Selected/Total Group N

NOTE: RDS calculated by subtracting PER rank in Group 1 from PER rank in Group 2 and taking absolute value  
Items with an RDS value > 3 were discarded

NOTE: Overall RDS calculated by summing RDSs for each response item



**Table 2 Continued**

**Group 1 and Group 2 Agreement Analysis for “Least Effective” Risk-Taking Response Option Condition**

GROUP 1 (N = 26)				GROUP 2 (N = 23)				OVERALL		
ITEM	# SELECTED	PER	RANK	ITEM	# SELECTED	PER	RANK	RDS	OVERALL RDS	AGREE/ DISAGREE
R1				R1						
R1	4	0.15	2	R1	5	0.21	2.5	0.5		
R2	2	0.07	1	R2	5	0.21	2.5	1.5		
R3	14	0.52	4	R3	13	0.54	4	0		
R4	6	0.22	3	R4	0	0.00	1	2	4	DISAGREE
R2				R2						
R1	14	0.52	4	R1	14	0.58	4	0		
R2	5	0.19	3	R2	5	0.21	3	0		
R3	4	0.15	2	R3	3	0.13	2	0		
R4	3	0.11	1	R4	1	0.04	1	0	0	AGREE
R3				R3						
R1	0	0.00	1	R1	2	0.08	1	0		
R2	9	0.33	2	R2	5	0.21	3	1		
R3	11	0.41	4	R3	12	0.50	4	0		
R4	6	0.22	3	R4	4	0.17	2	1	2	AGREE
R4				R4						
R1	1	0.04	1	R1	1	0.04	2	1		
R2	4	0.15	2	R2	0	0.00	1	1		
R3	7	0.26	3	R3	9	0.38	3	0		
R4	14	0.52	4	R4	13	0.54	4	0	2	AGREE

NOTE: P = Proactiveness; I = Innovativeness; R = Risk-Taking; PER = Proportional Endorsement Rate; RDS = Rank Differential Score

NOTE: PER calculated by taking the # Selected/Total Group N

NOTE: RDS calculated by subtracting PER rank in Group 1 from PER rank in Group 2 and taking absolute value

Items with an RDS value > 3 were discarded

NOTE: Overall RDS calculated by summing RDSs for each response item

**Table 3**

**Means, Standard Deviations and Intercorrelations of EOPI Items and Study Variables for “Most Effective”  
Condition (N = 188)**

VARIABLE	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 ITEM P2	.18	.72	---													
2 ITEM P4	.37	.70	.04	---												
3 ITEM I2	.19	.67	.11	.07	---											
4 ITEM I3	.21	.77	-.11	-.02	.11	---										
5 ITEM I4	.10	.62	.03	.15*	.12	.02	---									
6 ITEM R2	.23	.72	-.02	.15*	.16*	.16*	.07	---								
7 ITEM R4	.30	.71	.01	.17*	.10	.02	.03	.01	---							
8 EOPI - EO	1.53	2.19	.36**	.52**	.53**	.40**	.40**	.49**	.44**	<b>.32</b>						
9 STEWART - EO	66.05	8.02	-.13	-.01	-.01	.06	-.02	.10	.03	.03	<b>.70</b>					
10 ENTREPRENEURIAL SELF-EFFICACY	48.57	7.69	-.03	-.05	.02	.05	-.02	.00	.01	-.05	.44**	<b>.85</b>				
11 TEAMWORK	32.99	5.91	-.05	.03	-.10	.05	-.01	.03	.08	-.01	.30**	.30**	<b>.81</b>			
12 TURNOVER	7.41	4.44	-.02	-.07	.02	-.14*	-.02	-.12	.03	-.11	-.09	.03	-.25**	<b>.91</b>		
13 ENGAGEMENT	43.92	8.37	-.05	-.05	-.07	.08	-.01	.10	-.12	-.03	.28**	.33**	.23**	-.23**	<b>.88</b>	
14 ENTREPRENEURIAL BEHAVIOR	4.48	1.08	.04	-.03	-.05	-.02	-.06	-.09	.13	-.02	.27*	.06	.11	.05	.12	<b>.68</b>

NOTE:EOPI - EO = Entrepreneurial Orientation Profile Inventory;  
STEWART - EO = Stewart (2009) Entrepreneurial Orientation

**Table 4**

**Means, Standard Deviations and Intercorrelations of EOPI Items and Study Variables for “Least Effective” Condition (N = 188)**

