

FIRM-LEVEL ENTREPRENEURSHIP AND PERFORMANCE:
AN EXAMINATION AND EXTENSION OF RELATIONSHIPS
AND MEASUREMENTS OF THE ENTREPRENEURIAL
ORIENTATION CONSTRUCT

by

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Presented to the Faculty of the Graduate School of
The University of Texas at Arlington in Partial Fulfillment
of the Requirements for the Degree of

DOCTOR OF PHILOSOPHY

THE UNIVERSITY OF TEXAS AT ARLINGTON

May 2007

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ACKNOWLEDGEMENTS

The efforts of many have led to the successful completion of this dissertation and my time at the University of Texas at Arlington. First and foremost, I give God all of the glory of this dissertation for giving me the ability and persistence to accomplish what often seemed to be impossible.

I would like to thank the members of my dissertation committee, Dr. G. Tyge Payne, Dr. Jeffrey McGee, Dr. Abdul Rasheed, Dr. Gary McMahan, and Dr. Courtney LaFountain, for their many hours of time and advising spent helping me get to this point. The words of guidance and feedback were vital to the development and finalization of this dissertation.

I would like to give a special word of thanks to my dissertation co-chair, my colleague, and my friend, Dr. G. Tyge Payne. His countless hours of reviewing, editing, and advising were integral to the completion of this dissertation. He consistently went above and beyond the call of duty for any supervising chair and I will forever be indebted for his efforts.

While many people struggle by themselves through a doctoral program, I can never claim to have accomplished this on my own. The support and love of my family and friends throughout this process helped me keep my sanity, or at least what is left of it. While there are far too many to list each individually, I would like to note just a select few whose role in my life is beyond words. To my father, mother, sister and

brother: You are the family that every person deserves, but a rare few actually get. I could never thank you enough for your support during my years of schooling, which often seemed endless! Tim, Dan, Susan, Kris, Grandmother, Pappy, and on and on with my extended family. Thank you all for your support (and often your housing or storage services!) during these hectic years.

A final word of thanks to my doctoral student colleagues who shared many of the burdens, often lightening the load! Special thanks to Greg, Bob, Tom, Samar Hussam and Marshall.

March 20, 2007

ABSTRACT

FIRM-LEVEL ENTREPRENEURSHIP AND PERFORMANCE:
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Publication No. _____

Justin L. Davis, PhD.

The University of Texas at Arlington, 2007

Supervising Professors: Dr. G. Tyge Payne and Dr. Jeffrey E. McGee

Academic research in various areas of entrepreneurship has gained momentum over the past three decades. A primary topic of interest has been the characteristics of entrepreneurial organizations, often referred to as the entrepreneurial orientation (EO) of the firm. The current study investigates past contributions in this stream of literature, seeking to provide definitive evidence of previously examined relationships. Further, the study analyzes several moderating influences and provides a new model for assessing a firm's EO.

A meta-analytic statistical procedure is applied in the empirical portion of this dissertation. The base models of interest are the relationships between EO, innovativeness, proactiveness and risk-taking and firm performance. These models represent the examination of EO as both a unidimensional and multidimensional concept, consistent with past empirical studies. The influences of environmental munificence, dynamism and hostility are then considered as possible moderators of each of the previously described relationships. A new approach to meta-analytic moderation analyses is presented which utilizes calculated partial correlation values.

A primary contribution is the development of a weighted-unidimensional approach to the measurement of EO. Debate has surrounded the measurement of EO for the past decade. The proposed weighted EO scale satisfies the empirical arguments (or concerns) of some researchers while also considering the important theoretical arguments which have been made in the dimensionality debate. The result is a tool which seeks to unify the two sides of the existing EO dimensionality debate.

Several other moderating influences are also considered, including the type of performance measure utilized, the international/domestic nature of past studies, the type of EO scale used, and they type of sample used in the study. Results provide interesting insights into EO literature. Implications of the current study and avenues for future contributions in this stream of research are discussed.

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CHAPTER I

INTRODUCTION

Emerging from the works of Khandwalla (1977) and Miller (1983), the study of the entrepreneurial nature of organizations has become a central area of research in the entrepreneurship field. Over the past thirty years, researchers have used a variety of terminologies, including strategic posture (e.g., Covin & Slevin, 1989), corporate entrepreneurship (e.g., Barringer & Bluedorn, 1999), and entrepreneurial orientation (e.g., Naman & Slevin, 1993) in measuring and discussing firm-level entrepreneurship. For purposes of clarity, the current study will refer to this concept as entrepreneurial orientation (EO), which has been the most widely utilized in extant literature.

The EO construct is intended to be a measure of the extent to which an organization is entrepreneurial. The existence of an EO in a firm is the result of organizational processes, methods and styles implemented by the firm in the pursuit of acting entrepreneurially (Stevenson & Jarillo, 1990). It is the combined presence of innovation, proactiveness and risk-taking in a firm that leads to the organization having an entrepreneurial orientation (Miller 1983; Covin et al, 2006). It is important to note that these same variables have been common across measurements of concepts such as strategic posture, corporate entrepreneurship and EO, with the Miller/Covin and Slevin scale (hereafter referred to as the MCS scale) being the most commonly utilized

measurement tool. In all of these studies, the core variables are innovation, proactiveness and risk-taking.

The consistent use of an agreed upon measure of EO (i.e., a construct comprised of innovation, proactiveness and risk-taking) has enabled quick progression of the field and an ease of comparisons across studies.¹ However, even with this consistency in measurement, questions surround the EO construct. Is the EO construct beneficial to entrepreneurship research given the lack of a widely accepted definition of “entrepreneurship?” Are we measuring the construct of EO correctly or is it not what we think it is? These general questions strike at the heart of EO as a field of study. The current study will investigate issues central to each of these questions. As the saying goes, “Two steps forward, one step back.” It seems it is time to step back and take a more objective and overall perspective of where thirty years of research on EO has brought us and if the progression of this stream of research is headed in the right direction or should be re-routed.

1.1 Current State of EO Literature

As Covin et al. (2006) discussed, research in the area of entrepreneurial orientation has followed three primary streams, including 1) the factors that predict the presence of high levels of EO in an individual or firm (e.g., Zahra, 1991; Lumpkin &

¹ The remarkable consistency of the measures used by EO researchers has been acknowledged (e.g., Zahra et al. 1999). Measures used were derived from the works of Miller and Friesen (1982) and Miller (1983). Further, a vast majority of studies have utilized survey scales based on scales developed by Miller (1983) and/or Covin and Slevin (1989). The repeated use of these survey instruments have further contributed to an agreed upon measure of EO. The Miller/Covin and Slevin (MCS) scale can be viewed in Appendix A.

Dess, 1996), 2) how EO influences firm performance (e.g., Wiklund, 1999; Zahra & Garvis, 2000), and 3) variables moderating the relationship between EO and firm performance, including strategic processes (e.g., Covin et al., 2006), knowledge-based resources (e.g., Wiklund & Shepherd, 2003), culture (e.g., Kreiser, Marino & Weaver, 2002), dynamism (e.g., Lumpkin & Dess, 2001) and hostility (e.g., Becherer & Maurer, 1997; Zahra & Garvis, 2000). As indicated by the observations of Covin et al. (2006), the EO-performance relationship has become the central area of study in EO research and has served as the foundation for research examining moderators of this relationship. In earlier research, Zahra (1993a: 11) acknowledged the “paucity of empirical documentation of the effect of entrepreneurship on company financial performance.” However, in years since this observation was made, many researchers have empirically examined the EO-performance relationship (e.g., Zahra & Covin, 1995; Becherer & Maurer, 1997; Wiklund & Shepherd, 2005).

While findings examining a direct relationship between EO and firm performance have generally been consistent, two primary issues concerning empirical research in the EO stream have surfaced. First, findings related to the influence of moderating variables on the EO-performance relationship have been mixed. For example, prior research has found both significant positive (e.g., Zahra & Garvis, 2000) and negative (e.g., Becherer & Maurer, 1997) relationships between environmental hostility and EO. While there are many possible explanations for a lack of consistency in findings related to a moderating variable, this does leave cause for concern and

demands scholarly attention providing more conclusive evidence of the impact these variables have on the strength and direction of the EO-performance relationship.

A second empirical issue is the approach used in measuring EO as a unidimensional or multidimensional construct. In treating EO as a unidimensional construct (as proposed by Miller, 1983 and Covin & Slevin, 1989), empirical analyses have failed to consider the unique effects of innovation, proactiveness and risk-taking in relation to firm performance. Additionally, the unidimensional view fails to consider the differing effects of moderating variables on the relationship between individual EO dimensions and firm performance. Issues such as these have spurred theoretical debates on EO-related issues. For instance, empirical issues, such as conflicting unidimensional/multidimensional factor analyses findings, have resulted in a theoretical and empirical debate in the EO literature over the last decade.

1.2. Unidimensionality versus Multidimensionality

Lumpkin and Dess (1996) were the first to discuss the possible theoretical (and empirical) questions related to the unidimensional versus multidimensional approaches to the measurement of EO. They felt the three components of EO (innovation, proactiveness, and risk-taking) had individual, unique relationships with firm performance and could vary independently of one another in their impact. Since this suggestion, many authors have centered their EO-related research on the topic of the unidimensional versus multidimensional nature of the EO construct. In many instances, factor analytic methods have been used to deem the variables as being statistically

unique from or dependent on one another. Several authors have provided empirical support (i.e., factor analyses) for adopting a multidimensional perspective consistent with the proposal of Lumpkin and Dess (1996) (e.g., Stetz et al., 2000; Kreiser et al., 2002). Each of these studies concluded that individual dimensions of EO can vary independently of each other and should be treated as independent, or unique, variables in EO research.

In response to these empirically driven conclusions, Covin et al. (2006) proposed that a theoretical perspective on this debate is also necessary when considering the uni/multidimensional nature of EO. One such argument on theoretical grounds is based on the view that while the individual dimensions *can* vary independently, it is their combined influence which makes an organization entrepreneurial (Miller, 1983; Covin et al, 2006). Thus, while empirical research argues for unique consideration of each variable, a theoretical perspective argues for a unidimensional EO construct.

Following this logic, Covin et al. (2006) suggest the unidimensional versus multidimensional debate should be put to rest by researchers to enable further progression of the EO stream. However, the failure of researchers to adequately examine this major issue, which is central to the EO construct and its utilization in research, would be both irresponsible and counterproductive. The threats of this debate to the EO construct as a whole are obvious. If questions and empirical dilemmas are present, the validity of the construct is called into question. Alternatively, if questions and empirical dilemmas are ignored, the result is the continued progression of a field of

study which could possibly be built on a faulty foundation. Thus, some clarity should still be provided before we blindly dismiss the empirical support for a multidimensional approach in lieu of adopting a more theoretically acceptable and convenient unidimensional perspective.

1.3 Environmental Influence

The current study considers several empirical and theoretical conflicts which have arisen in EO literature. From an empirical approach, many past studies have focused on the EO-performance relationship and moderating variables of this relationship. The vast amount of literature examining the EO-performance relationship, as well as the unique relationships between each of the latent variables of EO and performance, provides an opportunity for taking a broader, and possibly more effective, approach in studying these relationships.

The moderating influence of environmental factors will be assessed at both a collective and individual level. While several studies have investigated the influence of environmental factors on the EO-performance relationship, results have often been mixed leaving researchers uncertain about the existence of environmental influence. For instance, how does the environment impact the EO-performance relationship? Further, do environmental variables have unique moderating impacts on the EO-performance relationship and do these environmental variables also impact the individual variables of innovation, proactiveness and risk-taking differently? Each of these issues will be examined in the current analysis.

1.4 Weighted Measures of EO

Beyond the above issues discussed, several other issues related to EO will be examined in the current study. For instance, there is an innate problem with the EO measure as it has been used in previous studies in that it is composed of three subdimensions that are assumed to be *equal* contributors to an overall EO construct. Numerous studies have demonstrated a positive relationship between EO and firm performance, but did they properly account for the subdimensions across the variety of contexts in which EO has been used? The use of EO, in its established form, has seemed to remove much of the meaning and oversimplified the idea of entrepreneurship and its many facets across multiple environmental contexts. While the assumption that the mutual presence of innovativeness, proactiveness and risk-taking is theoretically required for a firm to be deemed entrepreneurial seems to be valid, the further assumption that each of the factors is equally present or important in all firms restricts the predictive nature of the EO construct.

In this dissertation, I argue that EO, while accounting for the dimensions of innovation, proactiveness and risk-taking, cannot and should not equally weight the influence of each individual dimension on the overall determination of an organization's entrepreneurial orientation. The treatment of all three variables as having an equal contribution to an overall EO construct is questioned and analyzed in the current study. As such, the current study suggests that the EO construct should be treated as a weighted unidimensional construct to most effectively measure the presence of entrepreneurship in a firm. As noted by many authors in recent literature, the latent

variables comprising the EO construct each have unique relationships with firm performance. As such, the contribution of each variable to an overall determination of entrepreneurship is also unlikely to be identical. Thus, the question arises as to the quality, or validity, of EO when used as a unidimensional (or multidimensional) measure. Does the EO construct properly measure, or account for, the three independent measures and their unique contributions to the entrepreneurial nature of a firm? And if it is not a valid measure, how should be measure EO, given the relationships we know, or believe, to exist?

Given this consideration, I utilize empirical analyses to determine and adjust the individual contribution of each latent variable contributing to the overall measure of EO. Weighting the contribution of the individual contributors should result in a more accurate and effective measure of EO. Further, accounting for the environment, I will incrementally examine the EO construct and its three dimensions in relation to the performance of the firm.

While single studies are vital to the development of individual research fields, there are difficulties and faults in making decisive causal conclusions based on an individual study (Hunter & Schmidt, 1990). As such, I seek to utilize past research of the EO construct to examine the relationship between EO and firm performance, as well as the moderating influences of environmental munificence, dynamism (Aldrich, 1979) and hostility. These particular environment variables were selected for study given their prevalence in past EO research and the proposed impact each has on the EO-performance relationship.

Further, the current study will seek to provide more clarity in the debate of uni/multidimensionality by assessing both the collective influence of EO on performance and the individual relationships between each of the three latent variables and firm performance. The final contribution of the present study will be an empirical and theoretical analysis of the usefulness and effectiveness of weighted contributions of each variable latent variable of EO. Such a consideration discards the assumption of equal contribution from each latent variable to the EO construct with the intent of enriching the overall accuracy and validity of the measure while efficiently considering the uniqueness of each variable.

The research questions to be addressed in this study are theoretically and empirically complex, but providing empirical support through an individual study will only add another tally to the growing number of studies and again lead to results which have limited generalizability. The lack of solid conclusions provided by previous research has been acknowledged (e.g., Kreiser, 2004) and demands a new approach to analyzing the lingering questions related to the foundation of EO. To most effectively test the above described relationships and provide new perspectives on the issue at hand, I will utilize meta-analysis methodological techniques. Thus, this study will build on existing literature to most effectively provide conclusive evidence of existing (or non-existent) relationships and moderating influences at a much more definitive level than what has been previously offered.

Meta-analysis is a statistical research amalgamation technique which effectively aggregates the results of many prior empirical studies, resulting in “an estimate of the

true relationship between two variables in the population” (King et al., 2004: 191). This technique is often regarded as providing the most accurate empirical description of a relationship, as well as increasing the generalizability beyond that of a single study (Hunter & Schmidt, 1990). Given this empirical approach, an added benefit will be the ability to investigate various performance measures and any differences based on the measure used to operationalize this dependent variable.

1.5 Importance of Research and Anticipated Contribution

Research in the area of EO has seen rapid growth since it was introduced by Covin and Slevin (1989). Accompanying this growth has been an unusual level of acceptance and replication of the original scales developed in two of the seminal contributions in this stream (i.e., Miller, 1983; Covin and Slevin, 1989). Focal to EO literature has been the relationship between EO and firm performance. More recently, authors have begun to place greater emphasis on variables impacting the strength or direction of the relationship between EO and performance. Concurrently, a debate has emerged surrounding the dimensional nature of the EO construct and the validity of such a measure given the unique contributions of individual variables. These more recent contributions have revealed several important areas of concern for EO researchers.

The goal of the current study is to empirically and theoretically address and resolve three questions which have become central in the EO paradigm. First, the appropriateness of the use of a unidimensional or multidimensional measure of EO is

considered using the findings of past empirical and theoretical literature. By combining the empirical contributions of numerous studies using either a collective or individual approach to the measurement of EO, the meta-analytic methods used will provide clarity on what past research has found. Second, the moderating influence of the individual environmental variables of munificence, dynamism and hostility will be considered in both their effect on EO as a whole and the individual dimensions of the EO construct in relation to firm performance. Finally, particular attention will be given to the contribution of individual components of EO to the overall EO construct. Following this idea, the appropriateness of a measure of EO using weighted contributions of the innovativeness, proactiveness and risk-taking variables will be considered.

In referring to EO, Santos (2004: 26) suggests past literature has made a “plea for contributions of effective empirical work to add credibility to the body of knowledge in this area of study.” The current study takes a unique approach in providing an empirical contribution to EO literature by producing results that confirm or deny findings of past literature and offer a level of generalizability which is unobtainable through the use of single-sample research. In doing this, I seek to strengthen the foundation of entrepreneurial orientation, thus enabling the continued progression of research in this area beyond internal debate.

1.6 Overview of Dissertation

In the second chapter, literature related to the individual and collective components of entrepreneurial orientation will be reviewed. Further, environmental variables of munificence, dynamism and hostility will be defined and discussed in establishing the linkage between EO and firm performance and the potential moderators of this relationship. In chapter three, literature related to strategic choice, strategic determinism, the resource-based view of the firm and contingency theory will be reviewed in developing theoretical arguments for the proposed relationships between variables. Chapter four highlights the methodological and data analyses techniques, providing an explanation and discussion of their application. Results of these analyses are provided and explained in chapter five. In conclusion, chapter six provides a discussion of the implications of the current study and its findings. Further, the contributions of the study will be acknowledged and discussed, followed by a discussion of possible limitations and ideas for future research in this stream of literature.

CHAPTER II

LITERATURE REVIEW

This chapter provides a review of the existing literature in the area of entrepreneurial orientation. An initial introduction to entrepreneurship literature is provided. Building on the work of Lumpkin and Dess (1996), this initial discussion also seeks to clearly differentiate entrepreneurship and entrepreneurial orientation (EO) as separate and unique, yet complimentary, concepts. A detailed examination of EO variables and related literature is then provided as a foundation for the development of testable hypotheses. Moderating variables of the EO-performance relationship are also introduced leading to the formal development and statement of hypotheses in chapter three.

2.1 Entrepreneurship: An Introduction

Organizations and individuals alike have pursued entrepreneurial activities with the intent of capitalizing on available business opportunities in an imperfect competitive market environment. Capitalizing on these opportunities requires the identification of unsatisfied markets, creation of new markets, or the incremental change of an existing market. Notable, however, is the growth of entrepreneurial ventures (both startup and corporate) in recent years. In 2002, it was estimated that 24 million American adults

were engaged in entrepreneurial ventures and an additional ten million Americans (representing 5.6 million new ventures) were engaging in entrepreneurial activities each year (Reynolds et al., 2002).

Entrepreneurship is a fascinating and growing field of study that has received an increasing amount of attention over the last three decades, starting with the seminal work of Peterson and Berger (1972). This growth in entrepreneurial practice has been accompanied by a steady escalation of academic interest and research. In his 1983 study, Miller investigated the foundations of entrepreneurship and provided a platform for future research. From Miller's (1983) perspective, three primary elements contributed to the presence/absence of entrepreneurship within a firm: 1) personality factors of the leader, 2) the structure of the organization, and 3) the strategic decision-making of the firm. Building on these established elements, many researchers have extended knowledge in the field of entrepreneurship.

Evidence of the interest in entrepreneurship in the academic community has come in several forms, including 1) the development of entrepreneurship streams of literature (e.g., entrepreneurial orientation, venture capital), 2) the emergence of academic research journals devoted to the publishing of cutting edge entrepreneurship research (e.g., *Journal of Business Venturing*, *Entrepreneurship: Theory & Practice*), and 3) the introduction of entrepreneurship as a department in business schools (e.g., Babson College, University of Arizona), which is gradually becoming more commonplace.

2.1.1 Entrepreneurship Defined

Theoretical dialogue has advanced our knowledge and understanding of many principles central to the practices and traits of entrepreneurship. Central to these discussions have been a number of theoretical views on the definition(s) of entrepreneurship (Hisrich & Peters, 2002). While a detailed discussion and extension of this definition is beyond the scope of the current study, it is imperative to provide at least a short summary of the status of this discussion in the literature to further differentiate between entrepreneurship and concepts discussed later in this analysis.

The term entrepreneur is of French origin, translated to mean “between-taker” or “go-between” (Hisrich & Peters, 2002). Many different definitions of entrepreneurship have been proposed leading to a lack of agreement among researchers on the entrepreneurship construct (Davidsson, 2002; Gartner, 1990) as well as criticism for the amount of resources allocated to efforts of creating a widely accepted definition (Low, 2001). While a definitional dilemma is present, many researchers feel this is simply an issue which is a function of the youth of the field and will eventually result in a single agreed upon definition. As one author stated, “the definition itself is evolving as the field comes into the mainstream of American business” (Kautz, 1999: 1). Others have cited a lack of paradigmatic development (Ireland et al., 2005) and the lack of a specific theory of entrepreneurship (Phan, 2004) as the true causes for lack of agreement on the definition of entrepreneurship. However, Ireland et al. (2005) emphasize that a lack of paradigmatic development is not a criticism of the field of

entrepreneurship; it just speaks to the youth of this field of study, despite the growing amount of scholarly inquiry.

Past definitions of entrepreneurship have varied in both content and focus, often placing emphasis on individual characteristics, organizational attributes, or the practices of either the individual or organization in business strategy and processes. This disagreement can be attributed to many things, including the way different parties view the role or actions of an entrepreneur (Vesper, 1980). Kaufmann and Dant (1998) provided some clarity when they classified definitions of entrepreneurship into three groups, including definitions based on 1) traits or qualities, 2) roles or functions of the entrepreneur in the economic process, and 3) behaviors and/or activities of entrepreneurs.

Entrepreneurial orientation was originally developed as a firm-level construct and has primarily been applied in that way. However, questions about the level of analysis are beginning to rise in entrepreneurship literature. For example, the vast majority of EO literature focuses on the response of one individual (usually the CEO or other high ranking officer) to represent the entrepreneurial behavior of the entire firm. While these responses are supposed to be indicative of the entrepreneurial behavior of the entire organization, the impact of the individual is also important. For instance, in smaller organizations, the entrepreneurial characteristics of one individual (e.g., CEO) are likely to be highly reflected in the organization's approach to entrepreneurship. From this perspective, entrepreneurial orientation becomes an individual-level

construct, rather than organization-level. This idea is further discussed later in this manuscript.

Pioneering studies in entrepreneurship research emphasized the role of new venture creation as the primary (and often sole) criteria for something to be considered entrepreneurship/entrepreneurial (e.g., Schumpeter, 1934; McClelland, 1961; Vesper, 1980). Even in recent literature, many entrepreneurship scholars acknowledge new entry as the “essential act of entrepreneurship” (Lumpkin & Dess, 1996: 136). Lumpkin and Dess (1996) indicated that new entry refers to “entering new or established markets with new or existing goods or services...by starting a business, through an existing business or internal corporate venturing” (Lumpkin & Dess, 1996: 136). This definition inherently includes the existence of entrepreneurship in large, established organizations (Verheul et al., 2005). Thus, the definition of entrepreneurship has been extended to include entrepreneurial practices within organizations (corporate entrepreneurship) (Pinchot, 1983; Stevenson & Jarillo, 1990; Stopford & Baden-Fuller, 1994), franchising (Shane & Hoy, 1996) and acquisition practices (Gartner, 1990).

The addition of these *types* of entrepreneurship extensively broadens the overarching concept of entrepreneurship. The idea of entrepreneurship at these higher levels, or in larger organizations, has often been explained through such things as innovation within an organization. Further, it is not necessarily firm size which dictates the occurrence of entrepreneurship in an organization (Wennekers & Thurik, 1999); it is the actions taken within the organization by individual employees or through

organizational culture. The importance of entrepreneurship as either a physical practice or as a characteristic of organizational culture and practice has been emphasized in several studies (e.g., Miller & Friesen, 1982; Davis et al., 1991).

Another common foundation for the development of entrepreneurship definitions has been that of opportunity recognition (Venkataraman, 1997; Shane & Venkataraman, 2000; Eckhardt & Shane, 2003). Drucker (1964) initially popularized the idea that entrepreneurs maximize opportunities. Several recent studies have included the role of opportunity recognition as a key element in the definition of entrepreneurship. For instance, Hitt et al. (2001: 480) defined entrepreneurship as “the identification and exploitation of previously unexploited opportunities.” In a similar way, George and Zahra (2002: 5) referred to entrepreneurship as “the act and process by which societies, regions, organizations, or individuals identify and pursue business opportunities to create wealth.” Eckhardt and Shane (2003: 336) defined entrepreneurship as “the discovery, evaluation, and exploitation of future goods and services.” Each of these contributions labels entrepreneurship as a combination of multiple events, primarily that of a perception (opportunity recognition) and an action (new entry, or exploitation of the opportunity recognized).

While each of the above definitions has been developed in recent years, it is an observation made by Lumpkin and Dess (1996) which seems to provide the most clarity. Using the analogy of the difference between the content and process of strategy, they stressed the importance of distinguishing between concepts of entrepreneurship and entrepreneurial orientation (EO). In this way, the authors differentiate between the

processes of entrepreneurship and the content, or event, of entrepreneurship. Using this differentiation as a guideline, a distinction is made in the formal definitions of each concept:

- *Entrepreneurship* (def.) – “the *content* of strategy, which we define as the new entry, that is, the act of undertaking a new venture” (Dess et al., 1999: 94).
- *Entrepreneurial Orientation* (def.) –
 - “The processes, practices, and decision-making activities that lead to new entry” (Lumpkin & Dess, 1996: 136).
 - “...dimensions or attributes that can be characterized as entrepreneurial *processes*...” (Dess et al., 1999: 94-95).

This distinction between entrepreneurship and entrepreneurial orientation is essential to the current study. Following this idea, entrepreneurship is strictly the action of new entry. While there are many other contributing factors that bring an individual or organization to the point of undertaking new entry, these factors are deemed to be antecedents of entrepreneurship, or the processes leading up to new entry. In other words, firms who are entrepreneurial are those who *practice* entrepreneurship; it is an action taken by organizations. Thus, those traits, characteristics, or behaviors of individuals or organizations are what lead them to become, or remain, entrepreneurial.

2.1.2 Degree of Entrepreneurship

An interesting discussion in entrepreneurship literature has focused on defining what makes some organizations more entrepreneurial than others. Cooper and

Dunkelberg (1986) used “degrees of entrepreneurship” to differentiate between the types of behaviors or practices of organizations. Verheul et al. (2005) acknowledged some of the behaviors or activities previously discussed as contributors to the degree of entrepreneurship in an organization. These factors included risk-taking (Cantillon, 1734; McClelland, 1961; Sexton & Bowman, 1985, 1986; Begley & Boyd, 1987; Begley, 1995; Stewart & Roth, 2001), innovation (Schumpeter, 1934; Jennings & Young, 1990; Covin & Miles, 1999), opportunity recognition (Kirzner, 1979; Venkataraman, 1997), desire for success (McClelland, 1961), leader’s locus of control (Miller, 1983; Perry et al., 1986), creativity (Torrance, 1962), and autonomy and competitive aggressiveness (Lumpkin & Dess, 1996), among others.

Building on the ideas of Toulouse (1980) and Kets De Vries (1977), Miller (1983) described entrepreneurial firms as being innovative, taking risks and beating competitors to the punch by proactively capitalizing on available market asymmetries. In contrast, non-entrepreneurial firms failed to innovate within the firm, were highly risk averse, and were imitators of the competition rather than being proactive and pursuing newly available market opportunities.

The entrepreneurial nature of an individual or organization is revealed based on the presence/absence and strength of the above variables. It is these variables which contribute to the degree of entrepreneurial behavior in an organization that serve as the foundation for hypothesis development in the current study. Thus, the important distinction between entrepreneurship and entrepreneurial orientation is stressed in following conceptual development sections.

2.2 Dimensions of Entrepreneurial Orientation

Emerging from Child's (1972) strategic choice perspective, entrepreneurial orientation (EO) has become a very important concept in entrepreneurship literature as research in this area has grown rapidly in the last quarter of a century (Zahra et al., 1999). The gradual development of EO has consistently centered around three primary constructs: 1) Innovativeness, 2) Proactiveness, and 3) Risk-taking. While additional variables have been found to contribute to the overall measurement of EO (e.g., Lumpkin & Dess, 1996), the most widely-accepted measure continues to only include these three elements.

Literature in the EO stream has sought to provide evidence supporting the existence of a relationship between EO and performance. While empirical evidence of this relationship continues to grow (Brown, 1996; Naman & Slevin, 1993; Zahra, 1986; Zahra & Covin, 1995), leading authors in the field have suggested there is a lack of strong evidence for this relationship (Covin & Slevin, 1991; Zahra, 1991) as well as a need for stronger theoretical support (Lee et al., 2001). It has also been noted that one reason for the lack of strong empirical support is the difficulty in measurement of the EO construct (Sexton & Bowman, 1991). As such, several opportunities exist in this stream for sufficient contribution in the development of the EO construct and related variables. A review of the existing literature on both the individual components of EO and EO as a collective measure is provided in the following paragraphs.

2.2.1 Entrepreneurial Orientation

2.2.1.1 Background and Definitions

Entrepreneurial orientation is a multidimensional measure of firm-level entrepreneurship, comprised of innovativeness, proactiveness, and risk-taking. Many early studies contributed to the gradual establishment of entrepreneurial orientation as a theoretically and logically legitimate construct representing the entrepreneurial nature of a firm (Covin et al., 2006). Prior to the formal development of EO, research examining entrepreneurial organizations (e.g., Mintzberg, 1973) identified many characteristics differentiating these organizations from others. Much of this research was summarized by Miller and Friesen (1982) as they provided a comparison of entrepreneurial and conservative firms. In this assessment, several characteristics of entrepreneurial organizations were identified. These included such characteristics as a greater level of differentiation within the firm (c.f., Miller & Friesen, 1978, 1982), higher levels of environmental hostility in a firm's external environment (c.f., Miller & Friesen, 1978, 1982), heterogeneity (Miles & Snow, 1978; Miller & Friesen, 1982), technocratization (Miles & Snow, 1978; Miller & Friesen, 1982), a greater consciousness of organizational strategy (Mintzberg, 1973; Miller & Friesen, 1982), and higher rates of growth (Miller & Friesen, 1982). In contrast, less entrepreneurial firms, or "conservative" firms, were characterized as having lower levels of differentiation, a lower consciousness of organizational strategy, and a more homogenous market focus (Miller & Friesen, 1982). The characteristics provided coincide with Mintzberg's (1973) study and description of entrepreneurial

organizations, Miles and Snow's (1978) "prospectors" from their typology of firms and Miller and Friesen's (1978) descriptions of innovators and entrepreneurs.

The many characteristics listed above have received an extensive amount of attention in the literature. However, it was Miller (1983) who initially proposed a combination of factors which he found to be representative of the entrepreneurial nature, or strategic posture, of organization. Miller (1983: 771) defined an entrepreneurial organization as "one that engages in product market innovation, undertakes somewhat risk ventures, and is first to come up with 'proactive' innovations, beating competitors to the punch." Thus, the foundation of the entrepreneurial orientation construct was introduced, with the key elements being innovativeness, risk-taking and proactiveness. Miller's theory and research instruments have become widely used in the academic community when examining relationship between entrepreneurial, environmental, strategic, and organizational variables.

Researchers have been relatively consistent in their use of EO, but slight discrepancies have emerged in researcher perceptions the EO construct. This can be seen in the different definitions of EO proposed in more recent literature. For instance, EO has been viewed as 1) the strategy-making practices used for new venture creation (Dess et al., 2005), 2) a firm's strategic orientation, including entrepreneurial decision-making and practices (Wiklund & Shepherd, 2005), and 3) the rules and norms used for decision-making (Sapienza et al., 2005).

Given the range of definitions of EO, there still seems to be a strong amount of consistency among the actual measurement of the construct. However, researchers

examining firm-level entrepreneurship have failed to be consistent in the terminology they use to describe the construct (Zahra et al, 1999). Starting with Miller's (1983) study of entrepreneurship, which studied the processes of entrepreneurship, authors have referred to firm-level entrepreneurship as entrepreneurial posture (Covin & Slevin, 1991), strategic posture (Covin & Slevin, 1988; Covin et al., 1990; Merz et al., 1990), strategic orientation (Wiklund & Shepherd, 2005), intrapreneurship (Kuratko, 1993), corporate entrepreneurship (Morris & Paul, 1987; Zahra, 1991, 1993, 1996; Zahra & Covin, 1995), and entrepreneurial orientation (Dess et al., 1997; Covin et al., 1990; Zahra, 1991). Even with the conflicting terminology, measurement of the firm-level entrepreneurship construct has remained surprisingly consistent, with the majority of researchers using Miller and Friesen's (1982) measure, or a slight variation of this measure (Zahra et al., 1999). It seems that more recent literature has adopted the use of "entrepreneurial orientation" as representative of firm-level entrepreneurship. As such, the current study will stay consistent with this growing trend while attempting to provide clarity throughout by clearly distinguishing between any other terminologies used.

2.2.1.2 Conceptual Approaches to EO

Three primary schools of thought have served as the underlying theory of the entrepreneurial orientation construct. Given the diverse nature of entrepreneurship research and its use as a multidisciplinary activity, three disciplines have provided primary contributions in the theoretical development of EO: economics, social psychology, and strategic management (Mitchell et al., 2002). Limitations surround

each individual approach, suggesting a collective approach to theoretical development is optimal.

The economic approach to entrepreneurial orientation has focused on the outcomes of new venture creation (Schumpeter, 1934; Gartner, 1985; Low & MacMillan, 1988). Research taking the economic approach has examined the profitability and/or growth of organizations in evaluating their entrepreneurial nature. The use of economic measures has enabled the analysis of entrepreneurship at multiple levels, including the industry, regional, national, global, and organizational levels. With this approach, researchers have been able to identify various characteristics or variables which contribute to the entrepreneurial behavior or processes of an organization (Delmar et al., 2003; Levesque & Shepherd, 2004).

The second approach to entrepreneurship research has stemmed from personal and social psychology perspectives. Studies utilizing this approach have focused on the individual traits of the entrepreneur, rather than the organization. Venture capital literature has used this approach in examining traits such as risk-taking propensity and/or competitive aggressiveness of the entrepreneur in relation to other variable outcomes (Littunen, 2000; Monaghan, 2000). While this much more micro approach to the study of entrepreneurship has strong promise for future contributions to the literature, many past studies have questioned the validity of current research in this stream (e.g., Gartner, 1985). Causes for concern have been instigated by a lack of consistency in findings, specifically concerning the correlations between personality characteristics and firm performance. Further, a lack of agreement and consistency on

the personality traits of an entrepreneur has created confusion and ambiguity. Even with these problematic issues, this area of study in the entrepreneurship field provides important perspective and great opportunity for future contribution.

The third approach to entrepreneurship has developed from the strategic management field. This perspective considers the role of the entrepreneur in dictating strategic objectives or actions of the organizations and how the entrepreneur affects the organization through these decisions (Mitchell et al., 2002). Further, this perspective examines the influence of entrepreneurial decision-making in the midst of risk on new entry commitments of the organization.

Each of these approaches provides a unique perspective on the entrepreneurial behavior within an organization or individual. Through the collaborative effort of all three approaches, a significant image of entrepreneurial behavior can be captured. As such, behaviors and traits related to a firm's innovativeness, proactiveness and risk-taking are the primary variables contributing to the overall entrepreneurial nature of an organization. It is important to acknowledge both the independent and collective nature of these variables, and how this distinction has been addressed in EO literature.

2.2.1.3 Unidimensionality versus Multidimensionality

While literature in the EO stream has been able to circumvent any major theoretical or methodological controversies, a debate on the dimensional nature of the EO construct has received an increasing amount of attention in the past decade. Beginning with the contribution of Miller (1983), the latent variables of innovativeness, proactiveness and risk-taking were considered to be unique contributors of an overall

measure. Following this view, EO has been treated as a unidimensional construct, comprised of these three variables. Covin and Slevin (1989) developed what is the most widely accepted measure of EO. Building primarily on the works of Khandwalla (1977), Miller and Friesen (1982) and Miller (1983), Covin and Slevin (1989: 79) argued for the aggregation of the dimensions of EO, stating that they “comprise a basic, unidimensional strategic orientation.” Lumpkin and Dess (1996) questioned this unidimensionality and suggested the three variables should be considered unique contributors to the entrepreneurial nature of a firm. Thus, they posited the EO construct to be multidimensional in nature, with each variable having a unique relationship with proposed dependent variables. Several studies have empirically supported this proposal of a multidimensional construct (e.g., Lumpkin & Dess, 1996; Kreiser et al., 2002). These findings were accompanied by a demand for future research to consider the components of EO as unique subdimensions with possible unique effects. Other recent research has suggested the effects of this distinction could change the outcomes of many critical seminal studies in EO literature (Kreiser, 2004).

In the most recent addition to this existing debate, Covin et al. (2006) re-emphasize both the theoretical and definitional grounding of EO as a unidimensional construct. Citing Miller’s (1983) work, Covin et al. (2006) point out the interdependent nature of innovativeness, proactiveness and risk-taking for a firm to be considered entrepreneurial. The absence of any of these characteristics, even with the strong presence of the other two, would theoretically suggest the firm is not entrepreneurial.

2.2.1.4 Past Measures of EO

As previously discussed, entrepreneurial orientation has received an increasing amount of attention in the literature, coinciding with the growth and legitimization of entrepreneurship as a field of study. Several empirical approaches have been taken in measuring the EO construct. For instance, Venkataraman (1989) used a six dimension measure of strategic orientation, including aggressiveness, analysis, defensiveness, futurity, proactiveness and riskiness. Naman and Slevin (1993) used a 7-point Likert type entrepreneurial style scale originally developed by Covin and Slevin (1986, 1988), which was based on the works of Khandwalla (1977) and Miller and Friesen (1982). Kreiser et al. (2002) used a similar scale, but eliminated the risk-taking variable, replacing it with the strategic renewal of the firm. Each of these approaches has seen a minimal level of application in extant literature in comparison to the most widely applied measure.

Initial methodological approaches and measures used by Miller and Friesen (1978), Miller and Friesen (1982) and Miller (1983) all contributed to the future development of a more widely accepted measure of EO. As discussed above, Covin and Slevin (1989) provided this EO measure, which has been replicated repeatedly over the years. To develop their scale, Covin and Slevin (1989) created a survey that examined the innovativeness, proactiveness and risk-taking propensity of organizational leaders. Other operationalizations of each independent dimension of EO will be provided in the following discussions of each variable. Many studies using the EO dimensions have calculated a composite score of EO variables to represent the

entrepreneurial nature of the firm, or an “EO Score.” However, as presented previously, more recent literature has proposed unique effects of each dimension and has treated each variable as a separate predictor.

Two additional dimensions of EO which have been proposed in past literature should at least be acknowledged and addressed. While the vast majority of studies in the EO stream have utilized the MCS scale comprised of only innovativeness, proactiveness and risk-taking propensity, several researchers have suggested the addition of two more contributing variables: competitive aggressiveness and autonomy (e.g., Lumpkin & Dess, 1996). For clarification purposes, these two additional EO variables will be defined and briefly discussed. However, these two variables are not included in the present study given their limited application and the minimal amount of data available for examination of these constructs.

Competitive aggressiveness refers to the way firms react to trends and demand that exist in their market (Lumpkin & Dess, 2001). More specifically, competitive aggressiveness is the degree to which a firm challenges new market entry by firms and outperform rival firms in their particular market segment. As several have suggested (e.g., Lumpkin & Dess, 1996; Covin et al., 2006), competitive aggressiveness is closely related and partially explained by the proactiveness measure of EO. While this has been a major argument against the inclusion of competitive aggressiveness as a component of EO, it also seems competitive aggressiveness is not unique to entrepreneurial firms. By definition, if competitive aggressiveness were included as a part of EO, any firm challenging the entry of other firms into their market would be

considered entrepreneurial. However, the creation of market entry barriers is common across most industries and firms, many which would not be considered entrepreneurial.

The second extra EO variable is autonomy. Autonomy refers to the independent action of individuals or a team in developing an idea and/or vision and supporting its development from idea to completion (Lumpkin & Dess, 1996). Two types of autonomy have been identified in the literature: autocratic mode and generative mode. Autocratic mode is the autonomous action of individuals within the firm. Thus, this type of autonomy is high when the leader is entrepreneurial individually and leads the firm accordingly. In contrast, the generative mode refers to entrepreneurial action by members within the firm as ideas are generated and passed up to management. In this type of firm, the organizational culture of the firm is characterized by entrepreneurial action and this action is carried out by lower level employees. Again, autonomy is closely tied to the innovative and proactive behavior of the firm. While this variable might not be completely appropriate for inclusion in the EO construct, it does provide an interesting perspective for researchers to consider as they analyze organizations. Many researchers have failed to distinguish between the entrepreneurial actions of the organization and the entrepreneurial actions of individuals within the organization. As a result, many organizations have been labeled “entrepreneurial” or “not entrepreneurial” as a result of the actions of a single individual, rather than the actual actions of the firm as a whole. Further ideas of how this distinction can be applied to current research efforts are discussed in chapter six of this dissertation.

While proponents of these two additional measures of competitive aggressiveness and autonomy have provided seemingly credible empirical support for their inclusion, few researchers have included these variables in their studies of EO. While an in depth discussion of possible causes for this is beyond the scope of the current study, it seems the exclusions may be related to both theoretical and logical limitations. For instance, Lumpkin and Dess (1996) noted that competitive aggressiveness and proactiveness loaded on to two separate factors when a factor analysis was conducted. While their arguments for the distinction between the variables is sufficient, arguments supporting the addition of this separate dimension as part of the EO construct fall short of effectively justifying its inclusion. This is demonstrated by the possible issues with the inclusion of each variable that were previously discussed. Further, competitive aggressiveness, while distinct from proactiveness, seems to better illustrate the strategic approach of the organization in response to its environment. In this way, the variable effectively addresses the competitive personality of a firm, but does not seem to be related in any way to the characteristics of an entrepreneurial firm as discussed by Miller and Friesen (1982).

The current study has opted not to include either of these additional measures competitive aggressiveness or autonomy, thus choosing to support the most widely accepted measure of entrepreneurial orientation. Exclusion of these variables as dimensions of the EO construct is intended to reduce conceptual ambiguity. The following sections will highlight the individual dimensions of EO, providing a

background and definition of each and giving examples of prior operationalizations of each construct in previous research.

2.2.2 Innovativeness

2.2.2.1 Background and Definitions

“Innovation is the specific tool of entrepreneurs, the means by which they exploit change as an opportunity for a different business or a different service. It is capable of being presented as a discipline, capable of being learned, capable of being practiced. Entrepreneurs need to search purposefully for the sources of innovation, the changes and their symptoms that indicate opportunities for successful innovation. And they need to know and to apply the principles of successful innovation.”

- Peter F. Drucker, “The Father of Modern Management” (1985)

New development of products and processes was one of the first variables to be considered essential to successful entrepreneurship (Schumpeter, 1934, 1942). In Schumpeter’s (1934) view, societal, technological, and market imperfections could be advanced through increased competition as a result of innovation. Researchers have continued to cite innovation as a key to organizational growth (e.g., Bruderl & Preisendorfer, 2000), with many scholars viewing the characteristic as the single essential component of entrepreneurship (Drucker, 1985).

Innovation has been considered essential in measuring firm-level entrepreneurship since its inclusion in many of the seminal contributions in this stream of research (e.g., Miller & Friesen, 1982, 1983; Miller, 1983). Miller and Friesen (1982) developed two competing models of innovation, depending on the goals and type of organization: the conservative model and the entrepreneurial model. The conservative model describes the innovative practices of organizations using innovation

as a measure of defense, or as a retaliation mechanism. Organizations following this approach normally innovate in the midst of distressful environmental or competitive situations in an attempt to regain their original market position. Environmental uncertainty and competitive pressures often instigate such action. In contrast, the entrepreneurial model is practiced in organizations which consistently and aggressively pursue innovative practices that will give that company an advantage. Many companies have been able to use this type of approach to innovation as a means of competitive advantage over the competition (e.g., 3M and Intel). As Miller and Friesen (1982: 16) discussed, organizations utilizing the entrepreneurial model of innovation viewed it as “a natural state of affairs” with innovative practices being essential to the functioning and future of their firm.

Innovation has been viewed in several ways by researchers in the field of entrepreneurship. For instance, early researchers sought to dichotomize innovation as either product-market or technological (process) innovation. Innovation practices focusing on marketing or advertising functions, product design and/or market research would be typical of product-market innovation (Miller & Friesen, 1978; Scherer, 1980). Technological innovation is characterized by innovative practices focusing on product/market development, with primary focus being placed on industry and technological expertise (Cooper, 1971; Maidique & Patch, 1982). While this distinction is important, future research noted the difficulty of distinguishing between the two types of innovation in academic research (Lumpkin & Dess, 1996).

Early definitions of innovation focused on the extent to which an organization could develop new technologies or practices which were currently not available in a market (Kimberly, 1981). Miller and Friesen (1983) extended this definition by adding the channels through which innovation is achieved. They viewed innovativeness as the efforts an organization put forth towards introducing new products, services, processes, technologies, systems, plans or structures. In more recent literature, scholars have viewed innovation as an organizational response. For instance, Knight (1997: 214) defined innovation as “the pursuit of creative or novel solutions to challenges confronting the firm, including the development or enhancement of products and services, as well as new administrative techniques and technologies for performing organizational functions.” With the presence of the various definitions of innovation, use of a single definition for this study is important to avoid any ambiguity in both hypothesis development and methodological testing. As such, this analysis will use the definition developed by Lumpkin and Dess (1996: 142) which defines innovativeness as “a firm’s propensity to engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, services, or processes.”

2.2.2.2 Past Measures of Innovativeness

Given the extensive amount of literature examining innovation, many different operationalizations of the construct have been used. Measures have differed based on the type of innovativeness being measured, technological or product/market. A high level of either type of innovation represents a strong devotion to innovative practices within the firm (Wiklund & Shepherd, 2005). Lumpkin and Dess (1996) suggest firms

fall along a continuum of innovativeness, ranging from a willingness to try a new product line or other new technology to a zealous pursuit of and commitment to leading an industry in technological and product advancement.

Measurements of innovation within a firm have primarily come in the form of individual response through survey or analysis of existing financial and other organizational data. For example, technological innovation has been examined in several ways. This type of innovation focuses on the pursuit of new processes or production methods, thus indicating a need for different measurement than that which measures product innovation. Survey questions for this construct have centered around a firm's emphasis on technological development, ability to adapt new processes, and desire to have a reputation for trying and producing new processes and/or methods (Zahra & Covin, 1993). In contrast, measures of product/market-specific innovation have put more emphasis on funds allocated to new product development (Miller, 1987, 1988). A commonly used measure for this type of innovation has been a count of the number of new products or services introduced by an organization (Miller & Friesen, 1982; Covin & Slevin, 1989). The measures described above were intended to dichotomize the type of innovation, thus only measuring part of an organization's innovative practices.

Overall measures of innovation have focused on measures of resources devoted to research and development (R&D) within an organization. Miller (1987, 1988) examined R&D expenditures as a percentage of total sales as being indicative of a firm's innovative nature. Lee and colleagues (2001) used two separate measures of

innovativeness, including 1) the number of R&D employees and 2) the number of products/services geared towards market creation and penetration.

The variety of measures used in analyzing innovativeness of an organization provides a strong foundation for future investigation of this variable. Survey methodology has seemingly captured firm intentions and even signs of organizational culture, while measures focusing on expenditures and resource allocation have more objectively observed firm behavior and actions. Each of these approaches is useful in examining the innovative nature of a firm.

2.2.3 Proactiveness

2.2.3.1 Background and Definition

The second unique dimension of entrepreneurial orientation, as operationalized in this study, is proactiveness. In general, proactiveness refers to a firm's intensity in identifying and capitalizing on available market asymmetries. Beginning with the contributions of Penrose (1959), when primary emphasis was placed on the initiative taken by firms in capturing opportunity, research has focused on the response speed of companies to the emergence of available opportunities in their environment. For instance, Miller and Friesen (1982) discussed the importance of introducing new products/technologies ahead of competitors, rather than following other firms or simply responding to competitive threats in the environment. In this respect, proactive organizations seek to seize opportunities ahead of their competitors.

Several studies have acknowledged the importance of capturing first-mover advantage, often labeling this as the key criterion of proactiveness (Miller, 1983;

Lieberman & Montgomery, 1988). These advantages are achieved by firms who are able to quickly and efficiently exploit market asymmetries first in a market, thus resulting in the establishment of brand recognition prior to the entrance of other competitors. However, the central focus on first-mover advantage in determining the proactiveness of a firm was questioned by Miller and Camp (1985) in their investigation of the benefits of being a first mover relative to other organizations who quickly followed into a newly established market. In their analysis, they argued that organizations could still be characterized as novel, fast, and forward thinking without being the first mover (Miller & Camp, 1985). Further, they found that the first and second firms to enter a market were considered to be equally pioneering and had an equal likelihood of success in the new market. Thus, while being the first mover has great advantages, these advantages can still be captured by another organization that quickly follows a leader into an emerging market. However, while being first might not be of utmost importance, quick market entry and/or quick response to the actions of industry competitors are both vital to organizational success in emerging markets.

While being the first mover is still considered proactive, more recent definitions of proactiveness have moved away from making this component the defining variable of the construct. One interesting difference between some of the most commonly accepted definitions of proactiveness is the broad or narrow focus each takes on what activities determine a proactive organization. For instance, Venkatraman (1989) included the modification of internal processes as an element of proactiveness. This

involved such changes as strategic evaluation and adaptation/elimination of operations based on their current stage in the life cycle (Venkatraman, 1989).

More recent contributions to the definition have eliminated the consideration of internal alterations as proactive activities and have placed emphasis on anticipating and pursuing new opportunities in emerging markets and taking initiative in the market place by having a forward-looking perspective in identifying market asymmetries (Lumpkin & Dess, 1996; Lumpkin & Dess, 2001). Stevenson and Jarillo (1990) considered this pursuit of emerging business opportunities to be the fundamental backbone of entrepreneurship. The current study will adopt a definition of proactiveness that follows this most recent line of thought. A primary reason for choosing this approach is the important distinction between proactiveness and competitiveness which is not clearly delineated in many earlier definitions of the construct. Lumpkin and Dess (1996) differentiated between proactiveness and competitive aggressiveness by providing definitions of both variables as follows:

- Proactiveness (def.) – “how a firm related to *market opportunities* in the process of new entry.” (Lumpkin & Dess, 1996: 147)
- Competitive Aggressiveness (def.) – “how firms related to *competitors*, that is how firms respond to trends and demand that already exists in the market place.” (Lumpkin & Dess, 1996: 146)

This distinction proposes proactiveness as a construct which pursues opportunity and new entry, not as a mechanism for change of internal process or the response of firms to existing market issues. As such, the current study will use

Lumpkin and Dess' (1996) definition of proactiveness which formally defines the variable as "taking initiative by anticipating and pursuing new opportunities and by participating in emerging markets" (Lumpkin & Dess, 1996: 146).

2.2.3.2 Past Measures of Proactiveness

Several discussions have surrounded the measurement of the proactiveness variable. One topic of particular interest arises when measuring the construct as a continuous variable. Some scholars examining proactiveness viewed a proactive organization to be aggressive in relation to its competitors, while an organization on the opposite end of the continuum would be labeled "reactive" (e.g., Knight, 1997). However, Lumpkin and Dess (1996) suggest the use of "reactive" is inappropriate as this term suggests firms are responding to their competition. Thus, they suggest measuring proactiveness on a continuum ranging from "proactive" to "passive." As the authors suggest, passiveness is "indifference or an inability to seize opportunities or lead in the marketplace" (Lumpkin & Dess, 1996: 147). Using the concepts of proactiveness and passiveness as anchors of a continuum, reactivity falls somewhere in the middle and represents organizations who are not market leaders, but have the ability to adapt to change and recognize the need for the pursuit of developing markets.