VARIABLE	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 ITEM P1	.13	.63	---															
2 ITEM P2	.22	.72	.20**	---														
3 ITEM P4	.25	.65	.11	.19**	---													
4 ITEM I2	.29	.68	.20**	.19*	.19*	---												
5 ITEM I3	.10	.79	.05	-.02	-.03	.00	---											
6 ITEM I4	.31	.70	.02	.16*	.25**	.18*	.05	---										
7 ITEM R2	.18	.68	.08	.17*	.06	.04	.10	.05	---									
8 ITEM R3	.13	.70	-.01	.00	.04	.04	.19**	.17*	-.12	---								
9 ITEM R4	.27	.68	.13	.25**	.07	.05	.04	.00	-.03	.03	---							
10 EOPI - EO	1.87	2.68	.43**	.55**	.47**	.47**	.39**	.49**	.35**	.35**	.39**	<b>.45</b>						
11 STEWART - EO	66.05	8.02	.00	.10	.14	.00	.13	.02	.05	-.02	-.03	.11	<b>.70</b>					
12 ENTREPRENEURIAL SELF-EFFICACY	48.57	7.69	.01	.05	.10	-.05	.10	.04	.03	-.05	.10	.09	.44**	<b>.85</b>				
13 TEAMWORK	32.99	5.91	-.05	.15*	.10	.01	.09	.10	.12	.03	.06	.16*	.30**	.30**	<b>.81</b>			
14 TURNOVER	7.41	4.44	.10	-.08	-.05	.00	-.11	-.05	-.09	-.10	.04	-.09	-.09	.03	-.25**	<b>.91</b>		
15 ENGAGEMENT	43.92	8.37	-.02	.20**	.06	-.10	-.02	.13	.09	.00	.11	.11	.28**	.33**	.23**	-.23**	<b>.88</b>	
16 ENTREPRENEURIAL BEHAVIOR	4.48	1.08	-.03	.03	.17*	.00	.04	.09	.03	.02	.07	.11	.27*	.06	.11	.05	.12	<b>.68</b>

NOTE:EOPI - EO = Entrepreneurial Orientation Profile Inventory;  
 STEWART - EO = Stewart (2009) Entrepreneurial Orientation

**Table 5**

**Means, Standard Deviations and Intercorrelations of EOPI Items and Study Variables for “Combined Effectiveness” Condition (N = 188)**

VARIABLE	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 ITEM P1	.45	1.04	---															
2 ITEM P2	.40	1.14	.07	---														
3 ITEM P4	.62	1.09	.04	.17*	---													
4 ITEM I2	.48	1.14	.24**	.16*	.21**	---												
5 ITEM I3	.31	1.35	.08	-.05	-.02	.11	---											
6 ITEM I4	.41	1.04	.05	.13	.24**	.21**	.04	---										
7 ITEM R2	.41	1.09	.09	.09	.11	.12	.19**	.11	---									
8 ITEM R3	.24	1.18	-.08	.01	.01	.02	.03	.06	-.03	---								
9 ITEM R4	.57	1.14	.01	.20**	.20**	.12	.05	.05	-.04	.01	---							
10 EOPI – EO	3.89	4.39	.37**	.45**	.49**	.56**	.42**	.47**	.42**	.28**	.41**	<b>.45</b>						
11 STEWART – EO	66.05	8.02	-.03	-.02	.08	.00	.11	.00	.09	-.03	.00	.05	<b>.70</b>					
12 ENTREPRENEURIAL SELF-EFFICACY	48.57	7.69	-.11	.01	.03	-.02	.09	.01	.02	-.03	.07	.02	.44**	<b>.85</b>				
13 TEAMWORK	32.99	5.91	-.16*	.06	.08	-.05	.08	.06	.10	-.05	.08	.06	.30**	.30**	<b>.81</b>			
14 TURNOVER	7.41	4.44	.15*	-.06	-.08	.01	-.14*	-.04	-.13	-.04	.04	-.08	-.09	.03	-.25**	<b>.91</b>		
15 ENGAGEMENT	43.92	8.37	-.04	.09	.00	-.10	.03	.08	.12	-.02	-.01	.04	.28**	.33**	.23**	-.23**	<b>.88</b>	
16 ENTREPRENEURIAL BEHAVIOR	4.48	1.08	-.08	.04	.08	-.03	.02	.03	-.04	.06	.12	.05	.27*	.06	.11	.05	.12	<b>.68</b>

NOTE:EOPI - EO = Entrepreneurial Orientation Profile Inventory;  
 STEWART - EO = Stewart (2009) Entrepreneurial Orientation

# Appendix A

## Graduate Student Formalized Scenario Item Review Survey

### *Scenario Review Instructions/Procedures*

Dear Reviewer,

Thank you for agreeing to participate in this research. Your involvement will be beneficial in developing scenarios that can be used to help differentiate among successful and unsuccessful entrepreneurs. On average, this survey has taken 20-25 minutes to complete.

The Institutional Review Board (IRB) at Kansas State University has approved this research (Application #5638) and you can contact the Chairperson Rick Scheidt (rscheidt@ksu.edu or 785-532-3224) with relevant ethical questions or concerns. If you have any questions, comments, or concerns regarding the content or administration of this research, please contact Michael R. Smith (mrs5628@ksu.edu or 785-341-1980) or Dr. Ronald G. Downey (downey@ksu.edu or 785-532-5475).

#### **Opening Instructions:**

Thank you for agreeing to serve as an evaluator of the scenarios that will be used in my dissertation project. In the following, you will be presented with 18 scenarios designed to capture meaningful real-life business and entrepreneurial situations. For each scenario, you will also be asked to evaluate four response options that have been developed as behavioral actions that can be used to adequately address each situation. Please provide your honest opinion so that I can improve the quality of the scenarios and the response options.

#### **SCENARIOS:**

First, you will first be asked to rate each of the 18 business-related scenarios. The first six scenarios measure proactiveness, the next six scenarios measure risk-taking and the final six scenarios measure innovativeness. You will be asked to provide your thoughts on how each of the scenarios can be improved.

#### **RESPONSE OPTIONS:**

Following each scenario, you will find four behavioral response options that represent actions that the participant can take to resolve the situation. The participants will be asked to select the best and the worst response options for each. The response options were designed to measure an underlying continuum, such that the 1st response option should represent the mildest level of proactiveness, innovativeness or risk taking and the 4th response option should represent the most extreme level of each characteristic. The complete ranking of each response option is as follows:

*1st response option:* Slightly conventional response to the situation that shows a mild level of initiative, originality, or risk

**2nd response option:** Conventional response to the situation that shows a intermediate level of initiative, originality, or risk

**3rd response option:** Unconventional response to the situation that shows a high level of initiative, originality, or risk

**4th response option:** Extremely unconventional response to the situation that shows an extreme level of initiative, originality, or risk

You will be asked to review each of the four response options and provide your evaluation to which each of the four response options represents a mild, intermediate, high or substantial level of proactiveness, innovativeness or risk-taking.

For each response option, please judge to what extent the response option fits the standard defined above, using the 5-point Likert scale from (1-Strongly Disagree to 5- Strongly Agree).

**Thank you for your time and participation!**

## **SAMPLE SJT ITEM RATING USED BY GRADUATE STUDENT REVIEWERS**

### **PROACTIVENESS SCENARIO #1:**

You are the owner of a successful hot air balloon service. Recently, while reviewing your financial books you have noticed a number of trends that indicate that the economic market is beginning to destabilize. First, your ridership is declining, second, your fuel cost is rising, and finally your out-of-pocket expenses are beginning to slowly escalate. Economist speculate that, “depending on the financial decisions your government enacts, the length of the recession can range anywhere between ‘a few months’ to ‘a few years’”. Currently, your savings will allow you to continue to run your business for 3 or 4 months, but if the economic instability persists for a longer period of time, it will be difficult to continue operating your business.

***Of the following response options, please select "1" for the option that you would most likely take and "2" for the option that you would least likely take:***

Focus your marketing efforts on promoting your service as a stress reliever and method to improve personal well-being

Contact your suppliers and distributors to determine whether your current rates can be renegotiated to account for the economic conditions

Implement a moderate price increase now to increase your available operating budget during more difficult times

Offer discounted long-term rates and specialty packages to raise capital and ensure long-term commitments from clients

2. Please provide your judgment regarding the extent to which the response option fits the standard defined for Proactiveness Scenario #1.

1 - Strongly Disagree | 2 - Disagree  
3 - Neither Agree nor Disagree | 4 - Agree | 5 - Strongly Agree

Response Option #1 represents a mild level of initiative?

1 2 3 4 5

Response Option #2 represents an intermediate level of initiative?

1 2 3 4 5

Response Option #3 represents a high level of initiative?

1 2 3 4 5

Response Option #4 represents an extreme level of initiative?

1 2 3 4 5

3. Please provide your suggestions on how Proactiveness Scenario #1 can be improved:

## Appendix B

### Listing of SJT Scenario Items and Associated Randomized Response Options

#### *Proactiveness Scenarios*

##### **PROACTIVENESS SCENARIO #1:**

You are the owner of a successful hot air balloon service. Recently, while reviewing your financial books you have noticed a number of trends that indicate that the economic market is beginning to destabilize. First, your ridership is declining, second, your fuel cost is rising, and finally your out-of-pocket expenses are beginning to slowly escalate. Economists speculate that, “depending on the financial decisions your government enacts, the length of the recession can range anywhere between ‘a few months’ to ‘a few years’”. Currently, your savings will allow you to continue to run your business for 3 or 4 months, but if the economic instability persists for a longer period of time, it will be difficult to continue operating your business.

*Of the following response options, please select "1" for the option that you would most likely take and "2" for the option that you would least likely take:*

Contact your suppliers and distributors to determine whether your current rates can be renegotiated to account for the economic conditions

Offer discounted long-term rates and specialty packages to raise capital and ensure long-term commitments from clients

Implement a moderate price increase now to increase your available operating budget during more difficult times

Focus your marketing efforts on promoting your service as a stress reliever and method to improve personal well-being

##### **PROACTIVENESS SCENARIO #2:**

You are the owner of a survey management company. You work hard and over time have developed a few loyal clients who go to you for all of your survey-related needs. Currently, the company you have contracted with to host and provide data security for your surveys has recently come under fire for some data security and theft issues.