Operationalization of the proactiveness construct has taken several forms over the years, coinciding with important theoretical contributions. For instance, in some earlier studies examining proactiveness as part of the entrepreneurial orientation construct, Naman and Slevin (1993) and Miller (1983) suggest examination of the number of first mover pursuing projects in an organization. This same approach has

also been used in more recent literature. Lee et al. (2001) analyzed the funds allocated for first mover pursuing projects in an organization. Other suggestions for operationalization have focused on measuring the tendency of an organization to be a leader, rather than a follower, in the development of new technologies, products, processes, etc. (Covin & Slevin, 1989; Miller, 1983). This approach removed the possibility of a purely objective measure (such as “first mover projects pursued”), but allows for a more realistic examination of how proactive an organization is, considering it does not require the organization to be the first mover.

An additional note concerning the measurement of proactiveness is the cited existence of possible covariation between innovativeness and proactiveness (Lumpkin & Dess, 1996). Several past studies have failed to find a significant difference between the two constructs when factor analyzing the latent constructs of the variables (Morris & Paul, 1987), thus resulting in a single dimension representing both constructs. However, such findings have been sporadic at best and the dimensions will be considered independent of each other in the current study.

2.2.4 Risk-Taking

2.2.4.1 Background and Definitions

The propensity to accept risk is the third component of the entrepreneurial orientation construct. The influence of risk-taking behavior on the actions of entrepreneurs was first proposed when the idea of entrepreneurship was originally generated. Cantillon (1734) examined risk-taking propensity as the sole principle element that differentiated entrepreneurs from others. The risk at this time came as a

result of the entrepreneur's choice to be self-employed rather than hired by an organization. While the types of risk taken by entrepreneurs has broadened over time, as the term entrepreneurship has come to represent more than only self-employed individuals, the risk-taking behavior of entrepreneurs continued to be a key element in distinguishing them from other individuals or organizations.

Entrepreneurs have been labeled as moderate risk takers compared to the general public (McClelland, 1961; Brockhaus, 1980) and have even been found to categorize various organizational situations as having less risk than non-entrepreneurs, thus magnifying the differences in perception (Palich & Bagby, 1996). While this additional risk could be the combination of psychological or organizational characteristics, the influence of this variable on the behavior of entrepreneurial managers has been well documented (e.g., Miller, 1983; Lumpkin & Dess, 2001).

Proposed definitions of risk-taking have included elements of opportunity capitalization, resource commitments, potential for returns, and uncertainty (Miller & Friesen, 1978; Miller, 1983; Lumpkin & Dess, 1996; Lee et al., 2001). In a definition which has been used repeatedly over the years, Miller and Friesen (1978) capture the notion of risk-taking. In their view, risk-taking is "the degree to which managers are willing to make large and risky resource commitments – i.e., those which have a reasonable chance of costly failures" (Miller & Friesen, 1978: 923). This definition adequately considers the role of resource commitments and uncertainty and will be adopted as the definition of risk-taking for the current study.

The risks taken by entrepreneurial organizations have been classified by Baird and Thomas (1985) as falling into one of three strategic risk categories. The first of these represents the risks assumed when debt is undertaken to fund a project/venture. Borrowing heavily places intense financial pressure on an organization, often resulting in non-financial actions taken by lenders. For instance, a common practice by venture capitalists lending large amounts of resources to an individual or firm is partial managerial control over organizational actions and decisions. In venture capital situations, this control can be exerted by the lending party in many different ways, including possible dilution of the entrepreneur's equity in the venture (Sahlman, 1990), managerial changes made by the lending party (Hoffman & Blakely, 1987), changes in compensation structures (Sahlman, 1990), specified allocation of cash flow and control rights (Kaplan & Stromberg, 2001), and/or staged financing or co-investing (Steier & Greenwood, 1995). While these examples are specific to a venture capitalist and entrepreneur relationship, this situation exemplifies the risks associated with heavy borrowing by entrepreneurial individuals/organizations.

The second type of risk is the excessive commitment of resources into a specific investment. This is a common type of risk taken at both the small-business entrepreneurship and corporate entrepreneurship levels. For small-business entrepreneurship, this excessive commitment of resources can refer to the percentage of resources being allocated to a specific venture or product. For larger organizations, an excessive commitment is often figured as the dollar amount of resources for a particular entrepreneurial project. Either way, risk is enhanced as the level of resource

commitment is increased. The third type of risk proposed by Baird and Thomas (1985) is that of venturing into the unknown. This type of risk refers to the uncertainty, not necessarily financial, associated with entering an industry/market in which little is known. New development of products or technological processes/operations is often associated with this type of risk because no precedent has been established to provide the security of market demand.

2.2.4.2 Past Measures of Risk-Taking

The amount of risk organizations are willing to endure has been researched in many different ways, with varying types of operationalizations of the risk-taking variable (e.g., Kahneman & Tversky, 1979; Brockhaus, 1980; Slovic et al., 1980; Miller, 1983; Thaler & Johnson, 1990; Sitkin & Pablo, 1992; Lee et al., 2001). However, recent research continues to call for a focus on firm-level risk-taking for future study (Santos, 2004). The threats of organizational risk are present in every organization. As Lumpkin and Dess (1996) discuss, no firms operate at a level of zero risk. This leaves organizations to consider what level of risk they want to pursue, or tolerate in many cases. Risk is undertaken through heavy borrowing, excessive resource commitments, and/or entering unknown environments. Thus, the level of risk in a firm can be plotted somewhere along a continuum, ranging from nominal (low) risk to high risk.

Several measures of risk-taking propensity have been used in past entrepreneurship research. A common measure of risk focuses on the risk level of projects undertaken by an organization. For instance, several authors (e.g., Miller,

1983; Lee et al., 2001) have used measures of the number of risky R&D projects pursued and the resources allocated to those risky projects to represent an organization's risk-taking propensity. Venkatraman (1989) took a similar approach, asking managers several questions related to the types of projects they pursued (certain outcomes versus uncertainty). The many different approaches to measuring risk have included the examination of the risk orientation of individuals (MacCrimmon & Wehrung, 1986, 1990), risk analysis by decision makers (Tversky & Kahneman, 1986), past history and performance in risky situation (Slovic et al., 1980; Thaler & Johnson, 1990; Sitkin & Pablo, 1992; Sitkin & Weingart, 1995), risk preferences of organizations or individuals (Kogan & Wallach, 1964), risk propensity (Brockhaus, 1980), and perceptions of risk-related problems (Kahneman & Tversky, 1979). The many areas of risk which have been investigated illustrate the influence of this variable on organizational action and its importance in research.

2.3 Dimensions of the Environment

Following Dess and Beard's (1984) conceptualization, environmental uncertainty is defined here as an umbrella concept that includes munificence, dynamism and complexity. This set of three environmental dimensions was developed by Dess and Beard (1984) following Aldrich's (1979) study that initially established six environmental dimensions. Subsequently, a significant relationship has been found between these environmental dimensions and the performance, structure, and strategy of organizations (e.g., Keats & Hitt, 1985).

The influence of environmental variables on the relationship between EO and firm performance has been examined in several studies in the past two decades (e.g., Covin & Slevin, 1989; Becherer & Maurer, 1997). Recent literature has suggested the continued examination of environmental variables as moderators of the EO-performance relationship (Lumpkin & Dess, 1996; Covin et al., 2006). Three of the primary environmental variables considered in existing EO literature are environmental munificence, dynamism and hostility. These variables will be considered in the current study in the influence on the EO construct in relationship with performance as well as their impact on the relationship between the individual dimensions of innovativeness, proactiveness and risk-taking and firm performance.

2.3.1 Environmental Munificence

Environmental munificence refers to the scarcity or abundance of resources available in an environment and demanded by one or more firms (Castrogiovanni, 1991; Dess & Beard, 1984; Pfeffer & Salancik, 1978; Randolph & Dess, 1984). From the firm level of analysis, the level of munificence is directly related to a firm's ability to acquire resources from the environment and may impact firm performance (Bruno & Tyebjee, 1982). Starbuck (1992) posited munificence as the key factor in determining the ability of the environment to sustain growth. Munificent environments enable a greater amount of organizational flexibility with reduced risk. Cyert and March (1963) suggested that the abundance or scarcity of resources available in a given environment is directly related to an organization's generation of slack resources. This generation of slack resources is particularly important in entrepreneurial firms as it permits the firm to

allocate a larger amount of resources to innovative practices and the development of new strategic processes.

Sharfman and Dean (1991) found Dess and Beard's analysis of munificence was missing one key aspect – competition for resources between organizations. Aldrich (1979) and Mintzberg (1979) each included at least indirect assumptions of this competition, demonstrating the necessity to consider this competition as industry growth and existing competition play significant roles in the dispersion of available resources (Bain & Qualls, 1987). This void has been filled with the use of environmental hostility, which will be discussed further later in this analysis.

The influence of environmental munificence on the operations and performance of entrepreneurial organizations has received a significant amount of attention in EO literature (e.g., Marino et al., 2002; Wiklund & Shepherd, 2003). Resources are considered necessary, but not sufficient for the development of a higher EO in a firm (Lumpkin & Dess, 1996). Thus, the importance of environmental munificence to the performance of entrepreneurial organizations is essential as it enables the pursuit of opportunity.

2.3.2 Environmental Dynamism

Duncan's (1972) original two factors of dynamism were described as "simple-complex" and "static-dynamic." These were later re-analyzed in Beard and Dess' (1984) reframing of environmental factors as they distinguished the two as environmental dynamism and complexity. Dynamism is comprised of numerous variables – for example, speed in which the environment is changing (stability-instability), turnover

rates, and predictability-unpredictability; each aspect contributing to uncertainty. Miller and Friesen (1983: 222) defined dynamism as the “rate of change and innovation in an industry as well as the uncertainty or unpredictability of the actions of competitors and customers.” This definition will be used in the current analysis.

Organizations competing in environments where high levels of dynamism are present must have the flexibility to adapt to a changing environment to ensure organizational survival (Mascarenhas, 1985). A quickly changing environment increases risk and unpredictability, but is a common characteristic of many industries (e.g., computer hardware) (D’Aveni, 1994). A lower level of dynamism in an environment indicates possible slowing of the economy or, under most circumstances, an industry that is well established and non-turbulent. Organizations operating in a more stable environment have the luxury of added stability and predictability of environmental change, as well as greater ability to react and change with the environment. This reduction in uncertainty enables a greater flexibility in strategic pursuit and a lower level of organizational risk.

Entrepreneurship literature has assessed the impact of dynamic environments on entrepreneurial organizations involved in innovative, proactive and risk-taking practices. An extensive amount of literature has focused on the influence of stable or dynamic environments on a firm’s EO (e.g., Wiklund & Shepherd, 2005). Further, studies have examined the influence of the level of dynamism in an environment on innovativeness (e.g., Miller, 1983, 1988), proactiveness (e.g., Zahra, 1991) and risk-taking (e.g., Kreiser et al., 2002). Literature in these areas has stressed the benefits of

dynamic environments to entrepreneurial organizations as it allows them to capitalize on their abilities to innovate and quickly respond to a changing environment, thus providing an advantage over the competition.

2.3.3 Environmental Hostility

The third environmental variable to be examined in this analysis is hostility. In many ways, hostility is the counter-munificence measure as it represents the intensity of competition and scarcity of resources in a firm's environment. It has been commonly used to describe the unfavorable external forces in an organization's environment. Miller and Friesen (1983: 222) defined hostility as "the degree of threat to the firm posed by the multifacetedness, vigour and intensity of the competition and the downswings and upswings of the firm's principal industry." This definition will be used in the current analysis when referring to the environmental hostility facing the firm. As indicated by its definition, hostility poses a threat to the viability of a firm (McGee & Rubach, 1997) and has been examined in relation to firm performance and the competitive behavior of a firm (e.g., Covin & Slevin, 1989; Davis et al., 1991).

A hostile environment is caused by many factors, including industry-specific variables, location-specific variables and other rivalry issues. More specifically, unfavorable market conditions leading to a hostile environment include, but are not limited to, rivalry within an industry (caused by the number of companies competing and the intensity of competition) (Grand, 1995), perceived uncertainties related to product, market and competition (Dess & Beard, 1984), changing demand and radical innovation, and intense regulatory burdens (Werner et al., 1996).

Environmental hostility has been a commonly considered factor in EO literature. Early research examining the relationship between hostility and entrepreneurship tended to argue for a positive relationship between hostile environmental conditions and entrepreneurial behavior (Khandwalla, 1977; Miller, 1983). However, its role as a moderator of the EO-performance relationship has been investigated in numerous studies (e.g., Zahra, 1993; Zahra & Bogner, 2000; Kreiser et al., 2002). This suggests that activities such as innovation within the organization are negatively impacted by the presence of a hostile environment, where competition is high and resources are scarce. While this theoretical argument supports the findings of a negative effect of hostility on the EO-performance relationship, other research has produced inconclusive findings (Covin & Slevin, 1989) and even a curvilinear relationship (Zahra & Garvis, 2000). Kreiser et al. (2002) attributed the inconsistent findings of past research to the use of aggregated measures of EO. The current study seeks to provide definitive evidence of the influence of hostility on the EO-performance relationship, as well as the impact this environmental condition has on the relationship between each of the three dimensions of EO and firm performance.

2.4 Summary of Key Definitions

Several variables discussed so far will serve as key constructs for the hypotheses developed and tested in the current study. The following list is a summary of the definition used for each variable.

1. Entrepreneurship – The *content* of strategy, which is defined as new entry, that is, the act of undertaking a new venture.
2. Entrepreneurial Orientation – The processes, practices and decision-making activities that lead to new entry.
3. Innovativeness – A firm’s propensity to engage in and support new ideas, novelty, experimentation and creative processes that may result in new products, services or processes.
4. Proactiveness – Taking initiative by anticipating and pursuing new opportunities and by participating in emerging markets.
5. Risk-Taking – The degree to which managers are willing to make large and risky resource commitments – i.e., those which have a reasonable chance of costly failures.
6. Munificence – The abundance or scarcity of resources available in an environment.
7. Dynamism – The rate of change and innovation in an industry as well as the uncertainty or unpredictability of the actions of competitors and customers.
8. Hostility – The degree of threat to the firm posed by the multifacetedness, vigor and intensity of the competition and the downswings and upswings of the firm’s principal industry.

Building on the constructs described above and their interrelationships, this analysis will address the influence of each variable in relation to the entrepreneurial nature of the firm and the resulting firm performance. The following chapter will

provide develops the hypotheses to be tested in this study. Four theoretical foundations will be presented which have been the most commonly utilized in extant literature on entrepreneurial orientation and related concepts. A description of methods used in analyzing and testing the hypotheses will then be introduced, as well as the results found from empirical analyses conducted.

CHAPTER III

THEORY AND HYPOTHESIS DEVELOPMENT

This chapter will provide a theoretical foundation for the hypotheses tested in this study. While chapter two provided a discussion of the background, definitions and past measures of each variable in the analysis, chapter three will discuss the contributions of past literature examining the direct relationships between EO dimensions and firm performance as well as the results of past research viewing EO as a unidimensional construct. Further, past literature examining the moderating influence of environmental variables will be reviewed in developing hypotheses examining moderating relationships. Theoretical approaches utilized in EO research are summarized leading to the formal development of hypotheses to be examined in this study.

3.1 Theoretical Foundation

Research on the entrepreneurial orientation of an organization has been built on the underlying concept of strategic choice (Child, 1972). The strategic decisions made within organizations evolve as a result of the implementation of strategic processes and patterns and influence various aspects of the organization, including organization culture, corporate vision and shared value systems (Miller & Friesen, 1978; Pascale,

1985; Hart, 1992; Lumpkin & Dess, 1996). Miles and Snow's (1978) typology of firms was based on these decision-making process variables and the extent to which firms differed in their approach on each of these. This typology is explained below, followed by an extensive discussion of several theories utilized in EO research for the development of hypotheses.

3.1.1 Miles and Snow's Typology

In Miles and Snow's (1978) seminal study, the strategy of a firm was described as having three domains: 1) the entrepreneurial, 2) the administrative, and 3) the technical. The entrepreneurial domain refers to a firm's market orientation. The administrative domain refers to the ability of the organization to effectively coordinate and implement activities, decisions and processes. The technical domain refers to the available technology and processes utilized for the production of goods and services.

Building on the orientation of the organization towards product/market development, they created a typology based on the different business strategies used, categorizing the organizations as Defenders, Prospectors, Analyzers or Reactors. The use of this measure has been validated through its wide application in many settings (Smith et al., 1989), the independence of each categorization (Shortell & Zajac, 1990; Segev, 1998), its ability to consider the role of entrepreneurship, and its clarity and usefulness across industries and organizations of any size (Smith et al., 1989). As the authors describe, Defenders seek stability through cost and product efficiency with a focus on a single type of technology. While possibly innovative in the creation of technology and new processes, Defenders are not viewed as entrepreneurial since they

do not seek to utilize innovative practices to take advantage of opportunities available in the environment. Prospectors focus on new product development and the creation of new technologies in attempt to create or maintain competitive advantage. Thus, Prospectors are innovators who seek industry and market change through the development of products and markets (Miles & Snow, 1978; Segev, 1998). The description of the Prospector type fits closely with other descriptions of entrepreneurial organizations. Analyzers seek to maintain a traditional set of customers and markets, but simultaneously introduce new products and business ideas. However, they are viewed as imitators of industry leaders as they wait for new ideas to be developed and tested before entering a market. In this way, Analyzers are open to change and entrance into new markets after the market has already been established. Reactors are viewed as the least proactive and innovative type of firms. They typically respond to environmental change and competitive pressure rather than take a more proactive stance through the creation of a clear competitive strategy.

Research has described entrepreneurial firms as having strategies focused on innovation and growth through risk-taking (Miles & Snow, 1978; Borch et al., 1999). Covin and Slevin (1989) suggested firms with a high entrepreneurial strategic posture would be most likely to follow growth strategies, which is most closely representative of the Prospector type proposed by Miles and Snow (1978). In a study conducted by Hambrick (1983), Defenders were found to be more profitable and have a greater cash flow than prospectors. However, in dynamic environments Prospectors outperformed

Defenders in market share gains, again suggesting the innovative behavior of Prospectors.

One noteworthy argument pertaining to the typology proposed by Miles and Snow (1978) relates to the expected performance of each type. Analyzers, Prospectors and Defenders are considered to be uniquely efficient and effective in each of their strategic approaches. This suggests that while certain types of organizations are more successful in specific environments, the overall performance of these three types of organizations should be relatively equal given the trade-offs associated with each approach. Doty et al. (1993) studied Miles and Snow's (1978) typology and found support for the proposed equifinal nature of Analyzers, Prospectors and Defenders. While they were unable to show definitive evidence of the impact of industry on their equifinality findings, this issue was later investigated by Jennings et al. (2003). In their study of a large sample of U.S. service firms, Jennings et al. (2003) examined the strategy-performance relationship proposed by Miles and Snow's (1978) typology and found support for both Miles and Snow's typology and configurational equifinality across industries.

Given these findings in support of the equifinal nature of strategic approaches, it is particularly interesting and noteworthy in the current study that research in the area of entrepreneurship has consistently found entrepreneurial organizations to be higher performers across all environments (e.g., Miller, 1983; Covin & Slevin, 1989). Jennings et al. (2003) suggested the further investigation of equifinality in relation to

these groups of firms, with studies paying particular attention to contingency variables impacting performance outcomes.

3.1.2 Contingency Theory

While literature benefits from the many theoretical lenses utilized in the examination of EO, several authors have noted the use of a contingency theory approach as optimal in the study of EO, performance and related moderating variables (e.g., Zahra & Covin, 1995; Lumpkin & Dess, 1996). Contingency theory suggests that there is no optimal structure for an organization, thus viewing the optimal strategy as a function of the different contingency factors in an industry, strategy and environment (Donaldson, 1996). Following this idea, organizations can be highly effective by finding the correct fit between the strategic approach of the organization and the environment in which that organization is operating.

Rosenberg (1968) suggested the introduction of a third variable when analyzing a relationship between two variables, with the intention of producing a more clear and precise picture of the actual relationship between the two variables. Following this idea, Dess and Lumpkin (2001) proposed the use of a multivariate contingency framework in the investigation of the EO-performance relationship. Further, Dess et al. (1999) suggested the combination of strategy, structure and organizational process variables with the dimensions of EO to better understand the performance implications of a firm's EO.

Building on this same idea of more precisely measuring the impact of specific variables on a given relationship, Doty et al. (1993) provide an alternative, and more

effective, approach to the multivariate contingency perspective. They suggest the use of a configurations approach to better understand more complex relationships that require the analysis of multiple variables (e.g., innovativeness, proactiveness and risk-taking) on the performance of a firm. The application of this type of configurational approach has been viewed as an extended model of the original contingency approach and should be utilized when complex interrelationships exist between the variables being studied (Dess et al., 1993). Sandberg (1986) used a similar approach in his examination of new venture performance (NVP). A multivariate contingency approach increases the predictive power of the proposed model and is preferred over bivariate contingency models (Dess et al., 1993). Dess et al. (1997) followed this approach in their study of entrepreneurial strategy and firm performance. Results confirmed that a multivariate configurations approach, where both strategic and environmental variables of entrepreneurial firms were considered in the prediction of performance, provided a stronger prediction of firm performance than a simple bivariate approach. Thus, Lumpkin and Dess (2001: 10) conclude, “Configurations of the dimensions of EO with environmental conditions and organizational factors may provide the strongest indicators of how key variables combine to contribute to or detract from firm performance.”

3.2 Entrepreneurial Orientation and Firm Performance

The relationship between entrepreneurial orientation and firm performance has been at the forefront of entrepreneurship literature for many years. From early studies

such as Sandberg and Hofer's (1987) examination of new venture performance to the breadth of recent literature examining the EO construct, researchers have placed great emphasis on the relationship between entrepreneurship and performance. Scholars have primarily theorized a positive relationship between entrepreneurial orientation and the growth and/or profitability of the firm (Miller & Friesen, 1983; Covin & Slevin, 1991; Lumpkin & Dess, 1996). However, studies have often differed in their approaches to measuring EO, with some examining overall EO in relation to performance and others examining individual dimensions of EO and performance.

In examining EO as a unidimensional construct, many past researchers have found support for a positive relationship between EO and firm performance. For instance, Zahra and Covin (1995) found there to be a significant positive relationship between EO and performance and that this relationship is enhanced over time. Further, they noted the importance of gaining first mover advantages as a result of high EO that ultimately led to higher firm performance. In a separate study which used a contingency theory-based approach, Becherer and Maurer (1997) surveyed 147 U.S. entrepreneurs and confirmed a positive relationship between the entrepreneurial orientations of the entrepreneurs (as representative of the organization) and changes in profitability while also examining the relationship between EO and marketing orientation and the moderating influence of environmental variables.² Wiklund (1999)

² It should be noted that to this point, EO has been treated as a firm-level construct. Several researchers have recently begun examining EO at an individual level, but this application has been questioned by some of the field's leading researchers (e.g., Covin et al., 2006). Advocates of an individual-level EO construct note the prominent use of individuals as representative of the organization in scale-based surveys of organizations when examining EO. This is a very interesting area of possible future research as it could be argued that the actions of entrepreneurs in micro organizations serve as total representation for

took an international longitudinal approach by examining 132 Swedish firms over a two year period. The findings again confirmed a positive relationship between EO and firm performance, while also agreeing with Zahra and Covin (1995) that this relationship is enhanced over time.

While literature in this area has theorized the positive relationship between EO and performance, which was seen in each of these studies, the same has not always been true when examining this relationship empirically. In fact, a handful of research findings have revealed insignificant, and sometimes negative, correlations between EO and performance (e.g., Covin et al., 1994; Brown et al., 2001; Kaya & Seyrek, 2005). However, as empirical results analyzing the relationship between these variables continue to surmount with the wide majority supporting a positive relationship, it has become increasingly evident that an overall perspective of the EO-performance relationship will likely reveal a significant positive relationship between the two variables. Thus,

Hypothesis 1: An entrepreneurial orientation will be positively related to firm performance.

3.3 Innovativeness and Firm Performance

A multidimensional approach to the EO construct requires the individual assessment of the relationship between each unique dimensions of EO (i.e.,

the actions of their organizations. Decision-making responsibilities in these institutions often lie solely on the entrepreneur, thus making firm-level entrepreneurship highly correlated with the individual-level orientation of the entrepreneur.

innovativeness, proactiveness and risk-taking) and the performance of the firm. Following this logic, past literature examining the relationships between each of these dimensions and firm performance are discussed below, leading to hypotheses assessing the unique impact of each individual latent variable on firm performance. Consequently, differential relationships could exist between each subdimension and performance.

The first of the three dimensions to be assessed is the innovation of a firm. As discussed in the previous chapter, innovation refers to a firm's propensity to engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, services or processes. As the root of innovation, creative thinking is essential, but not sufficient, for a firm to be considered innovative (Glynn, 1996).

Since the seminal work of Miller (1983), many scholars have offered suggestions for the measurement of firm-level entrepreneurship, most of which include the innovative nature of an organization as a key component. Jennings and Lumpkin (1989) suggested the use of product innovation as the sole predictor of firm-level entrepreneurship. In their study of the savings and loan industry, they suggested innovative practices to be represented by the number of new products developed or new markets entered by an organization (Jennings & Lumpkin, 1989). As indicated in the discussion of EO, other variables have been added to the measurement of firm-level entrepreneurship, such as risk-taking (e.g., Miller, 1983; Karagozoglu & Brown, 1988) and proactiveness (e.g., Miller, 1983; Covin & Slevin, 1991).

Schumpeter (1934) pointed out that the innovative thinking within a firm can result in two types of innovation: 1) slight improvements to existing products to increase efficiency or profitability, and 2) the development of new products or processes resulting in new market creation. These two types are often referred to as incremental and radical innovation. These innovative practices within a firm better position the company to capitalize on existing opportunities in the environment, as well as create opportunities from within.