You have been doing business with your current service provider for many years and although you initially had some issues with the company, none of your data has been significantly compromised within the last year. With the influx of identification theft, congressional legislation has been drafted that would make it possible to hold accountable both your security management company and your consulting firm for data compromises.

Although you do not have the expertise on hand to host and secure data, you wonder whether your company should implement a total integration of your data collection, analysis, and security processes or work with your client to increase data security operations.

*Of the following response options, please select "1" for the option that you would most likely take and "2" for the option that you would least likely take:*



Begin divesting your company's assets and look for alternative investment opportunities

Work with your current service provider to develop higher level security procedures and practices

Hire your own internal expert and initiate a total integration of all your data collection and security processes

Switch to a more secure and trusted contractor despite the potential for higher monthly data security costs

### **PROACTIVENESS SCENARIO #3:**

As the owner of a small motel, you are interested in cutting costs. You analyze your costs and note that a significant amount of your yearly capital is benchmarked for dry cleaning services. You project that if you are able to reduce your monthly laundering costs by even a few dollars per load, this could result in a yearly saving of a few thousand dollars.

A competitor launder service is aggressively seeking business and is willing to offer you two months free, in addition to a steep 6-month discounted rate if you are willing to sign a long-term contract. You have a fifteen-year professional and personal relationship with your dry cleaning service provider, and are one of his primary customers. As a result, changing your launder provider would be a significant blow to his business. In the past, because of your long standing relationship and loyalty, he has treated you well and held your prices constant even when he was increasing his prices for others. In addition, he has never asked you to sign a contract and has shown to be very flexible with you when you have lacked the capital to make your payments on time.

*Of the following response options, please select "1" for the option that you would most likely take and "2" for the option that you would least likely take:*

Switch to a competitor launder service provider and sign a long-term contract

Reduce the number of laundry cycles that occur within a given month

Focus on reducing cost by focusing on some other area, such as staffing or inventory

Attempt to renegotiate your current per/load rate with your current launder provider

### **PROACTIVENESS SCENARIO #4:**

As the owner of a community-based electronic store, you have garnered respect and admiration for your community involvement and philanthropy. In addition, you have been lauded for your ability to develop a quality product and your unmatched 6-month in-store service repair warranty.

In three months, a large chain store will open across the street from you and has already started an aggressive 9-month extended warranty service with at-home service repairs warranty campaign aimed at garnering your market share. This chain store is engaged in numerous litigation resulting from its "questionable ethics and discriminatory practices" and is notorious for using aggressive marketing practices to drive small, competing hometown stores out of business.

Although your business has been steady and you have many clients who have been loyal to you for many years, you realize that the strategy employed by your competition represents a significant threat to your long-term business success.

*Of the following response options, please select "1" for the option that you would most likely take and "2" for the option that you would least likely take:*

Extend your service warranty to 12-months with at home service repairs

Refocus your advertising efforts to highlight your superior craftsmanship and community roots and values

Emphasize the questionable ethical and discriminatory practices of the large chain store in your advertising

Negotiate with the leaders of the chain store to become the primary supplier and service repairer of your product

### ***Innovativeness Scenarios***

#### **INNOVATIVENESS SCENARIO #1:**

You are the developer of an assortment of needles, syringes and wires designed for health care use, but are also beneficial in the chemical sciences, vehicle and sporting goods industry for various uses. Your service contracts are inconsistent and at times there may not be meaningful work for a few months, followed by sharp increases in demand and production. In addition, you are unable to offer any substantial employee benefits.

Due to the inconsistent nature of the work and the lack of benefits, you have very high turnover and find it difficult to hire employees who are willing to effectively deal with the uncertainty. The major personal characteristics that are important for the job are responsibility, dependability, ability to concentrate and open schedule availability to work during periods of high demand.

***Of the following response options, please select "1" for the option that you would most likely take and "2" for the option that you would least likely take:***

Develop a partnership with the local temporary employment agency to identify a potential employee pool

Hire a number of previously retired employees who are willing to work on a part-time basis

Contract the work to two or three on-call employees who are provided a yearly retainer salary

Work with counselors at the local high school to set up an apprenticeship program for graduating high school seniors

#### **INNOVATIVENESS SCENARIO #2:**

Since childhood, you have always been interested in the use of electronics and the design and engineering of model cars. During college, your passion for art, psychology, electronics, and cars resulted in you developing a protocol for a car simulator that is currently being used to train and improve teen safety driving behaviors and habits. From the beginning, your work has gained a significant level of popularity in academic circles and you have achieved a moderate level of professional respect and success and financial standing.

More recently, the popular mass media market has started to take note of your simulator and a number of companies have requested to use your product in some popular advertising campaigns and movies, and develop a line of toys based on your models and simulations. You know that allowing your work to be franchised will result in significant financial gain and mass popularity that may help create greater funding opportunities, but you also understand that it is likely to undermine the respect and admiration that you have worked so hard to get among your academic peers.

***Of the following response options, please select "1" for the option that you would most likely take and "2" for the option that you would least likely take:***

Attempt to negotiate a reduced financial package in exchange for being allowed input into how the product is marketed

Partner with a trusted business colleague and begin developing, marketing and selling your products on your own

Accept the offer from the toy company and relinquish control of your products

Refuse the current offers and test the market for alternative deals

### **INNOVATIVENESS SCENARIO #3:**

You have been hired as the marketing coordinator for a local professional sports team and would like to get an in-depth evaluation of the fans experience. In the past, the previous marketing coordinator was particularly interested in the fan experience of the highest paying customers and spent a considerable amount of his resources on creating a fun and entertaining atmosphere for them, but did little to understand the experience from the perspective of the everyday, casual fan.

You are in the process of developing a plan of action to create a greater atmosphere for all fans and are developing ways to gather the necessary information needed to secure funding and begin planning your promotions for the upcoming year.

*Of the following response options, please select "1" for the option that you would most likely take and "2" for the option that you would least likely take:*

Conduct ballpark sit-ins where you and your employees attend the game as paying customers and assess the experience from the casual fan's seats

Develop an email survey and send it out to all ticket holders

Conduct monthly walk-through sessions at the ballpark where your employees approach customers and ask about their fan experience

Visit the ballparks of other teams bi-monthly and survey their fans about their experience at the ballpark

### **INNOVATIVENESS SCENARIO #4:**

Throughout childhood, you suffered from a debilitating skin condition that became aggravated by the fragrances and oils used in commercial soap and lotion products. After years of suffering with the condition, a few years ago, you started making your own personal soap, lotions and shampoos in an effort to relieve the irritation and your products have significantly reduced your skin irritation.

Recently, you have started to include your soap and lotion products in gift packages for birthdays, weddings and other special events for your friends and family. Everyone you have talked to has provided extremely positive feedback about their experience with your product and recently they have started requesting your products to include in gift sets for their friends.

Although the process of buying the materials needed to create your products will be a significant expense, the positive feedback and weekly request for your products suggests that there may be an opportunity to make a profit selling your products. After some thought, you develop the following potential options.

*Of the following response options, please select "1" for the option that you would most likely take and "2" for the option that you would least likely take:*

Begin by selling your product to friends and family and providing them discounts for referrals

Send product samples and a video discussing your product to executives of an established skin care company and attempt to set up a meeting to discuss opportunities

Identify a few celebrities who promote skin care products and hire them to sponsor your product to include in celebrity gift packs at celebrity award shows and parties

Align with a local store in the neighborhood and negotiate a rate to stock your product

## ***Risk-Taking Scenarios***

### **RISK-TAKING SCENARIO #1:**

You are the owner of a small consulting firm and are in the process of submitting a grant proposal for a large project. You are familiar with the organization that is requesting the work and know that they prefer “state of the art” solutions.

Recently, at an industry conference, a competing consultant discussed a new analytical process that was considered "cutting edge" and "novel" in your industry. You know that the consultant's firm will also be submitting a proposal for the project and that the organization requesting the work will likely give them strong consideration because of the novel analytical solution.

You and your fellow consultants at your firm have a general idea of how the competing firm's solution works, but certainly have not mastered the techniques in full. In addition, you are also aware of numerous limitations to the technique that have not yet been resolved, yet are unlikely to be discussed by the competing firm in their proposal.

*Of the following response options, please select "1" for the option that you would most likely take and "2" for the option that you would least likely take:*

Propose the use of a more common and established analytical solution, while noting the limitations of your competitor's new solution

Recruit the participation of an outside independent consultant familiar with the methodology and include him/her as a secondary researcher

Cite the new analytical solution as **the methodology** that will be used for the project

Cite the new analytical methodology as **one of a few** potential methodologies that you may use in the project

### **RISK-TAKING SCENARIO #2:**

For years you and your colleagues have been working on the design, marketing, licensing, management and development of a computer software role playing game. You know that the market is saturated with many similar games and that the success of your venture is dependent on your ability to get your gaming product to become a staple in homes worldwide. Thus, it will be important to get your product into as many hands as possible if you are to be successful.

You have a number of acquaintances whom own gaming stores who may be willing to offer you shelf space and you also have a faithful email listserv distribution list of approximately 3,500, that you can potentially use to shelf and distribute your game. Yet, you do not have the distribution resources, access to capital or manpower needed to distribute your game to the general public.

*Of the following response options, please select "1" for the option that you would most likely take and "2" for the option that you would least likely take:*

Use your on-hand capital to purchase television, radio, and Internet advertisements

Use your on-hand capital to partner with an established gaming company and utilize their distribution system

Use your on-hand capital to set up a website with a free download of the game and a modest monthly subscription to access all enhanced gaming features and updates

Use your on-hand capital to stock, sell and advertise your product using the distribution systems of your friends and business contacts

### **RISK-TAKING SCENARIO #3:**

You began developing your business plan at a time when the real estate market was very reasonable and buying office space (rather than leasing) was a legitimate option. In light of a current economic depression, you are re-evaluating your options.