The presence of innovation within a firm and the resulting advantages it provides an organization signify its importance. In fact, some researchers have ventured to suggest the level of innovativeness present in a firm to be the single most important predictor of organizational growth (Bruderl & Preisendorfer, 2000) and an essential component of corporate entrepreneurship (Covin & Miles, 1999). Covin and Miles (1999) further suggested that any other dimensions of entrepreneurial orientation (i.e., firm-level entrepreneurship) are antecedents, correlated or consequences of innovation. It should be noted that innovation is viewed by these authors and others as the primary element of the entrepreneurial orientation measurement.

While the idea of innovation as the sole predictor of entrepreneurship within a firm has been generally dismissed, the importance of innovation as a contributing variable to an overall measure of firm-level entrepreneurship is incontrovertible. Supporting this claim of the importance of innovation has been an extensive amount of empirical literature supporting a positive relationship between innovation and firm performance (e.g., Zahra & Bogner, 2000; Kemelgor, 2002; Tan et al., 2005). For

example, using a strategic options perspective, Zahra and Bogner (2000) viewed innovation as a firm-level asset that enables organizations to have a wider selection of strategic choices in pursuit of enhanced performance. Their analysis of 116 U.S.-based software firms confirmed that increased innovation in new ventures leads to higher performance. Given the above arguments, I expect to find a significant relationship between innovativeness and firm performance, consistent with previous research in this area. Thus,

Hypothesis 2: Innovativeness will be positively related to firm performance.

3.4 Proactiveness and Firm Performance

Early studies in entrepreneurship identified the proactive nature of an organization as an important contributor to the entrepreneurial nature of an organization (Mintzberg, 1973; Miller, 1983). While innovation is the act of developing new ideas, the proactiveness of a firm is the ability of the firm to harvest and exploit a future-focused perspective that enables the organization to react to opportunities that are identified for new products, markets or ventures. In essence, the presence of a proactive nature is a key to capitalizing on the innovative capabilities within the firm (Covin & Miles, 1991).

Empirical evidence in the past two decades has reinforced the expected importance of a proactive nature to a firm's performance. Becherer and Maurer (1999) found a significant positive relationship between proactiveness and a firm's change in sales. Building on behavioral and psychological models addressing the influence of an

entrepreneur's individual characteristics on organizational practices, Becherer and Maurer's (1999) study surveyed the presidents of 215 small companies and provided evidence of the importance of proactiveness in an organization. In line with these results, many other studies have also found a strong correlation between the proactiveness of a firm and firm performance (e.g., Lumpkin & Dess, 2001; Krause et al., 2005; Bhuian et al., 2005). Based on these findings, I expect to find a positive association between the two variables. Thus,

Hypothesis 3: Proactiveness will be positively related to firm performance.

3.5 Risk-Taking and Firm Performance

The risk associated with entrepreneurial organizations has been a topic of much research, as was shown in the literature review portion of this study. However, the consideration of how the risk-taking level of an organization directly impacts firm performance is needed when taking a multidimensional approach of entrepreneurial orientation.

As previously defined in this study, risk-taking refers to the extent to which managers are willing to make large resource commitments. As Lumpkin and Dess (1996) suggest, entrepreneurial firms often make large resource investments with the intent of capitalizing on available opportunities in the market, thus resulting in higher returns. Such logic follows the familiar risk-reward perspective. Firms willing to take larger risks by exposing more assets to risk or incurring large sums of debt can benefit from these large risks through abnormal financial gain.

Such consideration for the risk-reward tradeoff reveals an equally important question of whether or not an optimal level of risk exists, or if the relationship between risk and reward is simply linear. It is this question that reveals possible problems in the measurement of EO as a unidimensional construct. As discussed earlier, literature investigating EO has seen a surprising level of consistency in the measurement tools used for analyzing the construct in various studies. The measurement instrument developed and validated by Miller (1983) and later refined and extended by Covin and Slevin (1989) has been treated as the accepted standard measurement of EO (Zahra et al., 1999). While the importance and contribution of the scale developed by these authors is unquestioned, the consideration of the unique contribution of each variable reveals a slight issue in the approach so commonly used.

As Miller (1983: 771) states, “An entrepreneurial firm is one that engages in product-market innovation, undertakes *somewhat risky* ventures, and is first to come up with ‘proactive’ innovations, beating competitors to the punch. A nonentrepreneurial firm is one that innovates very little, is highly risk averse, and imitates the moves of competitors instead of leading the way.” Focusing on the risk portion of Miller’s quote, we can see his original expectations predicted entrepreneurial firms to be those engaging in a moderate level of risk, consistent with the contribution of McClelland (1960), while nonentrepreneurial firms were expected to be much more risk averse. This suggestion implies the entrepreneurial behavior, as measured by the risk-taking variable, to be maximized at a moderate level of risk, implying a curvilinear relationship between the variables. However, while the commonly utilized

measurement developed by Miller (1983) and later reconfigured by Covin and Slevin (1989) provides an adequate measurement for the risk-taking variable, the interpretation of the scale responses, as well as the interpretation of risk-taking to an overall EO construct, fails to adequately represent the original intentions of Miller.

Following the original logic of Miller (1983), a nonlinear relationship between risk-taking and entrepreneurship can be expected. The extent to which this same nonlinearity can be assumed for the risk-taking-performance relationship can be found in past literature examining the direct relationship between these variables. For instance, Brockhaus (1980) found entrepreneurs to be moderate risk-takers, consistent with the future proposals of Miller (1983). Additionally, a later study by Begley and Boyd (1987) supported the findings of a curvilinear relationship between risk-taking and performance, such that firm performance was maximized at moderate levels of risk-taking. These findings suggest that an overall analysis of the individual dimension of risk-taking in relationship to firm performance will reveal a nonlinear relationship. Given the approach used in this study, the hypothesis related to this variable will focus on the significant relationship between the variables. Thus,

Hypothesis 4: Risk-taking will be significantly related to firm performance.

3.6 Equal Contribution of Entrepreneurial Orientation Dimensions to Firm Performance

The debate of EO dimensionality has caused research to examine variables both independently and collectively, as was done in the previous four hypotheses. However, this is only the symptom of a larger issue at the heart of the EO construct and the

resulting measurement of firm-level entrepreneurship. As discussed previously, EO was originally treated as a unidimensional construct in which the latent variables comprising the construct covaried (Covin & Slevin, 1989). In more recent years, numerous scholars have posited the independence of EO dimensions (e.g., Lumpkin & Dess, 1996; Kreiser et al., 2002). These studies have suggested the dimensions can vary independently from one another and should thus be considered as unique contributors.

Embedded in this discussion is the relationship of each variable to the overall construct of EO. The recent findings supporting the uniqueness of the individual dimensions of EO (e.g., Stetz et al., 2000; Kreiser et al., 2002) imply the likelihood of variables having varying impacts on an overall measure of EO. This raises the question of the importance of one variable over the others in determining the level of entrepreneurship in a firm. Taking this perspective, re-examining past literature hints at how the variables differ in their contribution to an overall measure of entrepreneurship. This leads to the question of whether or not innovativeness, proactiveness and risk-taking do, in fact, make equal contributions to firm performance.

Past literature implies, at least through its measurement of EO, the equality of the three dimensions in contributing to an overall construct. As a result of this assumption, another implication is the assumed equal contribution of each unique dimension to firm performance (or any other dependent variable). Clearly, an issue arises in the event these variables are deemed unequal contributors. If the unique contribution of each dimension of EO is not equal across all three variables then failure to acknowledge this in developing an overall dimension of EO results in biased

measurement. Such a problem would imply that past use of EO in predicting performance may not be fully representative of the total contribution of each dimension. If the dimensions do, in fact, have varying relationships with firm performance, then past measurement has under-represented the impact of one or more of the variables and over-represented the impact of one or more variables.

Previous discussion in the literature has alluded to this problem, but a resolution has not yet occurred. For instance, the debate of unidimensionality versus multidimensionality emerged as the result of the expected and observed independent variation among the three dimensions (Lumpkin & Dess, 1996). With this assessment, other scholars followed by empirically testing to determine whether or not the three dimensions *can* vary independently. As discussed in chapter one, several studies using factor analytic procedures concluded that the three variables were unique and that they could vary independently of one another (e.g., Voss et al., 2005).

However, Covin et al. (2006) accurately suggest that these findings do not solve the issue at hand given the theoretical and definitional foundation of the EO construct proposed by Miller (1983). Lumpkin and Dess (1996) and other supporters of a multidimensional perspective of EO suggest the treatment of each variable individually in their contributions. This type of approach would suggest there is no need for an overall EO construct (Covin et al., 2006). This lack of need for an overall construct with the use of individual dimensions is evident given its exclusion in several recent studies of EO (e.g., Tan et al., 2005). However, the exclusion of EO based on the argument of individual variable variation is not valid. For instance, Miller (1983)

acknowledged the possible variation in dimensions, but noted that if these variables did vary he would not consider the organization to be entrepreneurial. Thus, the usefulness of EO as a measurement of entrepreneurship is valid, but requires the presence of all three variables. While this seems to explain the dimensionality debate, it fails to explain the possibility, and likelihood, of different levels of innovativeness, proactiveness and risk-taking in an organization.

The presence of such differences seems common across previous research. If the variables can, and do, vary independently but should be considered as contributors to an overall construct of EO, then it must be acknowledged that the level of presence and contribution of each variable can, or does, in fact differ. Following this idea, I predict an overall perspective of the individual dimensions of EO will confirm the unequal contributions of the variables to firm performance.

For instance, Stevenson and Gumpert (1985) referred to innovation as the “heart of entrepreneurship.” Covin and Miles (1999: 49) suggested “innovation is at the center of the nomological network that encompasses the construct of corporate entrepreneurship.” These ideas suggest innovation as *the* primary contributor to a measurement of entrepreneurship. This falls in line with the suggestions of earlier literature which utilized innovation as the sole, or primary, variable of interest when measuring entrepreneurship (e.g. Jennings & Lumpkin, 1989). Thus,

Hypothesis 5: Innovativeness, proactiveness and risk-taking are *not* equal contributors to firm performance.

Hypothesis 5a: Innovation has the greatest influence on firm performance.

Hypothesis 5b: Proactiveness has a greater contribution to firm performance than risk-taking.

3.7 Moderating Influence of Environmental Munificence

As Covin et al. (2006) discuss, one stream of EO literature has focused on the moderating variables of the EO-performance relationship (e.g., Zahra & Covin, 1995; Lumpkin & Dess, 2001). Among those variables examined as potentially strengthening or weakening the relationship between EO and performance are environmental munificence, dynamism (Aldrich, 1979) and hostility. As literature has shown, an organization's environment and the strategy pursued have been empirically linked with firm performance (Porter, 1980; Scherer, 1980). Scholars have examined each of these environmental variables in EO research, but theoretical and empirical arguments have often shown differences across research.

For instance, the moderating influence of environmental munificence has been examined by several scholars (e.g., Lumpkin & Dess, 1996; Kreiser et al., 2002; Wiklund & Shepherd, 2003). While Lumpkin and Dess (1996) note the importance of slack resources to the development and implementation of new strategic practices (Bourgeois, 1981), they suggest that resources alone will not enhance a firm's EO. In contrast, Zahra (1996) found firms operating in hostile environments were more reluctant to invest in the development of new technologies because the presence of hostility has a negative influence on profit margins while also reducing the availability of resources needed for innovation. As resource scarcity is minimized, firms are

encouraged to increase research and development (R&D) spending (Zahra, 1996), which would likely result in a higher EO of a firm. Thus, firms operating in munificent environments should have the financial flexibility to invest a greater amount of resources in innovative practices.

Miller and Friesen (1982) hinted at the moderating influence of munificence on the proactiveness-performance relationship as they pointed out the greater amount of available strategic resources in growing markets. Thus, firms can build a strategic advantage by capitalizing on the available resources in the environment (Lieberman & Montgomery, 1988). Following this idea, Lumpkin and Dess (2001) argued that environments characterized with resource scarcity would cause organizations to abdicate proactive behaviors with the intent of safeguarding the limited resources available. The authors further elaborate on the influence of this action on an organization's entrepreneurial behavior by suggesting that "such conservative use of resources is antithetical to the important role of experimentation and discovery inherent in proactiveness" (Lumpkin and Dess, 2001: 437). These arguments suggest a positive influence of munificence on the proactiveness-performance relationship.

The influence of environmental munificence on risk-taking of organizations is also apparent as stable environments provide a greater level of certainty, thus allowing firms to take less risk in pursuit of the same strategic objective. Lumpkin (1996) argued for a positive relationship between risk and munificence as the presence of certainty in the environment that is provided by high levels of munificence would lead to easier entry into a market. Thus, the availability of resources in a given market for a firm

pursuing market entry would be very beneficial as the risk associated with entering that market would consequently be reduced.

Building on the above arguments, the following hypotheses suggest a positive influence of munificence on EO and the three underlying dimensions of innovativeness, proactiveness and risk-taking in relation to firm performance. Thus,

Hypothesis 6: The relationship between entrepreneurial orientation and firm performance will be moderated by environmental munificence such that as the level of munificence increases the positive relationship between entrepreneurial orientation and firm performance will be enhanced.

Hypothesis 7: The relationship between innovativeness and firm performance will be moderated by environmental munificence such that as the level of munificence increases the positive relationship between innovativeness and firm performance will be enhanced.

Hypothesis 8: The relationship between proactiveness and firm performance will be moderated by environmental munificence such that as the level of munificence increases the positive relationship between proactiveness and firm performance will be enhanced.

Hypothesis 9: The relationship between risk taking and firm performance will be moderated by environmental munificence such that as the level of munificence increases risk-taking will be more positively associated with firm performance.

3.8 Moderating Influence of Environmental Dynamism

The environmental variable received the most attention as having a moderating influence on the EO-performance relationship is environmental dynamism. Scholars have repeatedly confirmed the importance of the dynamic or stable nature of the environment to a firm's EO (e.g., Wiklund & Shepherd, 2005). The specific affect of dynamism on each of the EO dimensions is of particular concern.

The influence of a dynamic environment on innovative practices within an organization has been well researched. Research in this area has shown firms operating in dynamic environments are more likely to participate in new product innovation activities than firms operating in stable environments (e.g., Miller, 1983; Miller, 1988; Zahra, 1993a). Miller (1988) suggested firms operating in dynamic environments face greater consequences for the inability to implement innovative practices. The result of a failure to respond to dynamic environments with innovation is a loss in market share and sales, thus falling behind the competition (Miller, 1988). Organizations respond to innovative requirements in dynamic settings by pursuing new radical technologies and other pioneering activities (Zahra, 1996; Zahra & Bogner, 2000). Thus, the importance of innovation in dynamic environments is greatly enhanced.

While proactiveness has been noted as an important component of the EO construct, this variable becomes essential in dynamic environments as the ability of an organization to capitalize on market opportunities in a timely fashion becomes both crucial and indispensable. Lumpkin and Dess (2001) noted the importance of a proactive nature in the presence of dynamic environments. In their study of the

organizational life cycle in entrepreneurial firms, proactiveness was found to be crucial to firms in the growth stage as environmental conditions are consistently and rapidly changing and opportunities become more abundant (Lumpkin & Dess, 2001). Zahra argued that proactiveness would enable organizations to better capitalize on these opportunities emerging in dynamic environments, thus leading to a competitive advantage for the firm over competitors. A proactive culture within an organization competing in this type of environment will enable continued competitiveness and the ability to more easily adapt to environmental fluctuations. In support of this argument, Lumpkin and Dess (2001) found a positive relationship between the sales growth and profitability of a firm and the link between proactiveness and dynamism. The theoretical arguments and empirical support discussed above strongly suggest a positive influence of dynamism on the proactiveness-performance relationship.

While highly munificent environments do not necessarily provide the most optimal risk/reward setting for risk-taking (Kreiser et al., 2002), Khandwalla (1977) argued that dynamic environments require a greater level of risk-taking in strategic decision-making and processes to more effectively and successfully respond to the invariable state of change, regardless of the level of munificence in the environment. The certainty provided by munificent environments enables a reduced level of risk-taking by the firm without a total sacrifice of competitive edge. However, dynamic environments prohibit such passive behavior, requiring organizations to increase decision-making speed in responding to environmental change.

A dynamic environment causes both strategic decision and process changes within a firm (Hart & Banbury, 1994). Such settings often result in premature decision-making as managers are forced to act based on incomplete information. While these processes are inevitably fast-tracked, past research has suggested that the failure of firms to adopt risky behavior in dynamic environments will likely result in market share loss, as well as falling behind competitors willing to accept the risk and pursue a more aggressive strategic approach (Miller, 1983; Covin & Slevin, 1991). As a result, dynamism can be expected to have a positive impact on the relationship between risk-taking and firm performance.

From the research discussed above, it is evident that a dynamic environment will positively impact the relationships between each of the EO dimensions and firm performance. Building on the above arguments, the following hypotheses suggest a positive influence of environmental dynamism on EO and the three underlying dimensions of innovativeness, proactiveness and risk-taking in relation to firm performance. Thus,

Hypothesis 10: The relationship between entrepreneurial orientation and firm performance will be moderated by environmental dynamism such that as the level of dynamism increases the positive relationship between entrepreneurial orientation and firm performance will be enhance.

Hypothesis 11: The relationship between innovativeness and firm performance will be moderated by environmental dynamism such that as the level of dynamism

increases the positive relationship between innovativeness and firm performance will be enhanced.

Hypothesis 12: The relationship between proactiveness and firm performance will be moderated by environmental dynamism such that as the level of dynamism increases the positive relationship between proactiveness and firm performance will be enhanced.

Hypothesis 13: The relationship between risk-taking and firm performance will be moderated by environmental dynamism such that as the level of dynamism increases the relationship between risk-taking and firm performance will be enhanced.

3.9 Moderating Influence of Environmental Hostility

The third environmental dimension examined in this analysis is environmental hostility. As discussed previously, hostility refers to the scarcity of resources available in the environment, as well as the intensity of competition for the resources which are available (Covin & Slevin, 1989; Zahra & Covin, 1995). As indicated by Lumpkin and Dess (2001: 436), hostility is often referred to as “the obverse of munificence.” Several authors have examined the influence of hostility on EO, but findings have been mixed across studies. For example, studies have reported both positive (e.g., Zahra & Garvis, 2000; Covin et al., 2006) and negative (e.g., Becherer & Maurer, 1997; George et al., 2001) correlations between hostility and EO.

Early entrepreneurship research examined hostility in relation to the strategy-performance relationship (Covin & Slevin, 1989). For instance, McGee and Rubach

(1997) found that environmental hostility moderated the relationship between competitive strategy and firm performance. These findings are consistent with the suggestions of Ettlie (1983) who proposed a link between environmental hostility and the implementation of strategic moves promoting and fostering both innovative and entrepreneurial practices. However, Milers et al. (1993) found a significant negative correlation between hostility and entrepreneurial practices in their study of 169 furniture manufacturers. Further, while Covin and Slevin's (1989) seminal study found small entrepreneurial firms to perform best in hostile environments, other research found opposite results. For example, Khan and Manopichetwattana's (1989: 597) study of 50 Texas manufacturers found that hostility had a negative impact on innovation, causing the firm to "pull in its horns."

The studies discussed above exemplify the conflicting findings of research examining the impact of environmental hostility on EO. Research has suggested that hostile environments result in greater levels of risk (Khandwalla, 1977) and spawn uncertainty. Further, Miles et al. (1993) viewed hostility as having a negative impact on the organization and leading to adverse conditions. The strategic and managerial problems caused by hostile conditions in a firm's environment suggest a negative impact on firm performance. However, these conditions can also be viewed as an opportunity to capitalize on entrepreneurial behavior and lead to greater performance. It may be that innovative and proactive organizations that are willing to take risk are the most capable of benefiting from hostile environments. Building on the above arguments, the following hypotheses suggest a positive influence of environmental

hostility on EO and the three underlying dimensions of innovativeness, proactiveness and risk-taking in relation to firm performance. Thus,

Hypothesis 14: The relationship between entrepreneurial orientation and firm performance will be moderated by environmental hostility such that as the level of hostility increases the positive relationship between entrepreneurial orientation and firm performance will be enhanced.

Hypothesis 15: The relationship between innovativeness and firm performance will be moderated by environmental hostility such that as the level of hostility increases the positive relationship between innovativeness and firm performance will be enhanced.

Hypothesis 16: The relationship between proactiveness and firm performance will be moderated by environmental hostility such that as the level of hostility increases the positive relationship between proactiveness and firm performance will be enhanced.

Hypothesis 17: The relationship between risk-taking and firm performance will be moderated by environmental hostility such that as the level of hostility increases the relationship between risk-taking and firm performance will be enhanced.

3.10 Summary of Research Hypotheses

Table 1.1 is a summary of the proposed hypotheses which were developed in this chapter (See Figure 1.1).

Table 3.1 Summary of Research Hypotheses

H1	An entrepreneurial orientation will be positively related to firm performance.
H2	Innovativeness will be positively related to firm performance.
H3	Proactiveness will be positively related to firm performance.
H4	Risk-taking will be significantly related to firm performance.
H5	Innovativeness, proactiveness and risk-taking are not equal contributors to firm performance.
H5a	Innovation has the greatest influence on firm performance.
H5b	Proactiveness has a greater contribution to firm performance than risk-taking.
H6	The relationship between entrepreneurial orientation and firm performance will be moderated by environmental munificence such that as the level of munificence increases the positive relationship between entrepreneurial orientation and firm performance will be enhanced.
H7	The relationship between innovativeness and firm performance will be moderated by environmental munificence such that as the level of munificence increases the positive relationship between innovativeness and firm performance will be enhanced.
H8	The relationship between proactiveness and firm performance will be moderated by environmental munificence such that as the level of munificence increases the positive relationship between proactiveness and firm performance will be enhanced.
H9	The relationship between risk taking and firm performance will be moderated by environmental munificence such that as the level of munificence increases risk-taking will be more positively associated with firm performance.

Table 3.1 – continued

H10	The relationship between entrepreneurial orientation and firm performance will be moderated by environmental dynamism such that as the level of dynamism increases the positive relationship between entrepreneurial orientation and firm performance will be enhance.
H11	The relationship between innovativeness and firm performance will be moderated by environmental dynamism such that as the level of dynamism increases the positive relationship between innovativeness and firm performance will be enhanced.
H12	The relationship between proactiveness and firm performance will be moderated by environmental dynamism such that as the level of dynamism increases the positive relationship between proactiveness and firm performance will be enhanced.
H13	The relationship between risk-taking and firm performance will be moderated by environmental dynamism such that as the level of dynamism increases the relationship between risk-taking and firm performance will be enhanced.
H14	The relationship between entrepreneurial orientation and firm performance will be moderated by environmental hostility such that as the level of hostility increases the positive relationship between entrepreneurial orientation and firm performance will be enhanced.
H15	The relationship between innovativeness and firm performance will be moderated by environmental hostility such that as the level of hostility increases the positive relationship between innovativeness and firm performance will be enhanced.
H16	The relationship between proactiveness and firm performance will be moderated by environmental hostility such that as the level of hostility increases the positive relationship between proactiveness and firm performance will be enhanced.
H17	The relationship between risk-taking and firm performance will be moderated by environmental hostility such that as the level of hostility increases the relationship between risk-taking and firm performance will be enhanced.

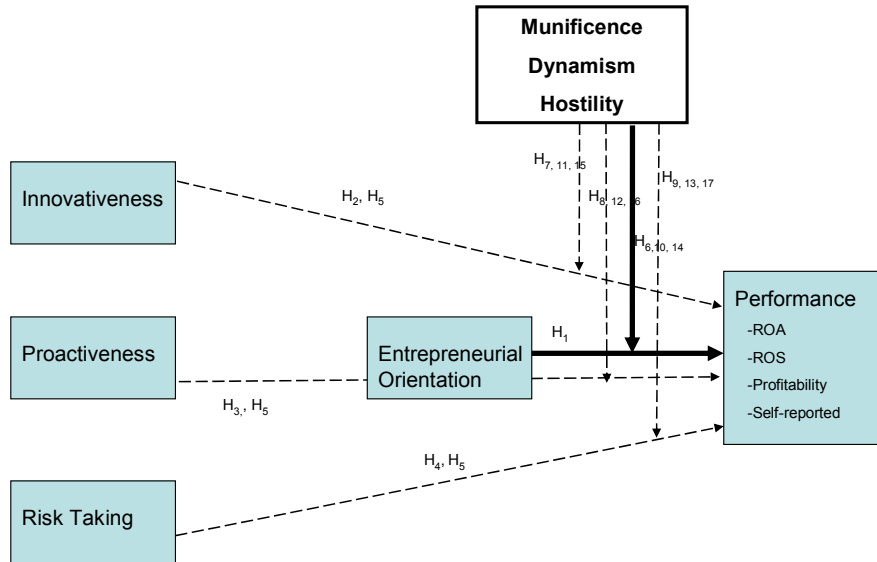


Figure 3.1 Model of Hypotheses

CHAPTER IV

METHOD OF STUDY AND RESULTS

I will use a meta-analytic statistical technique to test the hypotheses presented in the previous chapter. This decision was on the need for conceptual and empirical clarity in this stream of literature. The presence and availability of existing data related to the EO-performance relationship enabled this approach. As discussed by Hedges and Olkin (1982), it is uncommon and very difficult for individual studies to provide definitive and generalizable evidence to make conclusions about a given relationship. This suggestion supports the decision to seek greater clarity and consensus in this stream of literature. The use of meta-analytic procedures enables a scientist to view past research in a more pure, unbiased way, examining relationship without the issue of measurement error. This results in a more definitive analysis, with reduced error, that enables the progression of a given stream of literature with confidence.

This chapter will outline and explain the methods used to test the hypotheses developed in chapter three. The section begins with a brief description of meta-analytic techniques, including the reasons for its application in the current study. A description of the data collection process is then provided, with an emphasis placed on the inclusion criteria of studies utilized in the present analysis. Finally, statistical techniques specific

to meta-analytic studies are outlined to provide clarity for the steps taken in the analyses.

4.1 Meta-Analytic Techniques

“Single experiments or studies in the social and behavioral sciences rarely provide definitive answers to research questions. Rather, if science in the social and behavioral domains is to progress, it must be through the discovery of underlying trends and principles developed from the accumulation and refinement of a large body of studies.”