On one hand, the cost of real estate is the most affordable that it has been in years. Legal administrative fees associated with the purchase of a new (e.g., building appraisal, inspections, loans and fees) is less expensive and government ownership considerations for purchasing property are very enticing. On the other hand, the short- and long-term viability of a new enterprise in the current economic environment is less stable and getting a loan for any amount at a reasonable interest rate will be difficult.

If you are able to withstand the current economic environment and achieve limited success until the marketplace recovers, buying office space in a desirable location could provide a real competitive advantage for your organization, and result in long-term saving and profit.

*Of the following response options, please select "1" for the option that you would most likely take and "2" for the option that you would least likely take:*

Offer to co-sublet a property with a friend in the desirable location with the long-term goal of eventually renting the whole property

Take out a bank loan to rent the more desirable property with the expectation to refinance when the economy stabilizes

Buy a small plot of land near a more desirable location and rent a small, portable trailer to serve as temporary office space

Rent property in a less expensive location with the long term goal of buying property in a more desirable location later

### **RISK-TAKING SCENARIO #4:**

As an “underground” music artist, you have gathered an intensely faithful and protective international following. In general, your followers laud you for your discussing “unconventional” social and political issues in a

profound and authentic way. In addition, you often hear that your followers love that you have not “sold-out” and allowed your music to be censored and co-opted by the major record companies just to make a profit. As a result, your record sales have stayed consistent over the years, even while most other artists have experienced steep declines in their record sales.

Recently, your business manager was approached by a major corporation that was looking to “modify” one of your most decorated songs to serve as the "official anthem" of a major international sporting event. For your participation, they will provide with you a relatively modest lump-sum payment. On one hand, you know that being the headliner of this event would allow you to introduce your music to a larger international audience and be financially lucrative, but you also understand that you may alienate many of your long time fans who are unlikely to embrace your participating in the event, especially if it requires that you modify one of your most decorated, symbolic and revered songs.

***Of the following response options, please select "1" for the option that you would most likely take and "2" for the option that you would least likely take:***

Headline the event with a percentage of the profits to go to a number of charities specified by you and your supporters

Headline the event under the condition that you can perform both the original and modified versions

Attempt to negotiate a greater percentage of the profits to headline the event since you are likely to lose favor and record sales with your fanbase

Decline to participate in the event

## Appendix C

### Randomized Assignment and Expert Weights (N = 49) for Mild (1), Intermediate (2), High (3) and Extreme (4) EOPI SJT Response Options

ITEM	Continuum Weight	ITEM	Continuum Weight	ITEM	Continuum Weight
PROACTIVENESS 1		INNOVATIVENESS 1		RISK-TAKING 1	
RESPONSE 1	2	RESPONSE 1	1	RESPONSE 1	2
RESPONSE 2	4	RESPONSE 2	4	RESPONSE 2	1
RESPONSE 3	3	RESPONSE 3	2	RESPONSE 3	4
RESPONSE 4	1	RESPONSE 4	3	RESPONSE 4	3
PROACTIVENESS 2		INNOVATIVENESS 2		RISK-TAKING 2	
RESPONSE 1	4	RESPONSE 1	3	RESPONSE 1	3
RESPONSE 2	1	RESPONSE 2	4	RESPONSE 2	2
RESPONSE 3	3	RESPONSE 3	1	RESPONSE 3	4
RESPONSE 4	2	RESPONSE 4	2	RESPONSE 4	1
PROACTIVENESS 3		INNOVATIVENESS 3		RISK-TAKING 3	
RESPONSE 1	4	RESPONSE 1	3	RESPONSE 1	3
RESPONSE 2	1	RESPONSE 2	1	RESPONSE 2	4
RESPONSE 3	2	RESPONSE 3	2	RESPONSE 3	2
RESPONSE 4	3	RESPONSE 4	4	RESPONSE 4	1
PROACTIVENESS 4		INNOVATIVENESS 4		RISK-TAKING 4	
RESPONSE 1	1	RESPONSE 1	1	RESPONSE 1	2
RESPONSE 2	3	RESPONSE 2	3	RESPONSE 2	3
RESPONSE 3	2	RESPONSE 3	4	RESPONSE 3	4
RESPONSE 4	4	RESPONSE 4	2	RESPONSE 4	1

## **Appendix D**

### **Biodata Items**

**1.) Have you ever applied for a patent, license, copyright and/or some other legal entity to protect one of your ideas?**

No

Yes

**2.) Have you develop a formal mission statement for a business idea?**

No

Yes

**3.) Have you developed a name for a potential business venture?**

No

Yes

**4.) Have you ever owned/operated your own business?**

No

Yes



# Appendix E

## Survey Instructions/Informed Consent

### DEAR PARTICIPANT:

Thank you for agreeing to participate in this research. Your participation in this survey will be beneficial in helping us understand the impact of specific organizational and individual practices leading to greater identification of the organizational and individual practices and attitudes that lead to entrepreneurial effectiveness and performance. On average, this survey has taken approximately 30 minutes to complete.

### INFORMED CONSENT:

This survey is open to all participants and your participation is completely voluntary. If at any time you wish to stop participating, you reserve the right to do so without explanation or penalty. Participation in this survey has no bearing on any student's course credit, your individual work status, or any other aspect of your personal livelihood. No personal risk or discomfort is anticipated for this research.

### CONFIDENTIALITY:

This survey is carried out for academic research purposes only. As with any academic research, your answers are strictly confidential and that any information reported to others will not contain any information that can be used to uniquely identify you or your individual responses.

### CONTACT:

If you have any questions, comments, or concerns regarding the content or administration of this research, please contact Michael R. Smith (mrs5628@ksu.edu or 785-532-3326) or Dr. Ron G. Downey (downey@ksu.edu or 785-532-5475).

The Institutional Review Board (IRB) at Kansas State University has approved this research (Application #5638) and you can contact the Chairperson Rick Scheidt (rscheidt@ksu.edu or 785-532-3224) with relevant ethical questions or concerns. Thank you for your participation!

### Opening Instructions:

In the following, you will be intermittenly presented with **12 business-related scenarios** designed to capture your feelings about entrepreneurship in your workplace and job.

**For each scenario, you will be asked to read through the scenario and then select:**

- “1” for the response option that represents the behavior that you would **MOST LIKELY** take to resolve the scenario
- “2” for the response option that represents the behavior that you would **LEAST LIKELY** select to resolve the scenario

**NOTE:** For each scenario, the response options will not always span the entire range of potential solutions that can be used to resolve the scenario. Please select the response option from those listed that you feel is most or least appropriate to resolve the scenario.

In addition, you will also be presented with **8 survey scales** designed to evaluate your attitude about a number of entrepreneurship-related outcomes.

**For each survey scale, please select the response option that best represents your feelings.**

Thank you for your time and participation!

Michael R. Smith, M.S. (ABD)

# Appendix F

## Demographics

**1.) Do you currently work Full-Time or Part-Time?**

Full-Time

Part-Time (specify the number of hours you work per week)

**2.) Are you a manager at your job?**

No

Yes

**3.) How many years have you worked in your current job (please specify)?**

**4.) Gender:**

Male

Female

**5.) Age (Please specify):**

**6.) Ethnicity:**

Caucasian

Native American

2+ Races

African-American

Asian

I prefer not to respond

Hispanic/Latino

Pacific Islander

Other

**7.) Highest Degree Obtained:**

High School Diploma or Equivalent

Some college

Bachelors

Masters

Doctorate, or other professional degree

Other, please explain

# Appendix G

## ENTREPRENEURIAL ORIENTATION

We want to know about your decision making processes. Please read the questions below and each of the possible response options. Select the response that best applies to you.

1 - Strongly Disagree | 2 - Disagree | 3 - Somewhat Disagree  
4 - Neither Agree nor Disagree | 5 - Somewhat Agree | 6 - Agree | 7 - Strongly Agree

1. I search for new processes, techniques, and/or ideas about how to do things	1	2	3	4	5	6	7
2. I prefer a low risk/high security over high risks and high rewards ®	1	2	3	4	5	6	7
3. Wherever I have been, I have been a powerful force for constructive change	1	2	3	4	5	6	7
4. I generate creative ideas	1	2	3	4	5	6	7
5. If I see something I don't like, I fix it	1	2	3	4	5	6	7
6. I promote and champion new ideas to others	1	2	3	4	5	6	7
7. I view risk as a situation to be avoided at all costs ®	1	2	3	4	5	6	7
8. No matter what the odds, if I believe in something I will make it happen	1	2	3	4	5	6	7
9. I investigate and secure funds to implement new ideas	1	2	3	4	5	6	7
10. When it comes to making job-related decisions, I like to "play it safe" ®	1	2	3	4	5	6	7
11. I am always looking for better ways to do things at work	1	2	3	4	5	6	7
12. I develop adequate plans and schedules for the implementation of new ideas	1	2	3	4	5	6	7
13. I like to implement a plan only if I am very certain that it will work ®	1	2	3	4	5	6	7
14. I can spot a good business opportunity long before others can	1	2	3	4	5	6	7
15. I prefer to remain in a job that has problems that I know about rather than take the risks of taking a new job that has unknown problems even if the new job offers greater rewards ®	1	2	3	4	5	6	7

Proactiveness = 3, 5, 8, 11, 14/Innovativeness = 1, 4, 6, 9, 12/Risk-Taking = 2, 7, 10, 13, 15

® = Reverse Scored

Stewart, J. (2009). *An investigation of an intrapreneurial orientation among employees in service organizations*. Unpublished Ph.D. Dissertation. The Ohio State University: Columbus, OH.