- Richard G. Niemi -

Meta-analysis is a statistical research amalgamation technique used in many research settings to bring clarity, understanding and generalizability to an area of study. Using previous research contributions as the data populations, rather than individuals or firms, results from many prior studies are aggregated and empirically analyzed, while simultaneously correcting for various artifacts that often bias relationship estimates in individual studies. Given the abundance of studies considered in the analysis, a more reliable estimate of the relationship between two variables is produced (Kin et al., 2004). Thus, the result of the analyses is an estimate of the overall magnitude of the effect (i.e., relationship) being tested (Rothstein et al., 2002). “The effect size statistic produces a statistical standardization of the study findings such that the resulting numerical values are interpretable in a consistent fashion across variables and measures involved” (Lipsey & Wilson, 2004: 4).

In contrast to traditional social and behavioral science studies which utilize a single population of individuals or firms in examining a particular phenomenon,

research using the meta-analysis technique requires the existence of many past studies examining a particular relationship. While essential to the development of our knowledge in the social and behavioral science literature, it is difficult, and unlikely, for a single study to provide definitive evidence of the existence of a particular relationship (Hedges & Olkin, 1982; Wolf, 1986). Thus, the use of meta-analysis enables a more objective approach to testing the presence and direction of relationships.

As Hunter and Schmidt (2004) note, two primary perspectives of the purpose of meta-analysis have surfaced. The first perspective views meta-analytic methods as a tool used to describe and summarize past empirical findings of existing studies in the specified area of research literature (Rubin, 1990). However, Hunter and Schmidt (2004) view the purpose of meta-analysis procedures from a different perspective. Rather than viewing meta-analysis as a tool which simply describes and summarizes past data, this alternative perspective views meta-analytic procedures as an instrument which allows researchers to observe what the results of past studies *would* have been if they had “been conducted without methodological limitations or flaws” (Hunter & Schmidt, 2004: XXV). As a result of the examination of what these studies would have revealed with no bias or methodological limitations, scientists are able to decipher the true underlying construct-level relationship existing between the variables being analyzed. Thus, instead of seeking to summarize and describe past flawed studies, the purpose of meta-analysis is to empirically remove the bias and methodological flaws of these past studies and provide a clearer picture of the actual relationships under study. This is the perspective opted in this study.

With the use of meta-analytic procedures have come numerous accolades and criticisms of its application in a research setting. Hunter and Schmidt (1990) addressed criticisms from James et al. (1986), Kemery et al. (1987), Ladd and Cornwell (1986), Spector and Leving (1987) and Thomas (1988), emphasizing the insignificance of each suggested criticism. These criticisms included: 1) parameter standard deviation equal to zero, 2) bias in r and Fisher's z , 3) erroneous use of confidence intervals, 4) inaccurate estimate of sampling error variance, 5) unreliable estimation of standard deviation, and 6) overestimation of variance due to artifacts. Responses to each of these criticisms can be found in Hunter and Schmidt's (1990: Chapter 5) text. Glass et al. (1981) grouped the criticisms of meta-analysis into four categories. Several authors argued that that use of different measuring techniques, variable definitions, and subjects could not result in logical conclusions based on their comparison. Other scholars have felt the results of meta-analysis were not interpretable given the failure to consider the quality of the studies being considered. Yet another category of criticism consisted of those scholars who argued that published research is biased to report only those analyses showing significant findings, resulting in the bias of meta-analytic studies. Finally, some authors argued that the use of multiple results from the same study leads to bias and again invalidates the meta-analysis (Wolf, 1986). While each of these arguments was of concern at the time, Hunter and Schmidt (2004) point out that all of these have been considered and discarded based on the development of meta-analysis research techniques which solve all of these issues.

Further, the benefits of meta-analytic techniques have been uncontested by avid critics. Specifically, the use of meta-analytic techniques in examining past literature is overwhelmingly preferred over a simple theoretical analysis. As Wolf (1986) observed, traditional literature reviews can result in many problems, such as 1) the selective inclusion of studies, 2) subjective weighting of studies based on individual interpretation, 3) errors in the interpretation of study findings, 4) failure to consider differences across studies in their impact on consistency (or lack thereof) in findings, and 5) little consideration for moderators. Thus, the use of meta-analysis provides a more objective approach to reviewing and extending literature, beyond the biased minds of individuals (Glass et al., 1981).

4.2 Data Collection and Criterion

4.2.1 Literature Search

The current meta-analysis included available entrepreneurial orientation literature from January 1983 until August 2006 which included at least some measure of performance. Following the suggestions of Wolf (1986), the literature search encompassed studies published in academic journals, books (and/or book chapters), unpublished/published dissertations or theses, published conference proceedings manuscripts, technical reports investigating the measure of EO, and any other unpublished books or manuscripts which were identified during the search process. Studies falling in any of these categories were considered in the current data analysis, as long as they met the following inclusion criteria.

In collecting the required data for the meta-analytic procedures, an extensive literature search was conducted. Empirical articles measuring some aspect of entrepreneurial orientation (either a collective measure of the dimension, or one or more of the individual dimensions of EO) were collected. The data collection process began with a general search in available research databases, including EBSCOhost Research Databases, ABI/Inform, and ProQuest Dissertations and Theses, using the key words *entrepreneurial orientation, innovativeness, proactiveness, risk-taking, entrepreneurial posture, strategic posture, corporate entrepreneurship, and firm-level entrepreneurship.*

Following this initial search for articles matching the key words, empirical articles including entrepreneurial orientation (or a synonymous substitute) and performance measures were identified and further examined. While only empirical articles make a data contribution to the current empirical analyses, all articles were examined to further identify studies which were not revealed in the initial database searches. Thus, the electronic search was supplemented with a manual inspection of articles identified and reference lists from past reviews of EO literature (e.g., Lumpkin & Dess, 1996; Zahra et al., 1999; Kreiser et al., 2002).

No prior meta-analyses of firm-level entrepreneurship literature were revealed in the data search procedures. However, it was discovered during the latter stages of this project that several other authors in the entrepreneurship field have recently been working on a similar meta-analysis. These two unpublished studies (Rauch et al., 2007; Unknown Author, 2006) focus solely on the main effects models of EO, innovation, proactiveness, risk-taking and firm performance. Further, one of the studies only

identified 15 articles to be used in the meta-analysis. The current study resulted in a much larger sample size. Additionally, the current study focuses on environmental variables as moderators and considers various relationships between the independent variables and multiple dependent variable measurements, which again was not examined in the other meta-analysis studies. It should also be noted that several miscalculations and misuses of meta-analysis were identified in these other studies, including, but not limited to: 1) application of fixed effects models, where this data requires the use of random-effects models, 2) errors in the calculation of critical ratios, and 3) misinterpretation of credibility intervals (which are vital to moderator recognition).

Following the searches described above, similar searches were performed (using the same key words) in databases of conference papers and proceedings (e.g., Babson-Kaufmann Entrepreneurship Research Conference's Frontiers of Entrepreneurship Research, Academy of Management Proceedings). Further, in an attempt to develop the least biased data set possible, web searches for unpublished papers were performed, as well as personal email contact to leading authors in the field in attempt to identify unpublished (or soon to be published) manuscripts which examined these variables.

Following the data collection procedures outlined above, abstracts of each manuscript were scrutinized to ensure appropriate content (i.e., did the study examine EO, performance and/or a moderating variable) and possible inclusion in the meta-analytic dataset to be constructed. Following the "ancestry" approach for identifying articles (e.g., Cooper, 1998), the reference list of all identified articles was reviewed to

identify any additional studies which had not been exposed in any of the other searches. By working in reverse chronological order in this identification process, reference lists were examined for identifying other works on which each study relied. A common set of base studies were found, with no identified predecessors, thus indicating the beginning of this research stream. It was in these searches of reference lists that most book contributions were identified. Following these final searches, abstracts of all newly identified articles were reviewed and considered for possible inclusion in the meta-analysis based on the criteria mentioned above. Only articles written English were included, given language barriers, interpretation difficulties, and conceptual ambiguity issues.

To this point, the search for articles was intended to be very liberal, thus casting a large net in attempt to catch any and all EO-related studies to be further examined. If the analysis of an article's abstract included any indication of the use of EO, the manuscript was retained for further investigation in subsequent stages. Utilizing the inclusion criteria outlined below, the articles identified were scrutinized in more detail for possible inclusion in the meta-analysis dataset being developed. As expected, these data restrictions and inclusion criteria led to a large reduction in the number of studies retained.

4.2.2 Inclusion Criteria

Several inclusion criteria were assessed to ensure the quality of the data being collected and to most effectively develop the dataset to be analyzed. First, a study had to examine the entrepreneurial orientation of a firm, or at least one of the three

dimensions (i.e., innovativeness, proactiveness, and/or risk-taking). Studies examining these variables in non-business settings were discarded as the terminology of variables could often be misleading and result in unintentional comparisons of dissimilar constructs as a result of conceptual ambiguity. Thus, the studies had to examine EO or related variables within an organizational setting.

Studies to be included had to provide the sample size of their study, as well as the correlation(s) between EO (or individual dimensions) and firm performance or environmental moderating variables. A correlation could be replaced with other information that allowed for the computation of the correlation between the variables being analyzed. These substitute measures included, but were not limited to, the effect size index d-statistic, chi square value (χ^2), F-value or t-statistic. When the Pearson correlation value was not provided, the appropriate conversion technique was used following the formulas provided by Arthur et al. (2001). An extended discussion of these conversion procedures is provided by Lipsey and Wilson (2001) and Rosenthal and DiMatteo (2001). Further, information related to the statistical artifact (i.e., predictor and criterion reliability) was collected from the studies included in the analysis. This information included the type of instrument used for measuring each variable in each particular study and/or any proxy measures used in measuring the variable(s).

4.2.3 Moderating Variables

Many techniques have been proposed and applied in the detection of and testing for moderating variables in meta-analytic studies (e.g., Glass et al., 1981; Hunter et al.,

1982; Hunter & Schmidt, 1990, 2004). For instance, Hunter et al. (1982) proposed that the decision to examine the data for possible moderators should be based on the statistical results of the main effects model. While this approach is more data-driven, it is considered to be the more conservative approach of the two (Guzzo et al., 1987). In the Hunter et al. (1982) procedures, moderating effects are considered as a last resort explanation of the unexplained variance in the model. Variance in the model is initially attributed to statistical artifacts and other “error” associated with nonsubstantive artifacts before assuming the influence of moderating variables as an explanation.

In contrast to this technique, Glass et al. (1981) prefer moderators to be tested as a result of researcher judgment. Testing for moderating variables following this approach is an essential component of the meta-analysis technique and should be treated as a step to be followed after every initial analysis. This approach requires the use of exhaustive data coding procedures in the data collection process as any and all variables available across studies (e.g., type of control group, year of study, journal quality, etc.) should be extracted for consideration as a possible moderator. By collecting as much data as possible, this approach places primary emphasis on explaining statistical variance with moderating influences.

This study followed the approach proposed by Glass et al. (1981), placing an intense focus on data coding procedures and moderator variable collection. Numerous variables were coded during the data collection process to best identify possible moderators, beyond the environmental moderators included in this study’s hypotheses. Some of the most prominent variables which were identified as possible moderators of

the EO-performance relationship included the geographic location of the empirical study (Domestic/International), firm age, firm size, type of industry (high/low tech), and others.

Further, I also examined moderators which were tested in relation to the independent variable (i.e. EO, innovativeness, proactiveness and/or risk-taking) and dependent variable (i.e., firm performance). This approach to moderation analysis was utilized to examine the role of the hypothesized impact of environmental variables (including munificence, dynamism and hostility) on the EO-performance relationship. To my knowledge, this approach to the analysis of moderator variables using meta-analysis has not yet been undertaken. This will be discussed further in following sections.

4.2.4 Data Set

The data collection process consisted of extracting various quantitative and qualitative data from the articles identified as valid for inclusion in the meta-analysis. The variables under study in this meta-analysis need not have been the main focus in any of the studies to be included. It was only required that a simple bivariate correlation between one of the independent variables under examination (i.e., EO, innovativeness, proactiveness and/or risk-taking) and a measure of firm performance be provided in the publication or manuscript (or at least a statistic from which a correlation could be derived). In 1999, Zahra et al. identified 45 studies examining firm-level entrepreneurship in some of the top journals of the entrepreneurship field. However, the number of contributions per year examining this topic has grown almost

exponentially in the last decade. Further, the current analysis is not bound by study quality or journal quality limitations, thus greatly increasing the usable sample size. Given this unbiased data collection procedure, the number of studies examined was greatly increased in comparison to those discussed by Zahra et al. (1999). Thus, I expected to find over 50 usable empirical studies in the analysis of the main effect model (EO-performance), with many of these also being useful for the analysis of moderator variables.

The formal data collection process required the identification and recording/coding of numerous variables from studies examined. Data collected included the correlations between variables under analysis (i.e., correlations between EO, innovativeness, proactiveness, risk-taking, munificence, dynamism, hostility, and firm performance), the journal the study was published in or where the study appeared, the type of EO measure used (including the scale used), the type of performance measured (considered both individually and collectively in the meta-analysis), and any other useful variables which could explain variance in the data set. These other useful variables included items such as year of publication, characteristics of the population sampled, and location of the study. Following the suggestions of Wolf (1986) and Hunter and Schmidt (1990, 2004), as many variables as possible were coded from the articles under examination, thus allowing for the consideration of other moderators not yet revealed in the analysis. These additional moderators were assessed in post-hoc analysis and will be discussed in greater detail later.

Several minor problematic issues arose during the data collection process. Given the nature of meta-analysis, data collection procedures sometimes require decision-making by the researcher. Consistency is the key to avoiding any major issues that emerge as a result of data irregularities or other problems in the data collection process. However, any subjective decision-making should be noted by the author and testing for significant differences should be applied when appropriate (Hunter & Schmidt, 1990).

One of the issues which emerged in the current study was the failure of several authors to provide the specific sample size used in calculating their correlation values (e.g., Barringer & Bluedorn, 1999). Two studies identified and included in the study presented this problem. In both of these instances, a range of N was provided for all correlations calculated in each study. In attempt to take the most conservative approach to addressing this issue, the most conservative sample size was used for data analyses (i.e., the lowest N for any of the correlations). As a result of this decision, the result could be an under-representation of these effect sizes in the data set. However, to ensure this caused no major issues, meta-analyses were run with and without these data points, as suggested by Dalton (2006), and no significant difference in findings were revealed.

Another issue that emerged during the data collection process was the presence of multiple dependent variable measures (i.e., several performance measures used). Many of the articles examined presented this same problem. To address this issue, I chose to embrace the problem and benefit from the additional data. Thus, when

multiple correlations were available in a given study between an independent variable and several different dependent variable measurements, all of the correlations were recorded. Further, as can be seen in the results section of this dissertation, these various performance measures enabled the testing of not only how EO relates to firm performance, but how it relates to various kinds of organizational performance. It should be noted that while some studies provided multiple data points as a result of multiple dependent variable measurements, using more than one of these data points in running the overall main effects model would have greatly biased the results.³ A more extensive discussion of the various performance indicators identified and their relationships to the various IVs (i.e., EO, innovativeness, proactiveness and risk-taking) is provided in the “Discussion” section of this manuscript.

4.3 Data Analysis

4.3.1 Finalized Sample

Following the data collection procedures outlined above, a finalized sample of studies examining entrepreneurial orientation, innovativeness, proactiveness and/or risk-taking was identified. After the search procedures described above, 162 articles

³ The presence of multiple dependent variable measurements enabled a greater number of correlations to be identified and utilized in the empirical examination of hypotheses. However, only one correlation could be used for each study when conducting overall main effects calculations. To most appropriately address this issue, all correlations for a single study were averaged and this number was used as the representative correlation for that particular study. For instance, Zahra (1991) used four performance measures and correlations between EO and these performance variables were provided. Correlation values between EO and EPS, ROI, Net Income and ROA were .16, .26, .22 and .19, respectively. For the overall meta-analysis of EO with performance, the data point entered for this study was the average of these four performance correlation values (i.e., .2075). However, when the differences were examined

examining EO, or one of its sub-dimensions⁴, were revealed. From this database of articles, inclusion in the methodological portion of this study was limited to those EO studies that were empirical and provided enough information to allow their use. Thus, the total search process yielded 76 empirical studies which provided usable information for data examination. From these studies, 203 germane bivariate correlations were revealed. The studies' total combined sample size totaled 70,325.⁵ This sample size is derived by adding the number of companies on which each of the 76 studies was based. Research in the field of interest has often been characterized by the use of multiple IV and DV measures, resulting in the large sample-to-study ratio which is evident in this analysis.

It should be noted that this sample size is not the sample size used in data analyses and also does not represent the sample of studies examining moderating variables. Sample sizes used in empirical analyses were based solely on the number of studies particular to that IV-DV measurement. For example this sample size represents

based on type of dependent variable, the increase in data enabled much more effective and accurate measurements.

⁴ In identifying articles examining the subdimensions of EO (i.e., innovativeness, proactiveness and/or risk taking), inclusion was limited to those studies examining these variables in an entrepreneurial setting or utilizing entrepreneurship scales for measurement. For example, while there are hundreds of studies that examine innovation in one form or another, only 27 were identified that examined innovation in an entrepreneurial setting (or with the synonymous use of EO, corporate entrepreneurship, etc.). This exclusion of other studies was deemed necessary to optimally capture the effect size of the salient dimensions of EO on firm performance.

⁵ The total sample size of 70,325 is not meant to be misleading, but should be further explained. Naturally, as a result of the empirical approach utilized, this number is artificially inflated. For example, many of the studies examined a single independent variable (e.g., EO) in relation to multiple dependent variables (i.e., multiple performance measures). As a result, the study sample size is calculated twice into the additive sample size represented in a meta-analytic study. So, if $n = 500$ in a particular study, but two dependent variables are examined in relation to the IV, the n used for omnibus testing in these meta-analytic procedures would be 1000. Following the work of Dalton et al. (2003), this omnibus test is utilized for identifying the possible existence of moderator influences on the examined relationship.

all studies examining EO, innovativeness, proactiveness, and/or risk-taking, including studies that examined one or all of these variables. However, when running actual meta-analytic analyses, only the sample size of those studies particular to the relationship being analyzed was considered.

The use of the meta-analytic procedure results in extreme variation in the number of studies utilized for the testing of each hypothesis. The number of studies used in the analyses of various hypotheses ranged from 56 to three. To be included in the analysis, a given variable was required to be represented in a minimum of three studies, following the work of Dalton et al. (2003). Petitti (2000) suggested that any information from a study sample should be included only once in any analysis. Abiding by this rule had two primary consequences. First, many studies provided multiple measures of a given variable. For example, Zahra and Garvis (2000) had multiple measure of performance, resulting in five separate correlation values between EO and those five performance measures. However, to avoid the over-representation of a single study, these five performance measure correlations were averaged to result in a single correlation. This single correlation was deemed to be representative of this particular study. This same procedure was followed for any study providing multiple IV or DV measures. While this greatly reduces the number of correlation values included in each analysis, failure to follow this procedure would result in biased and misleading results from the analysis.

A second consequence of Petitti's (2000) suggestion was an inability to test all of the proposed relationships. If three separate studies examining a particular

relationship were not identified, that particular relationship was not testable using meta-analytic procedures. One example of this was the relationship between innovativeness and ROA. Three correlation values were revealed for this particular relationship. However, two of those values came from the same study (i.e., Zahra et al., 2000). Thus, only two separate populations were represented by these three correlation values and calculations were not possible.

4.3.2 Data Conversions

As previously mentioned, the meta-analytic procedure can be carried out using numerous measures of variable relationships, including correlations (r), the effect size index d -statistic, chi square value (χ^2), F-value or t-statistic. However, to test the models, all relationship measures had to be converted to a common measure. This study selected the correlation (r) as the destination statistic. Conversion procedures were carried out on all reported F-values and t-statistics, as these were the only other reported statistics in the data gathered. Conversion procedures for each of these were conducted as follows:

Convert t-statistics to correlation value (r):

$$r = \text{sqrt} [t^2 / (t^2 + \text{df})]$$

*This conversion can be used with either paired or unpaired t tests.

Convert F-value to correlation value (r):

$$r = \text{sqrt} [F / (F + \text{df}(e))]$$

*This conversion can only be used with one-way ANOVAS

(This was the only conversion formulation needed for F-values in this study)

These conversion methods are described in further detail by Lipsey and Wilson (2001) and Rosenthal and DiMatteo (2001).

4.3.3 Main Effects Analyses

In testing the main effects models, I followed the procedures of meta-analysis outlined by Hunter and Schmidt (1990). Sample size weighted correlations were calculated for the EO-performance, innovativeness-performance, proactiveness-performance, and risk-taking-performance relationships. As indicated above, when multiple performance measures were present in a single study, the average effect was computed. Meta-analysis aggregates the reported results of a relationship across studies, producing a computed estimate of the true score relationship between variables under study, weighting them by the sample sizes of each individual study. This results in the calculation of the mean weighted correlation across all studies of interest.

Several procedures followed this initial calculation of the sample's overall correlation, consistent with past meta-analytic studies (e.g., Dalton et al., 2003). First, to check the variability of the calculated correlation values, the standard deviation of the correlations was calculated. Total variability of the studies is measured using several calculations: 1) True score population variance, 2) True score variation due to sampling error, and 3) True score variation due to sample artifacts (including reliability and range restrictions). By observing these values, a more precise estimation of the actual true variability can be determined.

This study used Schmidt and Le's (2004) software, entitled "Hunter and Schmidt Meta-Analysis Programs" to control for these variables. Hunter and Schmidt's

(1990, 2004) artifact distribution formulas were used in this statistical package. The purpose of the current study was to estimate the correlation between variables of interest, but information related to the statistical and measurement artifacts was not available in most studies, given this is not commonly provided information in management literature. Hunter and Schmidt (2004) suggest a meta-analysis of correlations using artifact distributions under these circumstances. Further, given certain indirect range restrictions, a procedure was used which corrects for indirect range restrictions.⁶

An important area of note, particular to this study, is the treatment of the presumed error associated with sample studies. As Dalton et al. (2004) point out, many meta-analysis studies in strategic management literature have assumed that the observed variables they were analyzing were error free (e.g., Boyd, 1991; Rhoades et al., 2000). This assumption is indicated through their application of a presumed reliability measure of 1.0. In contrast to this commonly accepted practice, a more conservative approach has been introduced and applied in numerous meta-analytic studies (e.g., Dalton et al., 2003; Dalton et al., 1999) and was used when running the current analyses. This procedure opts to calculate all values with a presumed reliability measure of .8. While

⁶ According to Hunter and Schmidt (2004: 519), indirect range restriction is present when “selection occurs on a third variable that is correlated with both the variables of interest.” For example, if a study was conducted measuring the validity of a managerial competence test in a business school and all of the business students were initially admitted to the business school based on their high GMAT scores, an indirect range restriction would be present on the managerial competence test. In the same way, a vast majority of studies examined in the current meta-analysis focused on firms that were expected to possess “entrepreneurial” characteristics based on their size, industry, history, etc. If the selection of companies used in each of these samples was based solely on the presence of entrepreneurial behavior (and if data related to the restricted and unrestricted standard deviations on that level of entrepreneurship was available), then existing formulas could be applied to correct for this form of indirect range restriction.

this results in the possible slight underestimation of the actual relationships being tested, it provides more conservative results that will not overestimate or misrepresent any relationships. Further, this approach helps reduce concern related to the suspected existence and statistical impact of sub-samples in the analysis (Dalton et al., 2004). Data validity or reliability measures were not provided in any of the studies being examined. All values were calculated at the .6, .7, and .9 reliability levels, with no findings showing significant differences between any of these reliability levels and the chosen .8 reliability level.

Analysis of main effects models examined the following relationships: 1) EO-overall firm performance, 2) Innovativeness-overall firm performance, 3) Proactiveness-overall firm performance, and 4) Risk-taking-overall firm performance. Results of these meta-analyses are provided in the following “Results” chapter of the manuscript.

4.3.4 Moderation Analyses

Normal testing of moderation, using basic regression analysis, involves the development of a multiplicative in an effort to identify whether the variance explained is significantly higher than that achieved by individual variables alone. In meta-analysis, the testing of moderation influences is achieved through sub-group comparisons. Traditionally, a separate meta-analysis is run on each particular sub-group, resulting in a population r for each of these sub-groups. These calculate population correlations are then statistically examined using a critical ratio to determine

While this data is rarely available (and was not available in any of the studies examined here), the

if the two correlations (i.e., the correlation with and without the moderator variable) are significantly different.

Moderation analyses in this study proved unique when compared to past meta-analytic studies. Past meta-analysis studies have been limited to the use of moderators which are descriptive characteristics within studies (e.g., study location, sample characteristics, etc.). While several of these types of moderators were used (and are elaborated on below), the testing of environmental variables as moderators of the relationship between EO, innovativeness, proactiveness, risk-taking and firm performance required an innovative application of the meta-analysis procedure. This difference can best be explained with an example.

In their 2004 article, King et al. applied meta-analysis in examining the impact of mergers and acquisitions on post-acquisition performance. After the testing of their main effects models, several moderator variables were considered in their analysis. Consistent with traditional approaches to the testing of moderators in meta-analysis, the variables considered were descriptive characteristics of the sample populations or study environments. For example, they considered the variable of prior work experience as having an influence on their proposed main effects relationship. The various levels of work experience were provided in the articles being examined by the authors. Thus, the data was common across studies and was categorized as either a categorical or continuous variable which could be tested based on its presence/absence in each study.

selection process is rarely direct (Hunter & Schmidt, 2004).

Environmental variables, as they were examined here, were not study characteristics, but were variables included in the numerous EO studies. The primary difference from this approach and previously used moderators in meta-analysis studies is that variables could not simply be classified as dichotomous or continuous moderators. In contrast to the traditional approach to moderator variables in meta-analysis, the current study examined environmental moderators which have been theoretically hypothesized and empirically examined in a select group of EO studies. As a result, the correlations (or other variables capable of conversion) between each of these variables and EO were provided in each study. Traditional analysis of moderators in meta-analysis normally requires the coding (often very subjective) of various characteristics of the study. This approach enabled an objective assessment of the impact of these environmental variables based on the actual testing done by the various authors in their original studies. This new found perspective of the analysis of moderators in meta-analysis was accompanied by a plethora of theoretical and statistical questions which had to be addressed for the successful completion of the testing.