# Appendix H

## ENTREPRENEURIAL SELF-EFFICACY

### How confident are you in your ability to...?

1 - Extremely Unconfident | 2 - Unconfident  
3 - Somewhat Unconfident | 4 - Neutral | 5 - Somewhat Confident | 6 - Confident  
7 - Extremely Confident

1. Brainstorm (come up with a new idea for a product or service?)	1	2	3	4	5	6	7
2. Estimate customer demand for a new product or service?	1	2	3	4	5	6	7
3. Get others to identify with and believe in your vision and plans for a new business?	1	2	3	4	5	6	7
4. Identify the need for a new product or service?	1	2	3	4	5	6	7
5. Determine a competitive price for a new product or service?	1	2	3	4	5	6	7
6. Network (i.e., make new contact with and exchange information with others)?	1	2	3	4	5	6	7
7. Design a product or service that will satisfy customer needs and wants?	1	2	3	4	5	6	7
8. Estimate the amount of start-up funds and working capital necessary to start my own business?	1	2	3	4	5	6	7
9. Clearly and concisely explain verbally/in writing my business idea in everyday terms?	1	2	3	4	5	6	7
10. Design an effective marketing/advertising campaign for a new product or service?	1	2	3	4	5	6	7

McGee, J. E., Peterson, M., Mueller, S. L., & Sequeira, J. (2009). Entrepreneurial Self-Efficacy: Refining the measure. *Entrepreneurship: Theory & Practice*, 33, 965-988.

# Appendix I

## TEAMWORK

The following statements are about how you feel and behave at work in relation to others. Please indicate how accurately each statement describes your own feelings and behavior at work.

1 - Strongly Disagree | 2 - Disagree  
3 - Neither Agree nor Disagree | 4 - Agree | 5 - Strongly Agree

1. I don't miss group meetings or team practices.	1	2	3	4	5
2. I enjoy being part of a group.	1	2	3	4	5
3. I support my teammates or fellow group members.	1	2	3	4	5
4. I feel I must respect the decisions made by my group.	1	2	3	4	5
5. I am not good at working with a group.	1	2	3	4	5
6. I prefer to do everything alone. ®	1	2	3	4	5
7. I work best when I am alone. ®	1	2	3	4	5
8. I keep to myself. ®	1	2	3	4	5
9. I don't think it's important to socialize with others. ®	1	2	3	4	5

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® = Reverse Scored

Goldberg, L. R., Johnson, J. A., Eber, H. W., Hogan, R., Ashton, M. C., Cloninger, C. R., Gough, H. G. (2006). The international personality item pool and the future of public-domain personality measures. *Journal of Research in Personality*. 40, 84-96.

# Appendix J

## ENGAGEMENT

The following statements are about how you feel at work. Please indicate how frequently you feel this way at work.

1 - Strongly Disagree | 2 - Disagree  
3 - Neither Agree nor Disagree | 4 - Agree | 5 - Strongly Agree

- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| 1. At work, I feel that I am bursting with energy.          | 1 | 2 | 3 | 4 | 5 |
| 2. At work, I feel strong and vigorous.                     | 1 | 2 | 3 | 4 | 5 |
| 3. I am enthusiastic about my job.                          | 1 | 2 | 3 | 4 | 5 |
| 4. My job inspires me.                                      | 1 | 2 | 3 | 4 | 5 |
| 5. When I get up in the morning, I feel like going to work. | 1 | 2 | 3 | 4 | 5 |
| 6. I feel happy when I am working intensely.                | 1 | 2 | 3 | 4 | 5 |
| 7. I am proud of the work that I do.                        | 1 | 2 | 3 | 4 | 5 |
| 8. I am immersed in my work.                                | 1 | 2 | 3 | 4 | 5 |
| 9. I get carried away when I am working.                    | 1 | 2 | 3 | 4 | 5 |

Schaufeli, W. B., & Bakker, A. B., & Salanova, M. (2006). The measurement of work engagement with a short questionnaire: A cross-national study. *Educational and Psychological Measurement, 66*, 701-716.

## Appendix K

### Final Single Factor Model Loadings of EOPI - Student Sample (N = 188)

#### Most Effective

	Component
	1
Proactive1	
Proactive2	
Proactive4	
Innovative2	.42
Innovative3	.75
Innovative4	
Risk-Taking2	.66
Risk-Taking3	
Risk-Taking4	
Eigenvalue	1.46
% Variance	20.89%

#### Least Effective

	Component
	1
Proactive1	.48
Proactive2	.65
Proactive4	.57
Innovative2	.57
Innovative3	
Innovative4	.50
Risk-Taking2	
Risk-Taking3	
Risk-Taking4	
Eigenvalue	1.80
% Variance	19.97%

## Combined Effectiveness

	Component
	1
Proactive1	
Proactive2	.50
Proactive4	.60
Innovative2	.64
Innovative3	
Innovative4	.54
Risk-Taking2	
Risk-Taking3	
Risk-Taking4	.42
Eigenvalue	1.81
% Variance	20.06%