A central issue of concern in testing the moderator variables was the lack of any prior empirical work utilizing this approach in meta-analysis. The testing could not be completed by only examining the correlation values of the moderators because the outcome variable was unclear. By running the analysis on the correlations between each environmental variable and EO (or other single dimensions of EO), the test would have failed to provide any information related to firm performance. However, by analyzing the correlations between each environmental variable and firm performance,

the results would only reflect the relationship between the environment and firm performance, failing to provide any information related to the role of EO. Thus, further innovative calculations of these relationships were needed to best represent the three-way relationship among the variables.

In searching for a solution to this dilemma, I followed several different procedures. First, two leading meta-analysis texts were consulted (i.e., Hunter & Schmidt, 1990, 2004). While both of these books provided detailed information related to the analysis and computational methods associated with moderator variables in meta-analysis, neither discussed the issue I have uncovered in this project. Subsequently, I examined various websites devoted to meta-analysis and academic articles providing guidance on this methodology (e.g., DeCoster, 2004). Again, no helpful information was revealed from any of these sources. After this failed attempt, I contacted several leading researchers in meta-analysis literature for any leads on this type of moderator analysis. While several researchers were contacted, Dr. Frank Schmidt (University of Iowa) and Dr. Dan Dalton (Indiana University) served as the most useful resources I had yet found. Both of these researchers are considered pioneers in the application of meta-analysis.

Dr. Dalton provided the most useful perspective by suggesting an approach which would allow for the consideration of the impact of the environmental variables on the EO-performance relationship.⁷ This approach involved calculating the partial

⁷ It should be noted that Dr. Dalton had no experience in dealing with this type of moderation analysis in meta-analytic research and was not aware of any other study using meta-analysis that has taken this

correlation of the IV-DV relationship when considering the impact of each independent environmental (moderator) variable. By testing for differences between the observed correlation values present in the basic EO-performance relationship and the partial correlation values between these variables, the impact of each environmental variable could be deemed significant or insignificant. This requires a slightly extended explanation given the unique statistical approach.

A partial correlation represents the relationship between two variables after removing the effect of a third variable. In this study it represents the relationship between the IV and DV after removing the effect of each environmental variable (i.e., munificence, dynamism and hostility). This outcome statistic alone provides only enough information to show whether or not the original IV-DV relationship is still significant when the effects of each particular moderator are removed. However, the bivariate Pearson's correlation between the IV and DV is already available in the data set and can be utilized for comparison. Thus, by testing for significant differences between the study-provided bivariate correlations and the calculated partial correlations, I could determine whether or not the presence (or absence) of this third variable made an impact. Using calculated z-scores values for the two correlations, the two samples were tested for significant differences through analysis of an absolute z-score. Based on the outcome of this measurement, application of deductive logic leads to the conclusion of the impact of the moderator variables.

approach. He acknowledged this particular study as an innovative step in the application of meta-analysis and a future contribution to research methods in general.

Partial correlations were calculated for every study utilizing one or more of the environmental moderator variables. For example, if a particular study examined the relationship between EO and firm performance, as well as the impact of environmental dynamism, several correlation values would need to be identified in the process of determining the partial correlation between EO and firm performance. Since a bivariate correlation value represents the relationship between only two variables, the calculation of a partial correlation requires the triangulation of the relationship under study. This was achieved by obtaining several correlation values, including: 1) the correlation between the IV and the DV, 2) the correlation between the IV and the moderator (whose effect is being removed), and 3) the correlation between the DV and the moderator. The partial correlation was then calculated using the following formula.

$$r_{XY.Z} = \frac{r_{XY} - (r_{XZ})(r_{YZ})}{\sqrt{[1-r_{XZ}^2] \cdot [1-r_{YZ}^2]}}$$

Several relationships were important to the use of partial correlation analysis, including the following: IV-Moderator, Moderator-DV, and IV-DV. Each of these three correlations was required in calculating the needed partial correlation values. The process of determining whether or not the moderator variable significantly impacts the IV-DV relationship included several steps. First, using the same Hunter-Schmidt software package which was used for testing the main effects models, a meta-analysis was run using the calculated partial correlation values in place of the observed correlation values previously used. Other characteristics, such as sample size (*n*) and

reliability estimates (i.e., .80) were consistent with earlier procedures, with the sample size of each particular study examining the moderating variable being used.

Analysis of the moderating influences of the multiple environmental variables included the calculation of the following relationships: 1) EO-overall firm performance, controlling for environmental munificence, 2) EO-overall firm performance, controlling for environmental dynamism, 3) EO-overall firm performance, controlling for environmental hostility, 4) Innovativeness-overall firm performance, controlling for environmental dynamism, 5) Innovativeness-overall firm performance, controlling for environmental hostility, 6) Proactiveness-overall firm performance, controlling for environmental dynamism, 7) Proactiveness-overall firm performance, controlling for environmental hostility, and 8) Risk-taking-overall firm performance, controlling for environmental dynamism.

Several of the proposed moderating influences were not testable given the limitation of data availability. Thus, results were not computed for these relationships if either 1) there were no studies examining the relationship of interest, or 2) a sufficient number of studies examining this relationship were not available from which meta-analytic results could be reasonably interpreted. Better population estimates in each of these can be carried out in the future when a reasonable sample size is available (Hunter & Schmidt, 1990). A minimum of three studies has been noted as the reasonable number of studies with which a meta-analysis can be performed (Dalton et al., 2003; Dalton et al., 2004).

CHAPTER V

RESULTS

The Results from empirical analyses are presented in this chapter of the dissertation. Results from the testing of primary hypotheses are initially presented, along with any corresponding procedures which were necessary or appropriate for each calculation. Following these initial analyses, several opportunities for post-hoc analyses were also discovered. These findings are presented accordingly.

5.1 Results of Main Effects Models

The initial step in conducting a meta-analysis is establishing a basic population correlation through bare-bones analysis (Boyd, 1991; Dalton et al., 1998, 1999). This initial analysis also provides information related to the need for further subgroup (moderator) analysis, which was a vital step for determining whether different variations of firm performance should be analyzed. Since these procedures are directly related to the validity of the testing of moderator variables in meta-analysis, the discussion of subgroup testing procedures will be provided in following sections related to moderator analyses.

The calculation of the sample-size weighted-mean correlation, along with the standard deviation of the observed correlations, provides the most reliable estimate of the true relationship between the two variables under study. Further, these calculations

enable the researcher to determine if the variability that is observed in that correlation is a result of systematic bias or if true moderators exist. By correcting the standard deviation of the observed correlations, we can also more accurately conclude whether or not differences are based solely on sampling error.

For all meta-analyses conducted, results reported the number of studies (K), total sample size across all studies (N), average true score correlation (R_t), true score variance, true score standard deviation (SD_t), 80% confidence interval (CV), variance attributed to study artifacts or sampling error (S_e), percent variance attributed to artifacts ($\%S_e$), residual variance, residual standard deviation (SD_{Resid}), weighted-mean observed correlation (R_w), and the standard deviation of weighted correlations after sampling error variance (SD_w). Each of these values contributes to either the establishment of the overall effect size of a relationship of study or the clarification of the need for subgroup analyses. Each of these will be discussed further as results for individual relationships are detailed.

5.1.1 Entrepreneurial Orientation and Firm Performance

Hypothesis testing began with the examination of the relationship between an overall measure of entrepreneurial orientation and an overall measure of firm performance. Hypothesis one states that EO will be positively related to overall firm performance, where EO is a composite score measure of the level of innovativeness, proactiveness and risk-taking present in a firm. Fifty-six different studies provided data for the testing of this relationship. These various data points are illustrated using a

histogram (Figure 2). In the case of any study having multiple measures of firm performance, an average of the correlations between EO and each measure of performance was taken as representative of the overall performance within the study. The fifty-six studies provided a total sample size of 15,121 on which analyses were conducted. Following previous discussion, reliability was estimated at .8 (as opposed to the traditional 1.0) and a random-effects model was used with indirect range restrictions. These same two steps were carried out in all analyses conducted in this study.

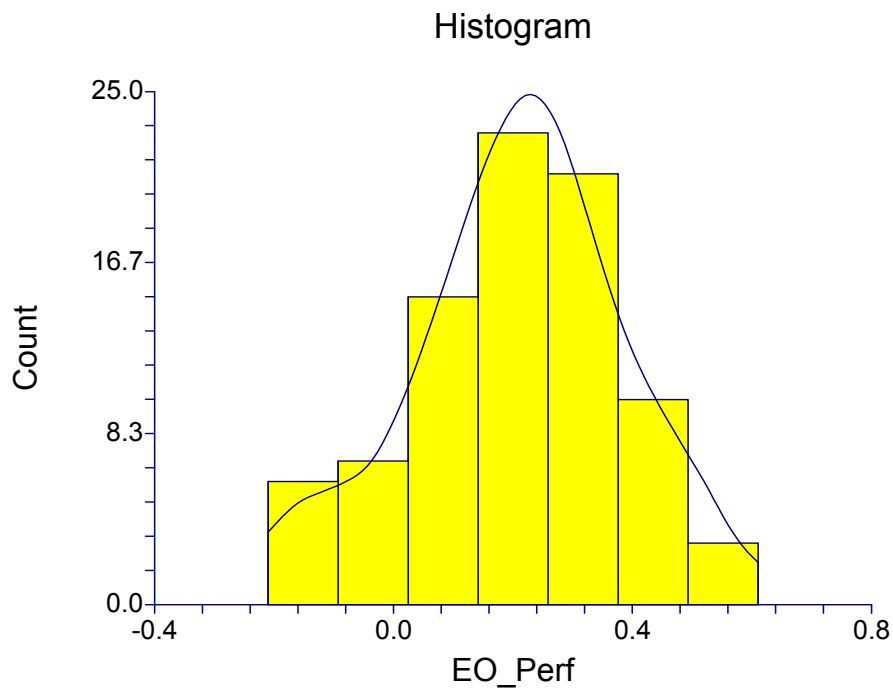


Figure 5.1 EO-Performance Correlations

An overall measure of EO was found to have a moderately high correlation with firm performance ($r = .23$),⁸ as would be suggested by Cohen (1977) and Lipsey and Wilson (2001). This correlation value represents the mean true score correlation, rather than the sample weighted mean observed correlation. The mean true score correlation is reported because it controls for all available artifacts, rather than only controlling for the sample size differences, which is what the weighted mean observed correlation represents. While both of these values are useful, and reported in Table 2, the mean true score corrects for the biasing effects of every artifact considered in the meta-analysis, while the sample weighted score corrects for sampling error only (Hunter & Schmidt, 2004). Thus, confirming hypothesis one, EO demonstrates a notably strong relationship with firm performance across the fifty-six studies examined. However, the true score variance is rather small (.023), a possible indication of the presence of moderator variables and an indication of the need for subgroup analyses.

⁸ Tests for significance in meta-analysis have been conducted in numerous ways. Most procedures have attempted to cumulate significance levels across all studies being examined, resulting in an overall p value, or significance level. With a low enough p value, researchers have concluded that the effect is established (Hunter & Schmidt, 2004). This traditional approach was developed by Mostellar and Bush (1954) and further applied in many studies (e.g., Rosenthal, 1978; Cooper & Rosenthal, 1980). However, recent research by Hunter and Schmidt (2000) has pointed out a major problem with this approach in that it assumes homogeneity, thus representing a fixed-effects model. Given the majority of meta-analyses should be conducted using a random-effects model, this causes a major problem. In addition, given the large sample sizes used in meta-analytic research, almost any study will result in a combined p value which is highly significant. For example, in their 2004 study, Dalton et al. found a correlation of .07 between acquiring firms (in an acquisition contract) and abnormal financial performance after over 3 years. This relationship was found to be significant at a .001 level, with a sample size of 5,966 from 26 studies. This significance provides no representation of the magnitude of the actual effect. The National Research Council noted these issues and recommended meta-analysis research abstain from using p value significance tests. Many researchers have resorted to the application of Cohen's (1977) suggestions for assessing the magnitude of an effect. This seems to provide at least a minimal indication of whether or not the effect is significant. However, it should not be assumed this significance testing provides any insight into the magnitude of an effect either. Other research has utilized z-score averages and tested for significance with this statistic, but Hunter and Schmidt (2004) have also noted problems with this technique.

5.1.2 Innovativeness, Proactiveness, Risk-taking and Firm Performance

The next portion of Table 2 provides meta-analytic results for each of the individual components of EO in relation to overall firm performance measures. These models were analyzed using the same procedures as those used for the EO-performance model described above. Hypothesis two states innovativeness is positively correlated with firm performance. This hypothesis was tested using a sample of 9,435, derived from 28 individual studies. Correlation values are illustrated in the histogram seen in Figure 3. Findings strongly supported hypothesis two, showing a moderately large correlation ($r = .28$) between innovativeness and overall firm performance. As with our testing of an overall measure of EO, the true score variance was again minimal, indicating possible moderating influences.

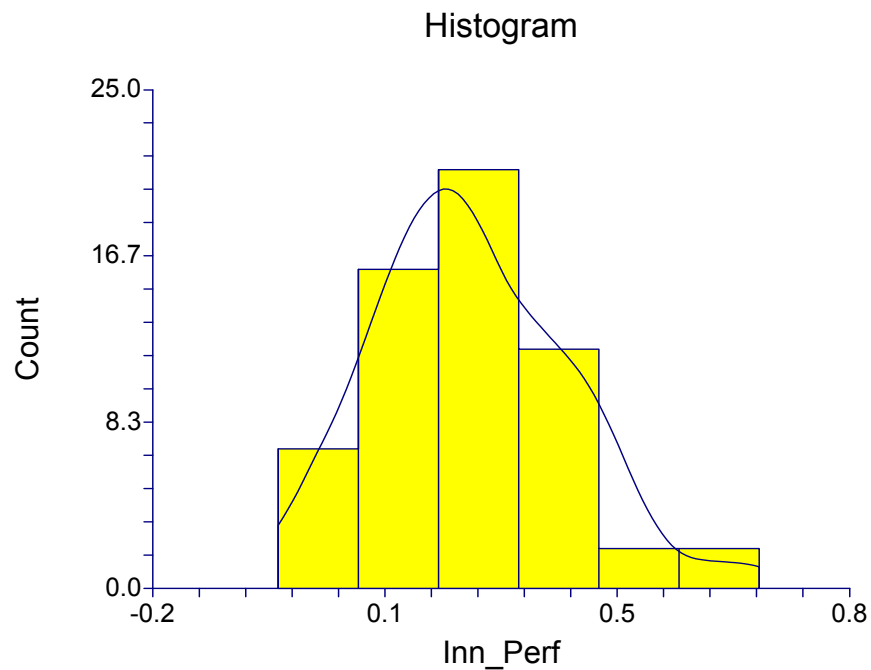


Figure 5.2 Innovativeness-Performance Correlations

The third hypothesis to be tested was for a positive relationship between proactiveness and firm performance. The number of studies relied on for this calculation was 16, with a total sample size of 7,052. Again, these data points are illustrated using a histogram (Figure 4). Consistent with the theoretical development of hypothesis three, empirical results showed a positive mean true score correlation of .20, suggesting a moderate relationship between the variables. True score variance for this model was very minimal (.008), with a standard deviation of .09.

Table 5.1 Main Effects Results

IV	DV	K	N	R_t	$R_t Var.$	$R_t SD$	80% Conf. Interval	
							10% CV	90% CV
EO	Overall Firm Performance	56	15121	0.2264	0.0229	0.1514	0.0292	0.3758
Innovativeness	Overall Firm Performance	28	9435	0.2780	0.0214	0.1463	0.0907	0.4653
Proactiveness	Overall Firm Performance	16	7052	0.2014	0.0079	0.0888	0.0878	0.3151
Risk Taking	Overall Firm Performance	15	6898	0.1819	0.0164	0.1280	0.0180	0.3457

IV	DV	S_e	(% S_e)	R_w	SD_w	Z	Sig. Test	
EO	Overall Firm Performance	0.0034	15.4577	0.2025	0.1370	0.2342		
Innovativeness	Overall Firm Performance	0.0027	16.1652	0.2224	0.1184	0.2877	$z_1 =$	5.40 **
Proactiveness	Overall Firm Performance	0.0022	29.5914	0.1612	0.0719	0.2027	$z_2 =$	1.22
Risk Taking	Overall Firm Performance	0.0021	16.3694	0.1455	0.1036	0.1820	$z_3 =$	6.67 **

* p < .05
** p < .01
 z_1 = difference in R_t between Innovativeness and Proactiveness
 z_2 = difference in R_t between Proactiveness and Risk-Taking
 z_3 = difference in R_t between Innovativeness and Risk-Taking

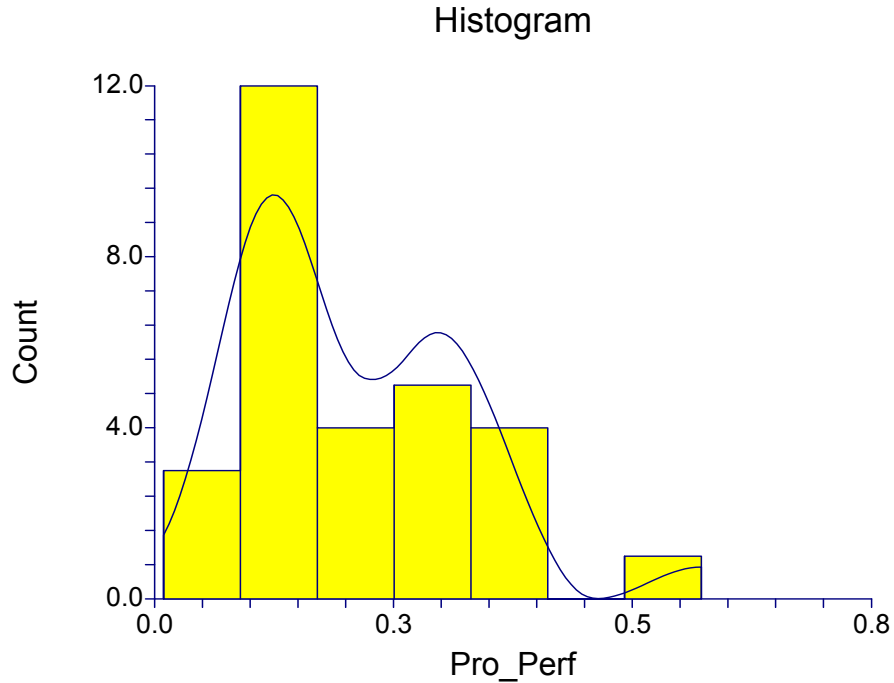


Figure 5.3 Proactiveness-Performance Correlations

Hypothesis 4 examined the relationship between the level of risk a firm pursued through high-risk investments and the resulting level of overall firm performance. Findings in this case were similar to those found in the proactiveness-performance relationship, with empirical analyses revealing a moderate correlation between the variables ($r = .18$). Testing for this relationship was based on 15 individual studies and a total sample size of 6,898 (see Figure 5).

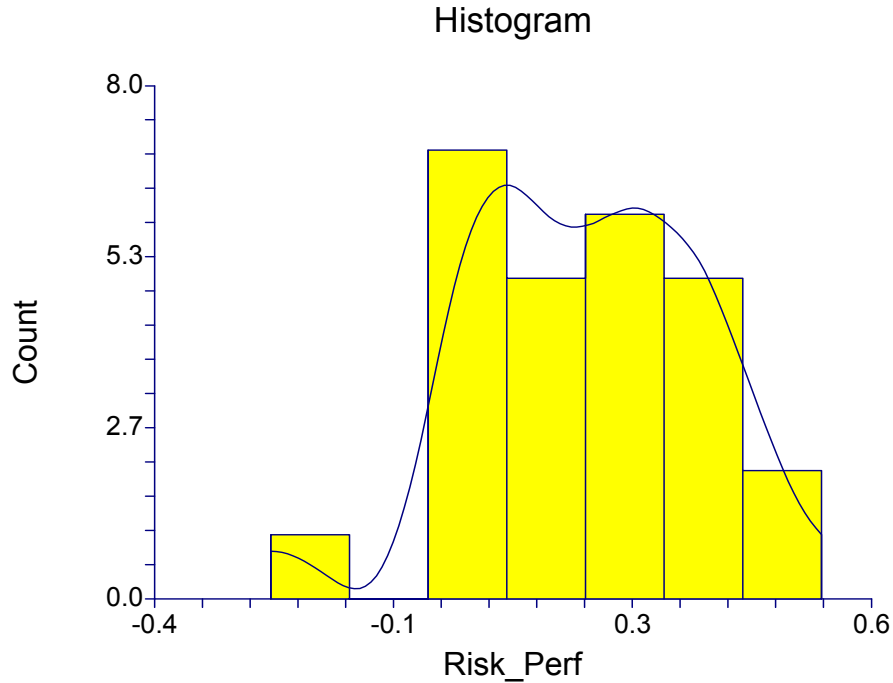


Figure 5.4 Risk-Taking-Performance Correlations

Given the theoretical discussion of the expected nonlinear relationship between risk-taking and firm performance, interpretation of this correlation value should be done with caution. One limitation to the meta-analytic procedure is the inability to consider (without subgroup analysis) the impact or presence of nonlinearity in a relationship (Eysenck, 2004). While the findings can confirm a relationship between the variables, it fails in its ability to decipher how different levels of risk-taking relate to firm performance. If data were available, this issue could be addressed by coding articles based on the level of risk taken by firms under analysis in each independent study. Unfortunately, this was not an option in the current study given two problems: 1) limitation in the amount of information provided in the various articles related to the

level of risk taken by particular firms, and 2) since meta-analysis is a study-level empirical approach, all firms within a given study would have had to pursue the same level of risk (or at the very minimum, must have been able to be coded in their risk-taking (e.g., low, moderate, or high)).

Hypotheses 5, 5_a and 5_b were the last hypotheses examining direct relationships between the unique dimensions of entrepreneurial orientation and overall firm performance. The dimensionality debate which has surfaced in EO research in recent years has received both empirical and theoretical arguments. Hypothesis 5 provides an overall test of all empirical contributions to determine if, in fact, the three contributing variables of EO relate differently to firm performance.⁹ Testing of this hypothesis required the calculation of z-scores for each overall construct correlation to enable comparison testing across calculated true-score correlation values. These z-score values were derived using the Fisher r-to-z transformation according to the formula:

$$z_r = .5 [\log(1 + r) - \log(1 - r)]$$

With the standard error of z_r being calculated as:

$$SE_{z_r} = 1/\sqrt{n - 3}$$

⁹ Testing is based on the relationship of innovativeness, proactiveness, and risk-taking with firm performance rather than an overall measure of EO due to the embedded nature of the predictive measurement variables. That is, in all studies examined in which measures of all four constructs (i.e., EO, innovativeness, proactiveness, and risk-taking) were available, EO scores were directly derived from Likert scale scores of the other variables. Thus, there is an embedded contribution of .33 for each of the contributing variables, resulting in the inability of testing for differences in contribution of the three variables to an overall measure of EO. Thus, this hypothesis was carried out by testing for equal contribution of each variable to firm performance given this has been the most commonly utilized dependent variable of study in EO literature.

The calculated z-scores can be seen in Table 2 and were used for comparison testing. After correlation values for each relationship (i.e., Inn-Performance, Pro-Performance, and Risk-Performance) were converted to z-scores, Hypotheses 5_a and 5_b were examined by testing for significant differences between z-score values of each relationship. Hypothesis 5_a was tested by comparing z-scores of innovativeness-performance ($z = .2877$) with proactiveness-performance ($z = .2027$) and risk-taking-performance ($z = .1820$) z-score values. The difference between z-score values is found to be significant at the .05 level if the absolute z (i.e., the z-score of the difference between two z-scores) exceeds 1.96 and at the .01 level if the absolute z exceeds 2.58. The resulting values for each test can be seen in Table 2. Findings confirmed that the absolute z between innovativeness-performance and proactiveness-performance was significant at the .01 level, confirming the relationships are significantly different, with innovativeness having a significantly stronger relationship with firm performance. Further, the absolute z between innovativeness-performance and risk-taking-performance was significant at the .01 level, confirming the unequal contributions of innovativeness and risk-taking to firm performance. These two findings provide strong support for Hypothesis 5, that the three individual variable of EO are *not* equal contributors to firm performance, and Hypothesis 5_a, that innovativeness is a stronger predictor of firm performance than either proactiveness or risk-taking.

Hypothesis 5_b stated that proactiveness was a stronger predictor of firm performance than risk-taking. This hypothesis was tested following the same procedures described above utilizing calculated z-score and statistically testing for

significant differences in the absolute z . The absolute z between innovativeness-performance and risk-taking-performance was not found to be significant, providing no support for Hypothesis 5_b. However, as discussed above, the nonlinearity of the risk-taking-performance relationship is a likely explanation for this insignificant finding.

5.2 Results of Moderating Variables Models

Numerous techniques have been used by meta-analysis researchers in the identification of possible moderators of the primary relationship of interest. While the current study provided theoretical support for the testing of multiple environmental moderator variables, testing/validation procedures were still considered beneficial to ensure these variables meet basic criterion for inclusion in such a study setting. Further, this form of testing for moderators also reveals other possible moderators for consideration in post-hoc analysis. Steps for such testing can be difficult and often misleading as minor details of study characteristics can greatly impact the methods acquired.

In applying meta-analysis procedures, many authors have selected the use of confidence intervals to determine whether or not moderator variables are present which have a significant impact of the relationship being examined. However, several authors have suggested that the use of credibility intervals is more appropriate for this type of analysis (e.g., Hunter & Schmidt, 2004; Kuncel et al., 2005). As Hunter and Schmidt

(2004) indicate, the distinction between credibility and confidence intervals in their application in meta-analysis is very important. Confidence intervals provide detail related to the extent to which a finding in a study is due to the sampling error reported. In contrast, credibility intervals provide a test for moderators across samples and situations being observed. As Kuncel et al. (2005: 341) explain, this distinction seeks to explain “whether the differences in the observed correlations are due to real moderator effects or simply to sampling error and other statistical artifacts.” In this case, the credibility interval takes into consideration the possibility that sampling error may, in fact, be due to various observed differences, and provides the best estimate of the range of true difference based on this consideration.

The utilization of credibility intervals in meta-analysis is linked to the application of a random-effects approach, given that random-effect meta-analysis models allow study parameters to vary across studies (consistent with the current study). In providing evidence of the need for subgroup analyses (i.e., moderator analyses) in the current study, credibility intervals were examined, along with testing for homogeneity of the sample through analysis of sampling error. These methods and results are described in detail below.

Reported results show the 80% credibility intervals and sample-size weighted observed standard deviations for each of the four main effects models (Table 2). Credibility intervals excluding zero indicate that 90% of the individual correlations

examined in the study excluded zero.¹⁰ Hunter and Schmidt (1990) conclude that if the credibility intervals exclude zero, we can have some confidence that a relationship generalizes across variables examined in the study. In the current meta-analysis, lower bounds of credibility intervals were all greater than zero, but variance is visible in the correlations after corrections. Further, Kowloswky and Sagie (1993) have suggested that subgroups (i.e., moderators) are present and should be tested for when a 90% credibility interval exceeds a .11 level. The current study used a more conservative approach in testing for the need for subgroup analyses in that 80% credibility intervals were examined. In the case of all four main effects models, the credibility intervals exceeded .11, indicating the need for subgroup analyses for all models. In fact, three of the main effects relationships showed credibility intervals that were approximately three times larger (EO-firm performance, $CV = .35$; Innovativeness-firm performance, $CV = .37$; Proactiveness-firm performance, $CV = .23$; Risk-taking-firm performance, $CV = .33$) than the .11 level standard provided by Kowloswky and Sagie (1993).

Form Table 2, the percent of variance attributed to sampling error in each of the analyses was less than 75%, ranging from 15.46% (EO-firm performance) to 29.59% (Proactiveness-firm performance), indicating there is sufficient evidence of moderators in each of the relationships (Hunter & Schmidt, 1990, 2004). The moderating relationships theoretically developed in previous discussion were tested using meta-analyses of partial correlation values. Calculated partial correlations (i.e., the

¹⁰ This value represents the 80% of studies that fall in the credibility interval and the 10% that fall above the credibility interval.

correlation between the IV and DV after removing the effect of the suspected moderator) were tested to determine if a significant difference existed between them and the original correlation between the IV and DV. Results specific to each environmental moderating variable are discussed in the following paragraphs.

5.2.1 Moderating Influence of Environmental Munificence

Hypotheses 6-9 focused on the impact the level of environmental munificence present in an environment would have on the EO-performance relationship, the innovativeness-performance relationship, the proactiveness-performance relationship, and the risk-taking-performance relationship. As previously discussed, hypothesis testing was dependent upon the availability of an adequate number of empirical studies examining each relationship. Several hypotheses were not testable due to the lack of data available in existing literature. Unfortunately, research examining the impact of environmental munificence in an entrepreneurial setting has received the most limited amount of interest out of all examined environmental variables. Thus, empirical examination of the influence of environmental munificence was limited to its impact on the EO-performance relationship. Thus, hypotheses 7-9 were not testable given these data limitations.

The calculated partial correlation of the EO-performance relationship after controlling for environmental munificence was .2723 (See Table 3 for partial correlation values). This calculated partial correlation was compared to the calculated EO-performance correlation (.2264) using the z-test approach described previously.

Through deductive logic, it was to be assumed that if there was a significant difference between the two values, environmental munificence is a moderator of the EO-performance relationship. Findings resulted in an absolute z-score of 1.64, failing to support the hypothesized impact of environmental munificence. Thus, no support was found for hypothesis 6.

5.2.2 Moderating Influence of Environmental Dynamism

Hypotheses 10-13 focused on the impact of environmental dynamism on the various EO and EO subdimensions' relationships with firm performance. Environmental dynamism was found to be the most commonly studied environmental variable in EO research, as can be seen by the number of studies used in each calculation of the partial correlations. The strong presence of research examining this variable enabled the testing of all hypotheses examining the impact of environmental dynamism.

Hypothesis 10 predicted environmental dynamism would moderate the relationship between EO and firm performance. The calculated partial correlation (.3151) was compared to the original mean true score correlation between EO and firm performance (.2264). The correlations were significantly different at the .01 level, confirming dynamism as a moderator of the EO-performance relationship. Thus, hypothesis 10 is supported.

Following the same approach, hypotheses 11-13 investigated the impact of environmental dynamism on the relationship between each unique dimension of EO and firm performance. To begin these tests, the mean true score correlation for the relationship between innovativeness and firm performance (.2780) was compared with the calculated true mean score correlation of the partial correlation after removal of the environmental dynamism variable (.1946). Results were significantly different at the .01 level, confirming dynamism as a moderator of the innovativeness-firm performance relationship and supporting hypothesis 11. Again following the same approach, the moderating impact of environmental dynamism on the proactiveness-firm performance relationship was assessed in testing hypothesis 12. Analyses resulted in an absolute z-score of 1.30, failing to support environmental dynamism as a moderator of the relationship between proactiveness and firm performance. Thus, hypothesis 12 was not supported.

Hypothesis 13 stated environmental dynamism moderated the relationship between risk-taking and firm performance. The difference between the original true score correlation (.1819) and the calculated partial correlation (.0798) was found to be significant at the .01 level, supporting hypothesis 13. However, this result should be interpreted with skepticism, or at least caution, given the expected nonlinear relationship between risk-taking and firm performance. Given this expected relationship between the IV and DV in this case, we can conclude that dynamism serves as a moderator of this relationship, but interpreting the direction of the impact of this moderator variable is not possible in this situation.

Table 5.2 Results of Moderating Variables and Partial Correlation Analyses

IV	DV	K	N	R_t	$R_{tvar.}$	R_{tSD}	80% Conf. Interval	
							10% CV	90% CV
EO . Munificence	Overall Firm Performance	5	1643	0.2723	0.0287	0.1695	0.0554	0.4893
EO . Dynamism	Overall Firm Performance	23	4481	0.3151	0.0476	0.2181	0.036	0.5943
EO . Hostility	Overall Firm Performance	11	5127	0.142	0.0104	0.1021	0.0113	0.2727
Inn. Munificence	Overall Firm Performance	n/a						
Inn . Dynamism	Overall Firm Performance	7	2766	0.1946	0.0277	0.1663	-0.0183	0.4075
Inn . Hostility	Overall Firm Performance	4	538	0.3064	0.0724	0.269	-0.038	0.6508
Pro. Munificence	Overall Firm Performance	n/a						
Pro. Dynamism	Overall Firm Performance	7	2330	0.1729	0.0142	0.119	0.0205	0.3253
Pro. Hostility	Overall Firm Performance	3	250	0.1883	0	0	0.1883	0.1883
Risk. Munificence	Overall Firm Performance	n/a						
Risk. Dynamism	Overall Firm Performance	6	2236	0.0798	0.0158	0.1255	-0.0808	0.2405
Risk. Hostility	Overall Firm Performance	n/a						

5.2.3 Moderating Influence of Environmental Hostility

The final hypothesized moderator analyzed was environmental hostility. Hypotheses 14-17 stated the expected influence of environmental hostility on the relationship between EO and firm performance, as well as its impact on the relationship of each unique dimension of EO with firm performance. Similar to the environmental munificence variable, the availability of data was a factor in the ability to test these relationships. While sufficient data was available from past research examining the impact of environmental hostility on the EO-performance, innovativeness-performance, and proactiveness-performance relationships, there was not an adequate amount of data

from an acceptable number of studies to examine its impact on the risk-taking-performance relationship.

Table 5.3 - continued

IV	DV	S_r	(% S_r)	R_w	SD_w	Z	Sig. Test
EO . Munificence	Overall Firm Performance	0.0028	12.841	0.2179	0.1372	0.2769	$z_8 = 1.64$
EO . Dynamism	Overall Firm Performance	0.0045	12.7178	0.2521	0.1765	0.3316	$z_9 = 5.72^{**}$
EO . Hostility	Overall Firm Performance	0.0021	23.5669	0.1136	0.0826	0.1409	$z_{10} = 5.77^{**}$
Inn. Munificence	Overall Firm Performance	n/a					
Inn . Dynamism	Overall Firm Performance	0.0024	11.8167	0.1557	0.1346	0.1923	$z_{11} = 4.41^{**}$
Inn . Hostility	Overall Firm Performance	0.0066	12.2705	0.2451	0.2178	0.3205	$z_{12} = 0.74$
Pro. Munificence	Overall Firm Performance	n/a					
Pro. Dynamism	Overall Firm Performance	0.0029	23.9186	0.1383	0.0963	0.1717	$z_{13} = 1.30$
Pro. Hostility	Overall Firm Performance	0.0116	125.9492	0.1506	0	0.1923	$z_{14} = 0.16$
Risk Munificence	Overall Firm Performance	n/a					
Risk Dynamism	Overall Firm Performance	0.0027	20.6496	0.0639	0.1016	0.0802	$z_{15} = 4.18^{**}$
Risk Hostility	Overall Firm Performance	n/a					

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

z_8 = difference in R_t between EO and Perf and EO and Perf controlling for Munificence
 z_9 = difference in R_t between EO and Perf and EO and Perf controlling for Dynamism
 z_{10} = difference in R_t between EO and Perf and EO and Perf controlling for Hostility
 z_{11} = difference in R_t between Inn and Perf and Inn and Perf controlling for Dynamism
 z_{12} = difference in R_t between Inn and Perf and Inn and Perf controlling for Hostility
 z_{13} = difference in R_t between Pro and Perf and Pro and Perf controlling for Dynamism
 z_{14} = difference in R_t between Pro and Perf and Pro and Perf controlling for Hostility
 z_{15} = difference in R_t between Risk and Perf and Risk and Perf controlling for Dynamism

This data limitation was interesting because there were an acceptable number of recorded correlations which were tested analyzing environmental hostility as a moderator of the risk-taking-performance relationship. However, several of these correlations came from the same study, which measured environmental hostility in multiple ways. Only one other recorded study reported the moderating influence of environmental hostility on this relationship. As described earlier, the minimal number of studies on which a meta-analysis can be conducted is three. Thus, even though there were a significant number of available correlations to conduct a meta-analysis, this

moderating impact was not testable given these correlations only came from two separate studies.

Hypothesis 14 stated environmental hostility moderates the relationship between EO and firm performance. Calculating the absolute z-score, true mean score (.2264) and partial (.1420) correlations were compared, showing a significant difference at the .01 level. This supports hypothesis 14, confirming the moderating impact of hostility on the EO-performance relationship.

The same procedures were used in analyzing the moderation impact of hostility on the innovativeness-performance and proactiveness-performance relationships. Results showed no support for either hypothesis 15 or 16, with both z-scores being low (Innovativeness-performance, $z = -0.74$; Proactiveness-performance, $z = 0.16$). Implications of these findings and previously discussed empirical results are discussed in the following chapter. A summary of empirical findings can be seen in Table 5.3.

Table 5.3 Summary of Results

<u>Hypothesis</u>	<u>Result</u>	<u>Hypothesis</u>	<u>Result</u>
1	Supported	9	N/A
2	Supported	10	Supported
3	Supported	11	Supported
4	Supported	12	Not Supported
5	Supported	13	Supported
5A	Supported	14	Supported
5B	Not Supported	15	Not Supported
6	Not Supported	16	Not Supported
7	N/A	17	N/A
8	N/A		

CHAPTER VI

DISCUSSION

This study has focused exclusively on the entrepreneurial orientation of firms and how this orientation impacts firm performance. Given the meta-analytic approach utilized, an extensive literature review and exhaustive analysis of previous literature was required. As a result, there are many empirical and theoretical implications which have emerged from the present study. The following paragraphs will discuss these implications, initially focusing on a discussion of the empirical results obtained from the statistical analyses and later moving to a theoretical discussion of the current state of the field and particular areas of concern which have been identified.

6.1 Discussion of Empirical Findings

Empirical analyses provided several interesting points for discussion. As was expected, a higher entrepreneurial orientation was found to be positively correlated with overall firm performance. However, once a multidimensional perspective was taken, insight was gained related to the various unique relationships of the EO variables and firm performance. This leads to several interesting topics deserving of additional discussion.

6.1.1 Firm-Level Entrepreneurship and Firm Performance

One of the most intriguing findings relates to the dimensionality of the EO construct. The overall measure of EO showed a significant, and positive, correlation with firm performance. This was expected given the widespread empirical support for this relationship. In further support of past research, the analysis of the independent dimensions of innovativeness, proactiveness and risk-taking also showed significant correlations between each of the variables and firm performance. More important however, it is the strength of each variable's relation with firm performance that provides insight into the dimensionality debate. For example, the correlation between innovativeness and firm performance was found to be significantly stronger than either the relationship between proactiveness and firm performance or the relationship between risk-taking and firm performance. This provides clear evidence in support of Lumpkin and Dess' (1996) contention that the variables can, and do, vary independently. This also supports the findings of past empirical studies using factor analysis techniques to examine this issue.

However, the empirical support provided by this study for the multi-dimensional approach should not be considered adequate for the dismissal of the unidimensional approach. The same theoretical issues which existed prior to these results still require consideration when trying to bring this debate to a close. Suggestions for the integration of these empirical findings and the existing theoretical

arguments are provided later in this chapter, along with a proposed weighted unidimensional construct measure of EO.

6.1.2 Discussion of Moderators

A second area of discussion stemming from the meta-analytic results is the observed impact of the various environmental variables as moderators of the main effects relationships. A surprising finding was the minimal impact of environmental munificence on the EO-performance relationship. While the impact of environmental munificence was not found to be significant, the observed correlation between EO and firm performance actually *increased* after its removal. There are several possible explanations for the insignificance of this moderator variable. First, it was not possible to categorize firms based on the type of business environment they were operating under. For instance, the level of environmental munificence might have a much stronger impact on small startup firms with minimal disposable resources, while larger corporations implementing entrepreneurial behavior are less likely to be influenced by a lag in available resources. A second reason could be the inability to classify the data observed by industry. Resource availability and competition for these resources are often directly related to the industry in which a firm is competing (Barnett, 2004). Thus, future research should continue to examine the impact of environmental munificence on entrepreneurial behavior in more specified settings.

Empirical results for environmental dynamism confirmed the variable as a significant moderator of the EO-performance, innovativeness-performance, and risk-

taking-performance relationships. Given the level of competition for capitalizing on emerging market opportunities and the resulting fast-paced environment that characterizes many entrepreneurial firms, these findings were expected. However, contrary to what most researchers would expect, the removal of the impact of dynamism on the EO-performance relationship resulted in a stronger relationship between the IV and DV. While data interpretation is difficult when determining the direction of an impact using partial correlations, this still suggests dynamism has a negative impact on entrepreneurial behavior and success. Results of past research in this area of study have been inconsistent.

Lumpkin and Dess (2001) stressed the importance of proactive behavior in dynamic environments and how proactive firms were better able to capitalize on emerging opportunities. In a similar way, Miller (1988) pointed out the importance of innovative behavior in dynamic environments. However, these studies focus on the impact of dynamism on the various independent variables, rather than the outcome effect on firm performance. Therefore, concluding dynamism simply has a negative impact on performance is an inadequate explanation. Dynamism should be considered in entrepreneurial firms and non-entrepreneurial firms in relation to performance to fully capture this impact. In this way, while dynamism may have a negative impact on the relationship between EO and firm performance, that impact might be significantly less in entrepreneurial firms than in non-entrepreneurial firms.

The third moderator examined, environmental hostility, impacted the EO-performance and innovativeness-performance relationships differently. The partial correlations for this moderator in the EO-performance relationship resulted in a significant reduction in the correlation between the IV and DV, suggesting hostility spurs entrepreneurial behavior. However, the opposite was found when examining the partial correlations for this moderator in the innovativeness-performance relationship. These inconsistent findings could be due to the minimal sample sizes used for analyses ($k = 11$ and $k = 4$). Future research should examine the impact of each of these environmental moderators in various entrepreneurial settings.

6.1.3 Weighted Unidimensional Construct of Entrepreneurial Orientation

Empirical findings in this study supported the suggestion that the dimensions of entrepreneurial orientation have unique and varying relationships with firm performance. While this finding supports past research arguing for a multidimensional measurement of the EO construct (e.g., Lumpkin & Dess, 1996), a more theoretically accurate and empirically acceptable approach in measuring EO is possible.

Study findings have supported the idea that the three dimensions of EO do not equally contribute to the performance of a firm. Further, theoretical arguments have required the presence of all three EO variables for a firm to be considered entrepreneurial. By following the empirical suggestions and moving to a multidimensional measure of EO, theoretical arguments would be violated in that a firm would not be required to have a presence of all EO variables to still be considered

entrepreneurial. However, by continuing to measure EO as a unidimensional construct following commonly accepted procedures, research fails to acknowledge, or calculate for, the varying contribution of the independent dimensions.

One solution to this issue is the application of a weighted unidimensional construct of EO. While exact weighting would need to be established through further empirical study, the current meta-analytic findings provide a foundation for these future studies. In this weighted unidimensional approach, an EO score would be calculated based on two criteria: 1) the extent to which the optimal level of each variable is present in the firm (i.e., high level of innovativeness, high level of proactiveness, and moderate level of risk-taking) and 2) the calculated importance of each variable in its contribution to entrepreneurship. Given firm performance has been the most commonly examined dependent variable in EO research, the contribution of each variable in relation to firm performance is an obvious starting point for calculating the weighted contribution of each variable.

While results and data from the current study do not allow testing this proposed approach (given that no actual Likert scores are available), a verbal discussion of the application of this procedure is still beneficial. Findings from the current study showed a much stronger correlation between the innovativeness ($r = .28$) dimension and firm performance than either the proactiveness ($r = .20$) or risk-taking ($r = .18$) dimensions and firm performance. Following a weighted unidimensional approach, this difference in contribution from each of the three individual variables would be accounted for in

statistical analyses by using a multiplicative calculation (I x P x R) of an EO score, rather than the traditionally utilized additive EO score (I + P + R). Further, values used for calculation would *not* be the raw Likert scores, but the weighted Likert scores.

Several calculations were performed in determining the proposed weighting values for each of the three dimensions. First, the total correlation from the three variables was summed ($\sum r = .66$). This summarized value is not assumed (or intended) to represent the total correlation of these variables with firm performance, but was a necessary calculation for following calculations. Percent contributions were then calculated for each of the variables, resulting in the following weighting values: Innovativeness (42.4%), Proactiveness (30.3%), and Risk-taking (27.3%). The multiplicative calculation introduced above ensures at least a minimal presence of each variable, supporting the theoretical arguments developed by many EO researchers (e.g., Miller, 1983; Covin et al., 2006). Thus, following this weighted unidimensional approach; the contributions of each variable would be weighted according to these values and then multiplied to produce the overall EO score.

6.1.4 Further Empirical Analyses

A benefit of the use of the meta-analytic procedure is the ability to identify and test for the existence of moderator variables of a particular relationship. In the current study, the data collection process consisted not only of the collection of the correlations under study, but involved the recording and coding of any study characteristics from the base sample population. This approach provided some very interesting prospects for

post-hoc analyses. These post-hoc analyses included, but were not limited to, testing for differences based on objective versus subjective measures of firm performance, various types of performance used as a dependent measure, the use of the Miller/Covin and Slevin (MCS) scale versus the use of a different measure of EO, and the sample population being either domestic or international.

In the data collection process, the variety of measures used for examining a firm's performance was evident. Thus, it seemed important to establish whether these different types of measures showed varying relationships with firm performance. The first test conducted in the examination of this data categorized the firm performance variables based on whether they were subjective responses of the reporting subject regarding their firm's performance or objective measures of raw data provided by either the subject or secondary data gathered by the researcher. Past EO research has often cited the accuracy of subjective measures of performance (in relation to actual objective data), following the works of Dess and Robinson (1984) and Venkatraman and Ramanujam (1987) (e.g., Lumpkin & Dess, 2001). However, the categorization of these studies by the type of approach they used in the measurement of the performance variable enabled the testing of these claims. Calculated true mean score correlations for each subgroup revealed that those studies using subjective measures of performance showed a much stronger correlation with EO ($r = .277$) than those studies using objective performance measures ($r = .227$). This difference was found to be highly significant ($p < .01$). This suggests one of two things: Either 1) respondents overstate their actual firm's performance or 2) the objective measures used in previous studies are

not fully capturing the performance of the organization. It is likely there is error in both measures but this empirical finding should stimulate further research attempts to triangulate the relationship under study, rather than continue to simply replicate past procedures.

Data was also gathered which showed the various measures used in evaluating the performance variable. While data limitations did not allow the testing of relationships for every performance variable, several were possible for each of the main effects relationships. First, the most commonly used performance measures for the EO-performance studies were profitability ($k = 4$), sales growth ($k = 8$), ROI ($k = 3$), and ROE ($k = 4$). Subgroup meta-analyses were run for each of these and the true mean score correlation of each was compared against the others. These results can be found in Table 5. In summarizing these findings, sales growth was found to have a much stronger correlation with EO ($r = .36$) than any of the other variables, with the second strongest being ROI ($r = .198$). This suggests that the entrepreneurial behavior of a firm has the greatest influence on a firm's growth in sales. It should be noted that the cross-sectional nature of this study is likely to be a primary reason for the low correlation values found for profitability, ROE and ROI. It often takes firms several years to yield profits or a strong return on investment when pursuing entrepreneurial ventures. EO research to this point has failed to provide an adequate amount of longitudinal studies as is evidenced by the literature reviewed for the current analysis. Of the many studies examined, only two were longitudinal and both of these were studies that spanned over

Table 6.1
Results of Post-Hoc Analyses

IV	DV	K	N	R_e	$R_{e, Inn}$	$R_{e, ID}$	SD_e	Z	Sig. Test	
EO	Performance (Self-Reported)	42	12462	0.2766	0.0319	0.1785	0.0031	0.2877	$z_4 =$	3.01 **
EO	Performance (Objective)	19	4246	0.2272	0.0185	0.1359	0.0042	0.2342		
Innovativeness	Performance (Self-Reported)	19	8283	0.2805	0.0248	0.1574	0.0021	0.2877	$z_5 =$	2.36 *
Innovativeness	Performance (Objective)	12	2370	0.3294	0.0093	0.0964	0.0044	0.3428		
Proactiveness	Performance (Self-Reported)	14	6899	0.2091	0.0105	0.1025	0.0019	0.2132	$z_6 =$	0.00
Proactiveness	Performance (Objective)	3	791	0.2112	0	0	0.0036	0.2132		
Risk Taking	Performance (Self-Reported)	12	6590	0.194	0.022	0.1484	0.0017	0.1923	$z_7 =$	1.81
Risk Taking	Performance (Objective)	4	946	0.2507	0.0073	0.0852	0.0039	0.2554		

* p < .05

** p < .01

z_4 = difference in Rt between subjective/objective measures of firm performance and EO

z_5 = difference in Rt between subjective/objective measures of firm performance and Inn.

z_6 = difference in Rt between subjective/objective measures of firm performance and Pro.

z_7 = difference in Rt between subjective/objective measures of firm performance and Risk

IV	DV	K	N	R_e	$R_{e, Inn}$	$R_{e, ID}$	SD_e	Z	Sig. Test	
EO	Profitability	4	4103	0.1492	0.0003	0.0171	0.001	0.1511	$z_{16} =$	8.31 **
EO	Sales Growth	8	2023	0.3602	0.0067	0.082	0.0033	0.3769	$z_{17} =$	1.17
EO	ROA	n/a							$z_{18} =$	0.85
									$z_{19} =$	3.72 **
EO	ROI	3	592	0.1976	0.019	0.1379	0.0048	0.2027	$z_{20} =$	4.90 **
EO	ROE	4	922	0.1817	0	0	0.0042	0.182	$z_{21} =$	0.39
Innovativeness	Profitability	5	2001	0.0812	0.0084	0.0915	0.0025	0.0802	$z_{22} =$	2.67 **
Innovativeness	Sales Growth	7	2369	0.1636	0.0085	0.0922	0.0029	0.1614	$z_{23} =$	7.13 **
Innovativeness	ROA	n/a								
Innovativeness	ROS	4	511	0.4065	0.0299	0.173	0.0063	0.4346	$z_{24} =$	5.59 **
Proactiveness	Profitability	4	1,918	0.1842	0	0	0.002	0.182	$z_{25} =$	0.63
Proactiveness	Sales Growth	4	1870	0.1645	0.0032	0.0564	0.0021	0.1614		
Risk-Taking	Profitability	3	1824	0.1071	0	0	0.0016	0.1104	$z_{26} =$	0.61
Risk-Taking	Sales Growth	4	1873	0.0921	0.0007	0.0272	0.0021	0.0902		
Covin/Slevin Non-Covin/Slevin	Overall Firm Performance	43	11807	0.2433	0.0282	0.168	0.0034	0.248	$z_{27} =$	-1.92
	Overall Firm Performance	16	4042	0.2756	0.0309	0.1758	0.0036	0.283		
Domestic	Overall Firm Performance	33	6516	0.2545	0.0368	0.1918	0.0047	0.26	$z_{28} =$	0.62
International	Overall Firm Performance	27	9639	0.2445	0.0236	0.1538	0.0026	0.25		

* p < .05

** p < .01

z_{16} = difference in Rt between EO and Perf based on measurement of Perf as Profitability vs. Sales Growth

z_{17} = difference in Rt between EO and Perf based on measurement of Perf as Profitability vs. ROI

z_{18} = difference in Rt between EO and Perf based on measurement of Perf as Profitability vs. ROE

z_{19} = difference in Rt between EO and Perf based on measurement of Perf as Sales Growth vs. ROI

z_{20} = difference in Rt between EO and Perf based on measurement of Perf as Sales Growth vs. ROE

z_{21} = difference in Rt between EO and Perf based on measurement of Perf as ROI vs. ROE

z_{22} = difference in Rt between Inn and Perf based on measurement of Perf as Profitability vs. Sales Growth

z_{23} = difference in Rt between Inn and Perf based on measurement of Perf as Profitability vs. ROS

z_{24} = difference in Rt between Inn and Perf based on measurement of Perf as Sales Growth vs. ROS

z_{25} = difference in Rt between Pro and Perf based on measurement of Perf as Profitability vs. Sales Growth

z_{26} = difference in Rt between Risk and Perf based on measurement of Perf as Profitability vs. Sales Growth

z_{27} = difference in Rt between EO and Perf based on measurement of EO using/not using MCS scale

z_{28} = difference in Rt between EO and Perf based on measurement of EO in Domestic or International environment

only two years (e.g., Wiklund & Shepherd, 2005). This observation is further discussed as an area of future study later in this manuscript.

The relationship between innovativeness and firm performance was also examined based on the various measures used for the performance variable. Data allowed for the calculation of correlations for innovativeness and profitability, sales, growth and ROS. These analyses again resulted in some intriguing findings as profitability ($r = .081$) and sales growth ($r = .164$) were found to have much lower correlations with innovativeness than ROS ($r = .407$). Performance variables in relation to the proactiveness and risk-taking constructs only provided enough data to analyze differences based on performance measured as profitability and sales growth. In each of these analyses, profitability showed a slightly higher correlation with proactiveness and risk-taking than sales growth, but this difference was not found to be significant.

Another area of interest for post-hoc analyses was the use of the MCS measurement tool. As mentioned earlier, the prevalent use of this tool in EO research has led to consistency in the field as well as questions about the negative impact of this consistency. Thus, I was interested in whether or not the application of this scale in comparison to others resulted in differing relationships with firm performance. Forty-three studies from this analysis used some form of the MCS scale, while only 16 used some other measurement of EO. After calculating the subgroup true mean score correlation, the total difference was minimal (MCS Scale, $r = .243$; non-MCS Scale, $r = .276$). Further analyses confirmed the difference in these correlations was not

significant. While these results should eliminate the uncertainty of the differences between the different measures of EO, this should not be interpreted to mean this scale is fully sufficient in measuring the EO construct. The refinement, theoretically and empirically, of the construct should continue to ensure the EO construct is capturing all entrepreneurial practice in the most effective way.

The final post-hoc analysis presented in this discussion is that of the difference in EO based on its use in domestic versus international settings. Recent research has questioned the applicability of EO in international settings (e.g., Jogaratnum & Tse, 2006; Kropp et al., 2006). Most of this argument centers on the suggestion that western theories and measurements are not always applicable or generalizable in non-western contexts. However, meta-analytic findings did not support these arguments. In a very balanced comparison (i.e., domestic, $k = 33$; international, $k = 27$), the calculated correlations from domestic settings ($r = .255$) and international settings ($r = .245$) were not found to be statistically different. While the argument against the generalizability of the EO construct can be made when particular environmental characteristics are present, an overall comparison suggests the EO construct is very consistent when used in varying geographical settings.

6.2 Discussion of Theoretical Analysis

As previously mentioned, the current study has revealed several theoretical issues related to the entrepreneurial orientation construct that are noteworthy for discussion. The following paragraphs will discuss each of these areas and should be considered possible avenues for future research.

6.2.1 Scale Variability

The field of entrepreneurship has benefited from the general acceptance of entrepreneurial orientation as a primary construct. Further, the efforts of pioneers such as Miller (1983) and Covin and Slevin (1986, 1988, 1989) have enabled the rapid development of EO as a specific area of study. These authors provided a foundation and scale that was met with wide agreement among contributing authors. The replication of this instrument has been evidence of this acceptance in main stream entrepreneurship research. As a result, the use of the MCS scale for measuring EO has been most commonly found in extant literature. While researchers in general can benefit from the across-study agreement, we must also recognize the possible dangers that surface with this rampant utilization of a single construct measurement.

Numerous studies have attempted to extend and/or refine the measures of EO. For example, Lumpkin and Dess (1996) suggested the addition of two variables: autonomy and competitive aggressiveness. This suggestion has been applied in several empirical studies since its introduction (e.g., George et al., 2001). Other research has

suggested the removal of the risk-taking construct and the addition of other variables, such as strategic renewal (Kreiser et al., 2002). This further intensifies the issues surrounding the EO construct in that the authors suggest one of the primary variables used in previous research should not be considered a predictor of entrepreneurial behavior at all. These two examples highlight the need for further development of the core variables contributing to firm-level entrepreneurship. Future research should continue to both theoretically and empirically examine this issue as it lies at the heart of the entrepreneurship field.

6.2.2 Issues of Empirical Triangulation

Another issue has surrounded the consistency in use of survey data in measuring the EO construct. Previous discussion has alluded to the possible issues related to the overuse of a single type of measurement of any variable (i.e., the MCS scale for EO). One result of this dominant use of a single measurement of EO has been the failure of research to adequately utilize proxy variables for measuring the EO variables of innovativeness, proactiveness and risk-taking. A primary reason for this absence of measurement in the literature is the difficulty in finding data which accurately provides a proxy for the variable(s) under study. A secondary issue contributing to the continued use of a single methodological approach has been the consistent acceptance of this type of measure in journal publications, thus providing a sense of security for researchers in this area.

Another issue related to the consistency in scale usage for EO measurement is the inherent limitations of and questions surrounding self-response data. This is an issue which is prevalent in a majority of the studies examining EO given the previously discussed popularity of the MCS scale. This scale utilizes Likert scale measures for all independent variables and is often complemented by the use of Likert scale measures for the dependent variable(s). The obvious issue is that of common method bias. While most studies surveyed the CEO or other leader of an organization, the continuous dependence on this sole source of data by numerous authors leaves much to be desired in the quality of data being analyzed in EO research. This issue again can be partially addressed by the use of secondary measures of both independent and dependent variables to achieve triangulation, as discussed previously.

6.2.3 Risk-taking Variable Issues

A major issue of discussion from this analysis is the ambiguity surrounding the measurement and utilization of the risk-taking variable of EO. Past research has criticized the use of risk-taking as a component of EO (e.g., Kreiser et al., 2002). However, while the overarching issue is whether or not risk-taking should be included in analyzing the level of entrepreneurial orientation in an organization, the two underlying questions which must be answered first is 1) whether or not past research has accurately tested and reported the importance of the risk-taking variable, and 2) whether the theoretical support for the inclusion of this variable in the entrepreneurial orientation construct is valid.

Given the dominant use of the MCS scale for measuring the risk-taking variable, we should begin by examining the accuracy of this scale in providing a clear picture of the impact of risk-taking on firm performance. An analysis of this scale reveals a major issue which could be at the heart of previously reported conflicting results and the theoretical debate which has emerged in recent years. As previously discussed in the hypothesis development chapter, past entrepreneurship literature has found entrepreneurs to be characterized by moderate levels of risk-taking (e.g., McClelland, 1961). This finding is in contrast to the commonly held belief that entrepreneurs are extreme risk-takers, which has been an assumption that many people place on entrepreneurs or entrepreneurial organizations (Byers et al., 1997).

In EO research, the problem with the measurement of the risk-taking variable does not lie in the MCS scale itself, but in the methods of calculation utilized by researchers applying this approach for measurement. A common approach when utilizing this scale has been to measure each of the three EO dimensions and subsequently calculate an EO score, which is intended to represent the true entrepreneurial nature of a firm. This was the case in all but seventeen of the manuscripts analyzed (EO only) in the current meta-analytic study. In calculating an EO score, the vast majority of researchers using this approach have simply summed the Likert-scale scores of the three variables (i.e., innovativeness, proactiveness and risk-taking). However, by following this method of calculation, the researcher is assuming that the optimal (or highest) level of EO is achieved when there is a high level of innovation, a high level of proactiveness, and a high level of risk-taking present in a

firm. This calculation procedure is problematic given previous findings of the risk behavior of entrepreneurs and/or entrepreneurial firms have shown moderate levels of risk to be present in organizations with the highest levels of entrepreneurial behavior. Thus, the application of this procedure could greatly impact the accuracy of a measurement intended to capture the extent in which an organization is entrepreneurial.

While some authors have been quick to dismiss the risk-taking variable as a contributor to the entrepreneurial orientation of an organization (e.g., Kreiser et al., 2002), it seems that first correcting the measurement technique would be a more appropriate, and responsible, step. While there are many possible ways to approach this issue, research would suggest the correct calculation procedure for EO would be to label a firm to be highest in entrepreneurial orientation when that firm is characterized by high levels of innovation, high levels of proactiveness and a moderate level of risk-taking. If this is, in fact, the case, slight discrepancies can be found in the majority of research manuscripts utilizing a unidimensional measurement approach of EO.

To address this issue, future EO research should consider an alternative approach in calculating a firm's EO. One possible solution to this problem would be a simple adjustment in data analysis coding procedures. Likert scale responses (assuming the use of the MCS scale or some other subjective response scale measuring EO) provide a score of one to seven for the risk-taking variable. By taking an alternative approach in the data coding process, moderate levels of the risk-taking variable can be calculated as being higher on an EO scale than high levels of the risk-taking variable.

The following coding procedure is one way to take this approach: 1) Likert scale responses of 1 (very low) and 7 (very high) would be assigned a coding of “1”, 2) Likert scale responses of 2 (low) and 6 (high) would be assigned a coding of “2”, 3) Likert scale responses of 3 (moderately low) and 5 (moderately high) would be assigned a coding of “3”, and 4) a Likert scale response of 4 (moderate) would be assigned a coding of “4.” These scores would have to be standardized in order to contribute equally with those of the Likert scale values obtained from the innovativeness and proactiveness dimensions. This would enable the researcher to adequately capture the highest level of EO when a moderate level of risk-taking is present in a firm. However, for analyzing risk as a unidimensional variable, the traditional approach to Likert scale coding would be needed to enable a distinction between high and low levels of risk-taking. While this suggestion is not without limitations, it does enable a more accurate representation and measurement of the risk-taking construct when analyzing it as part of a multidimensional entrepreneurial orientation measure.

CHAPTER VII

CONTRIBUTION AND CONCLUSION

Research in the entrepreneurship field has placed an intense focus on the characteristics of high-performing entrepreneurial organizations and other variables influencing their performance. Central to this area of research has been the examination of the entrepreneurial orientation of an organization and its relationship to the performance of the firm. The current study makes several contributions to this stream of literature. First, the study provides an empirical examination of the relationship between EO and firm performance and environmental variables moderating this relationship. Further, benefiting from the meta-analytic approach used, evidence is provided in regards to the overall effect sizes of each of these relationships, rather than simply providing another single-study, single-sample contribution.

Second, the individual dimensions of EO (i.e., innovativeness, proactiveness and risk-taking) are considered in their unique relationships to firm performance, as well as the moderating influence of environmental factors on each of these three relationships. Again, results of these analyses provide definitive evidence to often controversial and debated relationships. The first two contributions of this study utilize past empirical research on EO and/or its three dimensions and seek to solidify and/or

clarify the contributions of past literature and the existence and direction of those relationships under review.

Another essential contribution of this manuscript is the questioning of the past measurement of the EO construct and the proposal of slight modifications to allow for a more accurate representation of the level of entrepreneurship within a firm. As noted above, the most widely accepted measurement of firm-level entrepreneurship is the nine-item scale developed by Miller (1983) and later modified by Covin and Slevin (1989) (See Appendix A). Two primary problems with the current use of this measurement tool are presented and addressed in the current study. First, while Miller (1983) acknowledged that moderate levels of risk-taking leading to optimal firm performance, existing EO scales fail to adjust for this need of moderate risk-taking. Thus, the highest levels of EO, per the MCS scale, are seen when firms are highly innovative, highly proactive, and have a high level of risk-taking. In reality, however, this EO measure should be highest with a high level of innovation, a high level of proactiveness and a moderate level of risk is present in the firm. One way to address this issue would be to introduce new data analyses and coding procedures, as were presented previously.

A second problem with the existing measurement of EO is the assumption of equal contributions from innovativeness, proactiveness and risk-taking to a firm's EO. The current study proposes the use of a weighted measurement of the EO construct based on the unique contributions of each of the three variables. Thus, I agree with

Miller (1983) and Covin et al. (2006) that all three of these characteristics must be present in a firm for a firm to be considered entrepreneurial. However, to assume, or require, that each of these variables be equally present in an entrepreneurial firm would be incorrect, especially after evidence has consistently shown the three components of EO to be uniquely related to dependent variables of measure. Using the dataset developed from past empirical EO literature, the contributions of each of the three dimensions of EO are assessed in relation to an overall EO construct and in relation to firm performance. Further, a description of a methodological approach for carrying out a weighted unidimensional measure of EO is provided. An approach such as this satisfies both the theoretical arguments for a unidimensional construct of EO and empirical findings supporting a multidimensional measure where variables can contribute at varying levels.

The importance of each of these contributions to entrepreneurship literature is evident given the past state of the field. Over fifteen years of literature have now been built on the MCS EO scale. While this scale is clearly useful, it is its interpretation and utilization which the current study suggests should be altered for future entrepreneurship research. By considering moderate risk levels as optimal and the varying contribution of EO dimensions to an overall construct, the accuracy of EO literature can be further fine-tuned, thus providing greater elucidation and precision of the construct. Further, attention should be given to the validity of the three variable components of EO (as presented by the MCS scale) as more recent research has suggested possible alterations to its measurement.

I feel there are several primary areas of contribution stemming from this study which will be significantly appealing to researchers in the entrepreneurship field. The first of these would be the meta-analysis portion of this study, which would present the results of the synthesized model of the EO-performance relationship and the various moderating variables considered in previous research. Given the often contradictory findings produced in past literature, this meta-analytic perspective will provide clarity in the field and a foundation for the future progression of EO literature.

A second major contribution of this analysis is the theoretical development and empirical testing of a weighted measurement of the entrepreneurial orientation construct. As discussed above, this is a construct which requires the presence of all three entrepreneurship variables (i.e., innovativeness, proactiveness and risk-taking). While the established necessity of the required presence of these variables is not called into question, I do suggest these variables to not have to have equal contribution or representation in a given firm for that firm to be considered entrepreneurial. Thus, varying levels of each dimension could be representative of different types of entrepreneurial organizations. This further brings up a discussion of the level of analysis at which these measures are intended, but this discussion will be addressed further after empirical testing. Again, a study addressing the weighted contribution of these variables is central to EO literature and should be of much interest to entrepreneurship researchers and thus, the journals publishing this literature.

The third segment of this study is the analysis of the risk-taking dimension and its measurement in EO literature. Again, this directly addressed the measurement of the EO construct. While this study could be included in the same analysis as that of the weighted-dimensions of EO, there is a distinct difference between the contribution of each dimension and the possible errors in the interpretation of the EO construct in the literature. Thus, I feel it is essential to accentuate the importance of the accurate consideration of moderate levels of risk-taking as being indicative of the most entrepreneurial organizations.

A fourth contribution of the study is the innovative approach to the testing of moderator variables in meta-analysis. Given this study presented a unique set of circumstances related to the types of moderators examined in the past and testable in the current study, a new approach to moderation testing in meta-analysis was developed utilizing the calculated partial correlations. This new procedure is a significant contribution to the meta-analysis methodology as it enables the testing of moderating influences which were previously not testable.

Finally, the post-hoc analyses conducted provide interesting insight into the EO construct while also revealing several opportunities for future research in this stream of literature. Analyses enabled examination based on the type of measure used, the quality of study being investigated, the size of the firms being analyzed, the use of international or domestic samples, and the industry of the firms. These analyses contribute to future

research by providing empirical evidence for areas in need of future research, as were detailed previously.

Each of these contributions serves to greatly enhance the EO stream of literature. Theoretical and empirical clarity are desperately needed as the debates which plagued this field ten years ago still plague it today. A fresh approach that avoids the bias of past research will be extremely useful and influential in such a setting.

In conclusion, this dissertation has provided some insight into the current state of research in the area of entrepreneurial orientation. Further, several ideas for future study have surfaced which should be mentioned.

Given the extensive exposure to various areas of entrepreneurship literature as a result of the methodological approach used, several issues of primary concern in entrepreneurship research were identified. The first of these major issues is the level of analysis in which studies are focused. Several other authors have hinted at this problem (e.g., Lumpkin & Dess, 1996). However, researchers have primarily failed to recognize, or at least acknowledge, the level of analysis issues that are present in the past thirty years of entrepreneurship literature as the ambiguity that was present years ago continues to be an issue. Past literature has used many different populations or population levels to discuss/measure entrepreneurship. As a result, entrepreneurship has been viewed in many ways, such as innovation, corporate entrepreneurship (Pinchot, 1983; Stevenson & Jarillo, 1990; Stopford & Baden-Fuller, 1994), small business, new market entry (Lumpkin & Dess, 1996), new venture creation

(Schumpeter, 1934; McClelland, 1961; Vesper, 1980), opportunity recognition (Venkataraman, 1997; Shane & Venkataraman, 2000; Eckhardt & Shane, 2003), and opportunity exploitation and capitalization (Hitt et al., 2001).

As Lumpkin and Dess (1996) noted, the level of analysis is an important issue when utilizing the EO construct. As a result, we must clarify between the many different ideas, or measurements, of entrepreneurship to get consistent, interpretable, and meaningful findings. To accomplish this greater level of clarity in the entrepreneurship field, entrepreneurship research must be segmented into particular types of entrepreneurship, rather than using the overarching term of “entrepreneurship” to describe all different types and levels of entrepreneurship. If this can be achieved, the field will be able to progress with greater credibility and legitimacy.

One way to achieve this would be the creation of a typology of entrepreneurship that categorizes the various entrepreneurial approaches in business. Such a distinction could classify entrepreneurship approaches as start-up entrepreneurship, corporate-level entrepreneurship, and entrepreneurial characteristics of individuals. It is important for researchers to make a clear distinction between those entrepreneurial attributes of individuals and those of the firm. Another approach would be to identify the level at which each study is being examined. Such a distinction in the literature would greatly enhance the clarity of the various areas of entrepreneurship research.

An issue that is closely related to that of the level of analysis is the possibility of transition the transition of a firm from being entrepreneurial to being non-

entrepreneurial, at least by classification. This is a loophole of entrepreneurship research that has not yet been discussed, yet presents a major problem when assumptions are made of certain startup organizations. For example, by almost every definition of entrepreneurship, a startup venture would be labeled as an action of “entrepreneurship,” and rightly so. However, the assumption that these startup firms are “entrepreneurial” (i.e., they are innovative, proactive and risk-taking) is often misguided.

As an example, consider an individual who opens a coffee shop in an area where this service is in high demand. The initial action of identifying the need and servicing that need (i.e., proactiveness) is certainly entrepreneurial. However, once the firm is established, while concurrently gaining a first-mover advantage along with brand recognition, the owner could easily regress from any entrepreneurial behavior and focus on more traditional (and likely conservative) business practices. Thus, while this is certainly an entrepreneurial venture, to label the firm as being “entrepreneurial” would be in conflict with many definitions of entrepreneurship. The ramifications of this misguided categorization of these firms as being entrepreneurial can have a major impact on empirical research in the entrepreneurship arena. For instance, many researchers utilize databases, such as CorpTech, which provide data on startup or early stage businesses. While much of this research is examining businesses at these levels, other research has assumed these businesses are inherently entrepreneurial based on their new venture status.

As discussed above, this assumption can be misleading and can only be overcome by a more focused categorization of the different types of entrepreneurship. Given the dilemmas previously mentioned, the continued use of a single term for “entrepreneurship” only further complicates research in entrepreneurship streams and will lead to long-term confusion of concepts. Additionally, this possible issue is further evidence of the need for longitudinal research in this stream of research. By testing the entrepreneurial action of firms over time, research can reveal whether or not a firm is only showing a spike in entrepreneurial practice or if the entrepreneurial characteristics being viewed are actual strategic (and consistent) practices within the firm. Once this type of testing is available, a further typology of entrepreneurial firms could be created, categorizing firms based on their propensity to act entrepreneurial in a longitudinal fashion or only in situations that require their firm to act in an innovative, proactive or risk-taking manner.

APPENDIX A

ORIGINAL ENTREPRENEURSHIP SCALE

Original ENTRESCALE Questions

How many new lines of products or services has your firm marketed in the past 5 years?

- | | | |
|--|---------------|---|
| a. No new lines of products or services | 1 2 3 4 5 6 7 | Very many new lines of products or services |
| b. Changes in products or service lines have been mostly of a minor nature | 1 2 3 4 5 6 7 | Changes in products or service lines have usually been quite dramatic |

In general, the top managers of my firm favor . . .

- | | | |
|---|---------------|--|
| A strong emphasis on the marketing of tried and true products or services | 1 2 3 4 5 6 7 | A strong emphasis on R& D, technological leadership, and innovations |
|---|---------------|--|

In dealing with its competitors, my firm . . .

- | | | |
|---|---------------|--|
| Typically responds to actions which competitors initiate | 1 2 3 4 5 6 7 | Typically initiates actions which competitors then respond to |
| Is very seldom the first business to introduce new products/services, administrative techniques, operating technologies, etc. | 1 2 3 4 5 6 7 | Is very often the first business to introduce new products/services administrative techniques, operating technologies etc. |
| Typically seeks to avoid competitive clashes, preferring a "live-and-let-live" posture | 1 2 3 4 5 6 7 | Typically adopts a very competitive "undo-the-competitors" posture |

In general, the top managers of my firm . . .

- | | | |
|--|---------------|---|
| Have a strong proclivity for low-risk projects (with normal and certain rates of return) | 1 2 3 4 5 6 7 | Have a strong proclivity for high-risk projects (with chances of very high returns) |
|--|---------------|---|

In general, the top managers of my firm . . .

Believe that, owing to the nature of the environment, it is best to explore it gradually via careful, incremental behavior

1 2 3 4 5 6 7

Believe that, owing to the nature of the environment, bold, wide-ranging acts are necessary to achieve the firm's objectives

When confronted with decision-making situations involving uncertainty, my firm . . .

Typically adopts a cautious, "wait-and-see" posture in order to minimize the probability of making costly decisions.

1 2 3 4 5 6 7

Typically adopts a bold, aggressive posture in order to maximize the probability of exploiting potential opportunities.

APPENDIX B

LIST OF ARTICLES IN META-ANALYSIS

Year	Author	Journal
2001	Atuahene-Gima & Ko	Organization Science
1998	Barrett & Weinstein	ETP
2005	Barrett, Balloun & Weinstein	International Journal of Nonprofit and Voluntary Sector Marketing
1995	Barringer	Unpublished Dissertation
1999	Barringer & Bluedorn	SMJ
1997	Becher & Maurer	ETP
1999	Becherer & Maurer	JSBM
2005	Bhuiyan, Menguc & Bell	JBR
1996	Brown	Unpublished Dissertation
2003	Calantone, Garcia & Droge	Journal of Product Innovation Management
2002	Caruana, Ewing & Ramaseshan	The Service Industries Journal
1998	Chadwick	Unpublished Dissertation
2006	Chow	SAM Advanced Management Journal
2004	Colton	Unpublished Dissertation
1988	Covin & Slevin	Journal of Management Studies
2006	Covin, Green & Slevin	ETP
1994	Covin, Slevin & Schultz	Journal of Management Studies
2004	Crockett	Unpublished Dissertation
2003	Culhane	Unpublished Dissertation
2005	De Clercq, Sapienza & Crijns	Small Business Economics
1997	Dess, Lumpkin & Covin	SMJ
1997	Dickson & Weaver	AMJ

2004	Dimitratos, Lioukas & Carter	International Business Review
2005	Fox	Unpublished Dissertation
2002	Frese, Brantjes & Hoorn	Journal of Developmental Entrepreneurship
2001	George, Wood & Kahn	Entrepreneurship & Regional Development
2003	Gibbons & O'Conner	Journal of Enterprising Culture
2002	Hayton	Unpublished Dissertation
2004	Hult, Hurley & Knight	Industrial Marketing Management
2003	Hult, Snow & Kandemir	Journal of Management
2005	Jantunen, Puumalainen, Saarenketo, & Kylaheiko	Journal of International Entrepreneurship
2005	Kaya & Seyrek	Journal of American Academy of Business
2002	Kemelgor	Entrepreneurship & Regional Development
1997	Knight	The International Executive
2005	Krauss, Frese, Friedrich & Unger	European Journal of Work and Organizational Psychology
2004	Kreiser	Unpublished Dissertation
2006	Kropp, Lindsay & Shoham	International Marketing Review
2001	Lee, Lee & Pennings	SMJ
2001	Li	Journal of High Technology Management Research
2005	Li	Asia Pacific Journal of Management
2006	Li, Liu & Zhao	Industrial Marketing Management
2005	Li, Zhang & Chan	Journal of High Technology Management Research
1996	Lumpkin	Unpublished Dissertation
2001	Lumpkin & Dess	JBV
2005	Luo, Sivakumar & Liu	Journal of the Academy of Marketing Science
2005	Luo, Zhou & Liu	Journal of Business Research
2005	Manev, Gyoshev & Manolova	International Journal of Entrepreneurship and Innovation Management
2002	Marino, Strandholm, Steensma & Weaver	ETP
2002	Matsuno, Mentzer & Ozsomer	Journal of Marketing

1986	Miller & Toulouse	Management Science
2005	Monsen	Unpublished Dissertation
1993	Naman & Slevin	SMJ
2006	Poon, Ainuddin, & Junit	International Small Business Journal
2003	Qian & Li	SMJ
2004	Richard, Barnett, Dwyer & Chadwick	AMJ
2004	Santos	Unpublished Dissertation
2000	Slater & Narver	JBR
1994	Smart & Conant	Journal of Applied Business Research
2004	Sorenson	Unpublished Dissertation
2000	Stetz, Howell, Stewart, Blair & Fottler	FER
2003	Swierczek & Ha	Journal of Enterprising Culture
2005	Tan & Tan	SMJ
2005	Tan, Luo & Shenkar	International Journal of Entrepreneurship and Innovation Management
2006	Unknown	Unpublished
1989	Vankatraman	Management Science
2006	Wei	Unpublished Dissertation
1999	Wiklund	ETP
2003	Wiklund & Shepherd	SMJ
2005	Wiklund & Shepherd	JBV
2006	Wolff & Pett	Journal of Small Business Management
2001	Yoo	FER
2002	Yusuf	
1991	Zahra	JBV
1996	Zahra	AMJ
1993	Zahra & Covin	SMJ
2000	Zahra & Garvis	JBV
1998	Zahra & Neubaum	Journal of Developmental Entrepreneurship
2000	Zahra, Neubaum & Huse	JOM
2005	Zheng, Yim & Tse	Journal of Marketing

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- * indicates study was included in Meta Analysis

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